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EX CATHEDRÂ.

A New Year's Greeting. We cannot more fittingly commence a new century, a new year, and a new volume than by cordially wishing all Friends and Readers of the Journal a Happy and Prosperous New Year. Behind this old, familiar formula lies the sincere wish of a full heart. The Editor of The British Journal of Photography is necessarily brought, the year through, into close personal relations with thousands of his readers, amongst whom he has the pride of numbering innumerable warm friends. It is to these, as to all, that his greetings are addressed. Photography generally is flourishing, and if happiness, the most difficult of all things to obtain or bestow, is dependent upon prosperity, it is our hope that all who read these lines may participate in the latter blessing, and that other and pre-eminent one, without which all else is not worth the having—Good Health!

The Camera Club. We are pleased to learn that Mr. H. H. O'Farrell, the Acting Honorary Secretary of the Camera Club, is receiving such excellent support in the performance of the arduous duties he has recently taken over, that a capital list of papers for the winter and spring months is in process of arrangement. We append the January fixtures:—Thursday, 3rd, Mr. James Cadett: "Exposure Meters." Monday, 7th, Mr. Max Henry Ferrars: "Photography as applied to the Portrayal of National Character," with lantern slides illustrating the life of the Burmese. Thursday, 10th, Mr. C. H. Bothamley, F.C.S.: (1) "A Note on Imogen, a new Developer," with illustrations; (2) "Norman Castles in England," with lantern slides. Monday, 14th, Mr. H. M. Lomas: "Stag Hunting with the Camera." Thursday, 17th, Mr. Ignace Herbst: "Photogravure, and its Progress in England." Monday, 21st: Discussion and Exhibition of Photographic Novelties. Monday, 28th: Members' Lantern Evening. Thursday, 31st, Mr. A. W. Rimington: "Photography from a Painter's Stand." Thursday, 24th, Mr. T. C. Hepworth: "Some Yorkshire Caves and Waterfalls." Here we have a good selection of subjects in the hands of first-rate men, so that the meetings of the Club in the newly-opened year promise to be as interesting as in the past. As a photographic centre the Camera Club is in no danger of falling behind the times. Mr. O'Farrell was one of its most prominent members in the eighties, and he has only to receive, as he assuredly will, the loyal support of his colleagues to achieve a distinct administrative success in his new position.

* * *

Ilford, Limited. We are asked to announce that "The Britannia Works Company, Limited, will henceforth be known as Ilford, Limited, in order that the connection between the Company and its productions, which have been known all over the world as Ilford photographic goods for some twenty-two years, may be made clearer and more distinct." The Company, to our thinking, acts wisely in taking this step. In the mouths of photographers these many years past the phrases "Ilford plates" and the "Ilford Company"

have been familiar as household words, and the association of the two terms, now definitely made, should prevent the intrusion of any future misapprehension on the point. From this date we also note that some alteration is to be made in the appearance of a familiar friend, "Photographic Scraps," which greets the century in a new cover and a new type. The articles in "Scraps" are always practical and to the point, and we have pleasure in quoting one of them in our SUPPLEMENT this week, which deals with "Photo-micrography without a microscope," a subject recommended to the notice of our readers in our Correspondence columns a few weeks ago.

* * *

A "Tanquerey" Warning. Dr. Anderson, head of the Criminal Investigation Department, New Scotland Yard, London, has issued a series of cautions to the public, designed to guard persons against the attentions of the various bands of swindlers and depredators who thrive by dishonest practices, of which, apparently, it is so easy to make innumerable members of the community the remunerative victims. There are some interesting kinds of criminality on Dr. Anderson's list. The common house thief may gain admission to your dwelling on various innocent-looking pretexts. Swindling jewellers may worm themselves into the good graces of your domestic servants, whose vanity will be punished by the discovery that they have bought flash trinkets at exorbitant prices. Of an even more alluring nature is the "gold-brick swindle," a stale, but still successful, plot in which the alleged discovery of the precious metal some thousands of miles away is used as the bait to catch some foolish and credulous persons with more money than common sense. Dr. Anderson remarks, "The Paris Free Portrait Swindle is again in full force." It is, indeed, as these pages and our correspondents very frequently remind us. The warning from which we have quoted is printed in many newspapers and made public in other ways, so that it cannot be said the Scotland Yard authorities have neglected their duty in this matter. It is due to Dr. Anderson to remark that this is not the first time that he has sought to put people on their guard against the methods of Tanquerey. On one occasion he issued a special warning, and gave details of Tanquerey's modus operandi. But still Tanquerey flourishes, and his dupes seem to be more numerous than ever! It is weary work trying to extirpate folly, cupidity, and ignorance from business transactions, which call, in their due performance, for the exercise only of a little—a very little—common sense!

* * *

Evanescent Star Photographs. Some little time ago we described the unfortunate condition into which some negatives of the great star-atlas series had fallen. Many of the smaller magnitude stars had absolutely disappeared from the plates, and it was feared that others would follow. Sir William Crookes, having heard of the catastrophe, kindly offered to endeavour to find a method for bringing back the images, and he has been quite successful. The plates he treated had had the star images they contained counted, and after Sir William's treatment the missing numbers all had reappeared as shown by a recounting. The method adopted was virtually that of redevelopment and gold toning of the reproduced image. The first treatment consisted in a three hours' soaking in distilled water. The plate was then placed in the dark in an ordinary pyro-soda developer for ten to fifteen minutes, and afterwards well washed. After this a half-hour's immersion in a 15 per cent. hypo solution was given, and the plate washed in running water for three hours. The plate was brought to a good colour by an acid, alum, and sulphate of iron bath, and washed for six hours. The final process consisted in toning the plate by a sulphocyanide gold bath of ordinary strength, i.e., about a grain of gold to eight ounces of solution and six or seven grains of sulphocyanide to each grain of gold. The net result of the whole question was, as stated, a complete success, and Sir Wm. Crookes in his letter made the suggestion that it would be advantageous to employ the clearing solution and sulphocyanide and gold toning to all negatives taken under ordinary conditions.

LENSES FOR ENLARGING.

WHAT is the best lens for enlarging from small negatives? is a question that is often to be answered in the Correspondence columns, and our foreign contemporary, the "Photographische Chronik," has similar queries put to it, as we noted recently. Our contemporary recommends, as the best for the purpose, one or other of the modern anastigmats, and, undoubtedly, they are the best for the work. They have a flat field, are free from astigmatism, and the field is more evenly illumined to the corners than it is with any other form of lens. But these lenses are not possessed by every one, nor is it likely that they will be until their price is more within the reach of those with limited purses. Now, setting aside these costly instruments, which are the next best to employ?

For many years before the advent of these new lenses perfect enlargements—in every respect—were being produced, and are still being produced, without their aid. Indeed, we are inclined to doubt very much if the leading firms of enlargers in their general work employ them at all.

It is very often said that the lens with which the original negative was taken is suitable for enlarging from it. So it may be, and in some cases it is the best that can be used, in others just the reverse. We will give an example. Supposing the original were a negative of a building, and it was taken with a single lens, the lines at the margins will be curved—"barrel-shape distortion." By employing the same lens for the enlargement, with the stop towards the enlargement, this curvature will be greatly ameliorated, because the lines will still be distorted, but in the reverse way—"pincushion distortion." Indeed, if a lens of a similar type, but of shorter focus than that with which the original was taken, be used, and the position of its stop slightly modified, if found necessary, the distortion existing in the original may be perfectly remedied in the enlargement. It will now be seen that a lens, though faulty, with which the original was taken, may be the very best for its enlargement, whereas one which is rectilinear would reproduce the distortion in its entirety.

On the other hand, there are cases, and they are in the majority, in which the lenses with which the negatives were taken are by no means the best for their enlargement. In all lenses of the older forms there is always a falling off in

the illumination towards the edges of the field. In lenses of the wide-angle class, when they are used to their full covering power, this is very marked. So it is with the Petzval form of portrait lens. It is, however, less apparent in those of the R.R. type, for with them the field is more uniformly illumined. Now, if any lens which shows a marked falling off of light towards the margins of the negative be employed for its enlargement, it will be obvious that this want of even illumination will be accentuated, inasmuch as the lens will once more show its unequal lighting properties at the margins, and thus render the defect still more pronounced in the enlarged picture. As we have just said, this falling off of light is more pronounced in lenses of the wide-angle and Petzval type than it is in those of the R.R. form. It does, however, exist in them, though in a minor degree.

Let us now consider this form of lens. We all know that with it, to cover the size plate it is intended for, and get all portions of the image sharply defined to the edges of the plate, and all planes in focus, it must be considerably stopped down. If with this same lens we have to make the enlargement, it has again to be stopped down to retain the sharpness of the original and also to obtain a sufficiently flat field. This, of course, entails a prolonged exposure. It must be kept in mind that in enlarging we have a flat surface to deal with on another flat surface—the enlargement—and it is in this matter that anastigmatic lenses are so much superior to all other forms. But we have assumed that such lenses are not available, and that brings us to the point, Which is the next best for our present purpose?

This query is answered by those of the R.R. type. They are free from distortion and have fairly even illumination over a pretty wide area, and they are the ones that are most commonly used by professional enlargers who produce the best work. But the lens used should be of much larger focus than the one employed for taking the negative. A well-corrected R.R. lens, say, for the 10 × 8 size, will cover a half-plate with crisp definition up to the edges of the plate with its full aperture. If we use such an instrument for enlarging from it, we have the field, for that size, practically evenly illuminated, to all intents and purposes, flat, and quite free from astigmatism over that area. Hence such a lens for our present purpose becomes, practically, as good as one of the more costly anastigmats.

What has been said with reference to lenses of the R.R. type applies also, though in a minor degree, to those of the Petzval form if they are proportionately long focus. Most of the enlarging lanterns are fitted with portrait lenses. Those supplied for enlarging from quarter-plate negatives are usually fitted with quarter-plate lenses of short focus, but they would be much better, so far as results are concerned, if they were of considerably longer focus, for the reason just pointed out. The centre of the field of a Petzval portrait lens is fairly free from astigmatism, and the illumination is also tolerably even over a limited area, and is fairly flat.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

IV. Wilhelm Zenker.

It is of importance to see how far Zenker was indebted to his predecessors, and chiefly, for a reason given in an early one of these Notes,* to Edmond Becquerel. I have already given elsewhere† a very full account of Dr. Zenker's *Lehrbuch der Photochromie* (1868), so here I shall only briefly sketch out the matter, and emphasise certain points which seem to be essential. Later I hope to consider Zenker's theory in an aspect more logical than (as here) psychological, and to attempt a sifting of the features in it which must be permanent in photochromy from what is transient and logically unnecessary (although perhaps these *logical* unnecessities may have been very important or needful *hewristically*).

Zenker‡ divided the theories which professed to explain, or rather to make plausible, the identity of colours proved by Becquerel.§ First are those which attempted to reduce the phenomenon to *chemical* processes, reduction and oxidation (Seebeck,‖ Herschel, and Poitevin¶). Zenker rightly pointed out the insufficiency of this for an explanation of the colour appearances, and went further, by showing that the explanation is at fault even with the views of Goethe—which views might at first seem to indicate that Seebeck's view was a real explanation.

Secondly, among what might be distinguished as *physical* explanations, Zenker remarked that the non-variability** of the impressed colour is opposed to the explanation of a "thin-plate' effect at the surface.††

Becquerel's view‡‡ was stated at the end of his first communication on photochromy: "Could it not be that light, beginning to act chemically on certain substances, communicates to them its own colours, and that later chemical variations modify this first action.' Later, Becquerel, gave an hypothesis which Zenker characterised as only a special case of the above one. He imagined the molecules to be set in vibration by the incident light waves, and the molecules inversely return the same colours afterwards, just as only notes of the same tone as a certain cord is when struck will set in vibration.§§

On this Zenker well remarks that a whole system of arbitrary hypothesis lies in this supposition, which one must throw aside as soon as one sees a way to solve the problem without it.‖‖

In fact, Becquerel's view cannot in any way be regarded as an *explanation*, by which we mean, and only can mean, the deduction of the phenomenon from facts or hypotheses already known. Becquerel simply removes the difficulty to another point by imagining a *new* property of molecules (which we may call the property of "concordant vibration") which, besides the fact that it does not *in reality* make our conception of the photochromatic phenomenon any clearer,¶¶ it apparently serves no other useful purpose in physics or chemistry.

It seems, then, incontestable that Zenker was not led to his theory by a *development* of Becquerel's ideas; that a sentence in Becquerel's

* Namely, M. Lippmann's statement that Zenker only developed the ideas of Becquerel.

† *Camera Obscura* Août, Septembre, Novembre, 1899, and Février, 1900; all in vol. i. The references are to the *pages* in this volume.

‡ *Lehrbuch*, pp. 69–88; *Cam. Obsc.*, i. 114–116.

§ *Ann. de Chim. et Phys.* (3), xlii., 97; *Lehrbuch*, 69–71.

‖ *Lehrbuch*, 71–73; *Cam. Obsc.*, 114, 115.

¶ *Lehrbuch*, 71–73; *Cam. Obsc.*, 115, 116.

** [Practical invariability.]

†† [This view is also refuted by the comparative accuracy of the colour rendering, as photographic action is, of course, not a function (mathematically speaking) of the colour alone. It would not be worth while to make this remark if it were not that some people (owing, possibly, to failures experienced in working Lippmann's process) have a tendency still towards this view.

‡‡ *Lehrbuch*, pp. 76, 77.

§§ Cf. The British Journal of Photography, Nov. 2, 1900, p. 694, for a quotation from Becquerel's *La Lumière . .*, in which this hypothesis is again put forward.

‖‖ "Jeder Lichtstrahl soll verschieden auf die empfindliche Schicht wirken, aber ihm wird zugleich vorgeschrieben, welcher Art diese Verschiedenheit sein soll. Hierin liegt ein ganzes System willkührlicher Hypothesen, die man jedenfalls fallen lassen muss, sobald sich ein Weg zeigt, das fragliche Problem ohne sie zu lösen."

¶¶ There is, at first, an *apparent* increase of clearness arising from the impression that we have gone a little further behind the scenes. This appearance, however, vanishes when we reflect that we cannot be sure that we *must* ascribe this new property to molecules; we are not forced to it as a logical consequence of exact *description*. And an hypothesis which has not a descriptive basis lies wholly outside the legitimate bounds of science. All science is essentially descriptive; a view which was recognised in a fashion by Galileo and Newton, much later emphasised by Mach and Kirchhoff among the mathematicians and physicists, and, recently with great success by Professor Ward, of Cambridge, among the philosophers.

work may have started him on a train of thought which led to the conception of his theory * is possible though exceedingly doubtful, as Zenker does not mention Becquerel's book, in which alone such a sentence might occur. † We might conclude, then, as Zenker gave very full references, that he was not acquainted with *La Lumière*.

As a consequence of this general conclusion, we must consider Zenker's theory, as he published it, as a wholly independent creation. If I am right, ‡ he arrived at it by a descriptive mental picture of the light waves entering and leaving a Becquerel film. He relied solely on the elementary doctrines of the undulatory theory of light, and made no arbitrary hypothesis on the motion of the molecules of the silver salt, &c. But, in his manner of presentation, one would say immediately that in the way in which he speaks of undulations, for example, he rests on hypotheses—hypotheses which will not necessarily be present if we pin our faith to another theory of light, say the electro-magnetic one; in short, not on *facts*.

This is true in a sense, Zenker, like most discoverers, formed for himself a mental picture which included several unessentials, by which "what goes on" appeared clearer to him. In this Zenker showed himself to be a non-mathematician; but this does not necessarily disqualify a man from being a great natural inquirer. Is it necessary to recall the fact that Faraday was almost wholly ignorant of mathematics? Zenker was a lesser Faraday. Zenker was without the powerful imagination and originality—freedom from prejudice in scientific matters—of Faraday; Zenker did not, like Faraday, *create* an image-instrument for investigation which, symbolless, could accomplish much of what mathematics could in his case; but he *used* an instrument already made with great intelligence, and consequently with important results, and thus left an excellent example—which was, and still more *is*, needed for photographic investigators.

However, the fact that Zenker's mental picture is open to criticism, does not necessarily affect the correctness of the deductions he made therefrom; indeed the justification of the "Faraday methods" in science lies precisely in the fact that, in competent hands, the discoveries to which they lead in thought are found to coincide with the results of experiment. The reason of this is, of course, that the parts of the image which are open to criticism are the unessential parts—parts which do not, or need not, appear in the equations which state the suppositions from which one starts. The function of these unessentials, is to enable us to form a clear mental picture of the occurrences; but there must always be something arbitrary about them, and for the complete description of the occurrences they are not required; hence we call them unessentials. The case with Zenker is that the unessentials do not affect the validity of his deductions. By this he shows great clear-headedness and a (perhaps only instinctive) perception of the value and limitations of his mental images or guiding hypotheses.

We must not, by any means, conclude from this that Zenker was perfectly clear himself as to the nature of his guiding hypothesis;§ I have purposely intercalated the words "perhaps only *instinctive*." We have the advantage over Zenker, in that we have only to analyse and criticise his work, not to do it over again, and are thus in a position to draw general conclusions as to his method which he perhaps never thought of. Zenker attained *his* end; it remains for us to analyse and criticise his work *as a necessary preliminary to fresh advances*.

We are, thus, to examine the foundations on which Zenker's theory rests; when we meet with anything unessential, we must cast it and the conclusions (if any) drawn from it aside, and finally state the Zenker theory in its essential form. We shall find, I think, that part of the "theory" is a fact, established as firmly as the undulatory theory itself; and we will, I hope, agree that the rest has been established by direct experiment.

PHILIP E. B. JOURDAIN.

Cambridge, December 29, 1900.

* That is to say, Becquerel's views had really no connexion with Zenker's. A stray sentence may often give rise to a train of thought which has no connexion in inner meaning with the thoughts of the person uttering the sentence.

† See THE BRITISH JOURNAL OF PHOTOGRAPHY, November 2, 1900, p. 694.

‡ *Cf. Cam. Obsc.*, i. p. 116.

§ Indeed it appears (from his statements without qualification about light "waves," and from the intermixture of essential and unessential), that Zenker attached value to the guiding hypothesis *in itself*.

ON THE PERMANENCY OF TONED BROMIDE PRINTS.

HERR GAEDICKE contributes to Liesegang's *Photographischer Almanach* an important article upon the above subject, which confirms a fairly general impression, and a translation of his notes may be not without practical interest.

The toning of bromide prints in all possible colours has lately been frequently described and recommended without, so far as he could find, any direct experiments being made as to the permanency of the same.

As the toning methods depend as a whole upon the formation of metallic ferrocyanide, an alteration in exposure to light was not improbable, since it was well known that cloth dyed with Berlin blue faded when exposed to sunlight, whilst in the folds the dark colour remained. If such a cloth was hung in a dark wardrobe, the colour reappeared with its original hue during the night.

Experiments were now made with the compounds which are formed in these toning processes, and the results are noteworthy, though the subject is by no means exhausted.

A raw paper was first placed in ferrous sulphate solution and then in a solution of red prussiate of potash. The precipitate of Turnbull's blue gave the paper an intense colour. After washing and drying, the paper was exposed in a printing frame to the light, underneath stencils cut from brown paper in the form of a cross, &c. After a short time the cross showed bright on a dark ground, but recovered its dark colour as soon as it had been kept for a short time in a dark place. Thus was confirmed the old assumption.

The tones which are formed on bromide paper were now tested. For this purpose bromide paper was under-exposed and faintly developed with adurol, so that the paper was uniformly covered with a grey tint. After fixing, washing, and drying, the paper was cut into small pieces and used for further experiments.

One piece was toned to blue with a mixture of ammonium ferric oxalate, potassium ferridcyanide and glacial acetic acid, then washed and dried. Under a stencil the cut-out figure bleached very strongly with five minutes' exposure to the sun, but when kept in the dark was still faintly visible three weeks after exposure, although it had nearly attained its original colour. In every case the bleaching process took place much more slowly in gelatine than when the colour was in the paper without a binding vehicle.

A grey print was now toned with a mixture of uranium nitrate, potassium ferridcyanide, and glacial acetic acid, to a red. The paper became considerably darker under the stencil. The colour became indeed paler in the dark, but was still visible three weeks after exposure.

A print toned with uranium was placed in the blue toning bath, and became a greenish-grey. Under the stencil a red image appeared in the light, whilst the overlying blue readily bleached. In a few weeks in the dark the image had disappeared.

Another grey sheet was toned with copper in a bath of water 100 parts, copper sulphate 1 part, potassium citrate 9 parts, and 1 part of potassium ferridcyanide. The toning was carried to the intense red stage, and the result gave very quickly a fairly dark image of the stencil, which, however, disappeared when kept in the dark and in as short a time as with the other papers. The red copper and the blue toning are thus more prone to change when exposed to light, and it is not too much to say that the colour comes back again when kept in the dark. In any case, there remains in the picture a light sensitive silver compound, the presence of which ought not to be ignored.

LIGHT FILTERS.*

THIS work, however, was without practical result until 1873, when the problem was considerably simplified by Vogel's discovery of colour sensitisers. With the aid of the principle enunciated by Vogel, Ducos du Hauron obtained the first favourable results in trichromatic printing. He used orange, blue, and violet glass as light filters, and formulated his well-known theory of three-colour printing, "that the printing ink must be complementary to the corresponding filter."

This statement was attacked by many, more especially by H. W. Vogel, and is only correct with certain limitations, viz.:—

1. The use of a panchromatic process.
2. Perfectly transparent printing inks.

* Concluded from p. 824, vol. xlvii.

3. The expression "complementary colour" must be understood as meaning that which is necessary to complete the spectrum, or, in other words, the white light, resulting from the union of the two colours complementary to each other, must yield a continuous spectrum by decomposition.

These conditions were not then fulfilled. The process was merely panchromatic, the printing inks were impure, and the term "complementary colour" was loosely defined. Vogel made these defects, and the imperfections of the filters which were then used, the ground of his attack. In 1885 he enunciated a new principle as a better basis for three-colour printing,[1] from which reference to the filters is entirely omitted. This was as follows: "The printing inks in their relation to the spectrum must exactly agree with the sensitisers."

Hübl made the following correction in the second half of the statement: "Must exactly agree with the respective sensitised silver haloids." But the proposition expressed in this manner still remains only approximately true, especially if we consider the three processes as they are generally used (red, green, and blue sensitive plates). It may be confidently said that the division of the photographic process into three, which for a considerable time was inevitable, has contributed largely to the widespread confusion of ideas concerning the nature of colour selection. The general adoption of a single panchromatic process (as, for instance, the use of spectrum plates and compensating filters) would elucidate considerably the questions which still remain in suspense.

In the case of a panchromatic process there is no overwhelming reason for preferring Young's colour triad in the selection of the filters. Theoretically, an infinite number of colour triads are possible for the purpose. Moreover, on practical grounds, there have been frequent deviations from Young's triad. But in the present state of perfection of colour synthesis experience teaches that the best practical results are obtained by adopting Young's system. We shall therefore adopt it as the basis of our own remarks, and likewise the results of our predecessors, who have also worked upon the Young system. "Maxwell, Ducos du Hauron, v. Bezold, Ives," &c.

In 1888 we meet with an important rule for determining the properties of filters for three-colour selection according to Young's theory. Ives[2] postulates that the curves of opacity of the three negatives must agree with the curves of the corresponding primary colour sensations. These curves differ a little for various observers, and have been thoroughly investigated by Helmholtz, Maxwell, Koenig, Abney, and others. Ives's principle must therefore be restricted to the mean curve deduced from the colour sensations of a large number of persons of normal sight. Small deviations from these curves, of course, will always be unavoidable in practice, but they are not of very much importance. Ives therefore selects his filters and times his exposures,[3] so that the negatives conform as nearly as possible to this principle. The results Ives has obtained in this way are surprising, and appear to confirm completely the correctness of his principles. Ives uses a process panchromatically as correct as possible. He appears to have included the necessary factor of compensation in the selective filters, so that their properties can only be tested by photographic means. Optically, their colour qualities are different. I think it more expedient to keep selective filters distinct from those which are used for compensation. The selective filters must be tested by means of an apparatus for colour mixture to ascertain their correctness for the colour sensation values. Fig. 6 shows the process of three-colour selection with filters of this kind.

The curves R, G, and B correspond to reddish-orange, green, and blue-violet selective filters, and agree with Young's curves of colour sensation. $x\,y$ is the curve of a modern panchromatic dry plate. C_4 is the correct compensation filter for the same. In the extreme red we see the small red error, which is generally present in commercial dry plates, but it is unimportant in practice. The dotted lines complete the actinic curve by addition of the ordinates. Like the preceding examples, this figure is purely schematic. The following table shows the colours of the selective filters and the corresponding colour syntheses:

The colour scheme for additive methods should be as homogeneous and intense as possible. For the subtractive methods, on the other hand, the colour scheme should be as nearly complementary as possible, and therefore composed of mixed colours.

Selective Filter.	Additive Colour Scheme.	Subtractive Colour Scheme.
Reddish orange	Red, about 630 $\mu\mu$	Pale blue
Green	Green, ,, 525 $\mu\mu$	Purple
Blue-violet ...	Blue, ,, 450 $\mu\mu$	Yellow

As homogeneous colours can very seldom be used in practice for additive synthesis, we are generally compelled to select mixed colours, which, however, should reproduce as purely as possible the shades of the primary colour scheme. However, such mixed colour schemes will always give much whiter colours in synthesis than homogeneous light. In fig. 7, homogeneous red, green, and blue light are represented by the thick vertical lines, and the mixed colours, which are generally used for the additive synthesis, by the dotted curves. (Ives's projection filters.)

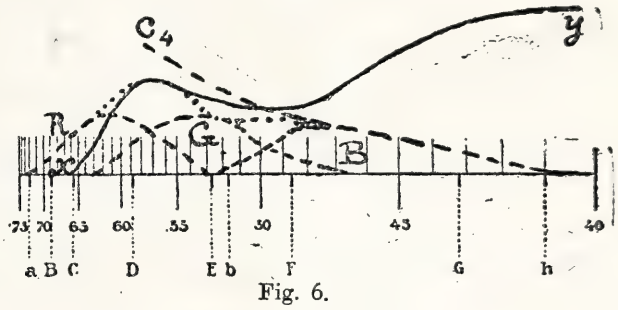


Fig. 6.

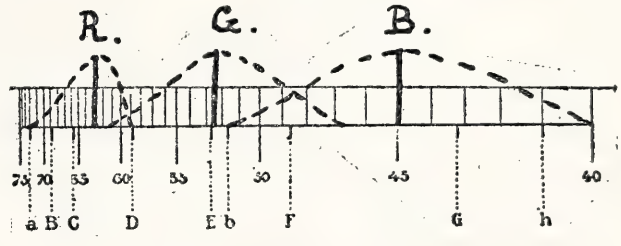


Fig. 7.

The properties of selective filters can, of course, only be determined for constant conditions. The meaning of panchromatism is not absolute. It varies with the subjective sensation of colour brightness within rather wide limits, according to the absolute intensity of the light (Purkinje).[4] The process is also liable to variations due to difficulties of manufacture, according to the sensitiveness of perception of different observers. We have already mentioned that the compensating filter, the quality of the illuminant, and the period of exposure are of much importance. If all three factors are selected in due relation to each other for a single process, the defects might be so minimised that they would no longer be felt in practice. With three constant normal selective filters, and a normal process, &c., a safe basis might be found for all kinds of three-colour work. At present, however, there is frequently much difficulty in obtaining suitable colours for the synthesis, and one is compelled under such circumstances to make a compromise in the process of selection. It should be remembered, however, that colour manufacturers will soon be able to overcome these difficulties completely. Three kinds of glass have been found of suitable normal colours, in relation to the spectrum, for subtractive synthesis (by normal selection), and I have used them for the manufacture of a subtractive three-colour glass spectrum. These glasses are:—

1. Deep gold ruby glass;
2. Deep uranium glass;
3. Deep oxide of copper glass.

(Experimental samples produced at Jena.)

The conditions to be fulfilled by the selective filters are frequently expressed in a proposition of very general application—"Each of the three separate negatives must cut off two colours, and transmit the third."

This proposition has the merit of great simplicity, and is very valuable in ordinary practice.

1 H. W. Vogel, "Phot. Farbiger Gegenstande," Berlin, 1885, p. 135.
2 "British Journal of Photography," 1888 and 1889, p. 218; Eder's "Jahrbuch," p. 410.
3 The period of exposure is of great importance, but it can be determined by well-known methods.
4 This is why the selective action varies considerably in the direct colour half-tone process with collodion emulsion and screens. The period of exposure in this case is very much increased, as the process dots are the result of over-exposure.

Up to this point we have confined our remarks to three-colour selection, or filters.

Ducos du Hauron's[5] process of two-colour selection may be mentioned, in passing, as a curiosity. Scott[6] tried four-colour selection for additive synthesis in 1891. Eder[7] also drew attention to a similar process, based upon Hering's theory of sensation. These processes have hitherto been obstructed by the difficulty in obtaining suitable combinations of coloured inks for the synthesis. There is no theoretical objection in the way of a process based on any number of colours, but the bands of the colours used in the synthesis must be smaller in proportion to the number of primary colours. Three-colour synthesis is, however, already troublesome enough, on account of the bands being too broad.

There is no advantage in multiplying the number of primary colours. We may congratulate ourselves that in practice they are reduced to three.

Testing the Properties of Light Filters.

The testing of the light filter may vary according to the purpose for which it is intended.

The spectrographic method is the most practical and exact. The photographic action of a light filter in relation to any process may be determined in this way, likewise the purely optical effect, if a panchromatic process be used (spectrum plate and yellow screen, for instance). The writer always uses Cadett's Spectrum plates, with compensating filter, for his tests. The small error in the red may be neglected in practice (fig. 6). The exposures are made with a wedge-shaped slit as a guide to the comparative intensity. Other methods of testing light filters are used, and we may mention Lovibond's tintometer (British Journal of Photography, 1895, p. 712) and Abney's colour sensitometers.

Abney's first sensitometer consisted of a series of coloured glasses, and the second of a series of pigments upon discs. ("Photo. Journ.," 1900, p. 121.)

The photographing of colour charts is a method widely used, and a large number of charts have been constructed and circulated for the purpose. The following have come under my notice:—

H. W. Vogel, in the "Lehrbuch."

Cassell's colour chart, "Popular Educator," The British Journal of Photography, 1895, p. 23.

Hay's colour chart, "Process Photogram."

Warburg's colour chart, "Process Yearbook," 1899, p. 13.

Hübl, "Dreifarbenphotographie."

Sanger Shepherd, "Process Year Book," 1899, p. 13.

Fischer and Wittich, Eder's "Jahrbuch," 1896, pp. 587-588.

J. Mayer, Eder's "Jahrbuch," 1896, pp. 587-588.

E. Kreutzer, Eder's "Jahrbuch," 1896, pp. 587-588.

Prang, Eder's "Jahrbuch," 1899, p. 616.

Cellarius, Eder's 'Jahrbuch," 1897, p. 484.

Steinheil, "La Reproduction des Couleurs." Eder's "Jahrbuch," 1897, p. 484.

Harber's "Transparente, combinirbare Farbscala." Eder's "Jahrbuch," 1897, p. 484.

Schulz. "Transparente Scala. "Eder's "Jahrbuch," 1899, p. 617.

A large number of older colour charts for the purpose of studying the theory of colour are well known. The transparent three-colour spectrum made by the writer, of three kinds of glass is very convenient for tests of this kind.

The Technics of Light Filters.

With regard to the technics of light filters, they are very different, according to the special purposes for which they are required. In the positive processes coloured matt varnishes are used for lowering the action of light, also yellowish or greenish-yellow glasses. Yellow and red pigments are also applied locally, or otherwise.

In the negative processes the position of the filter is varied in the following manner:—

1. Position of filter behind the object (micro-photography). Instead of filtering the light emitted by the illuminant, direct coloured light is occasionally used, and in special cases it is combined with monochromatic filters. The spectrum may be used as a direct source of coloured light by cutting off the desired zone with a stop. (Count Castracane[8] and Piffard[9] used the region of the D line for correction of focal difference. Gifford[10] also gives some information concerning this method).[11]

Some kinds of Geissler tubes (hydrogen, mercury, &c.), the lines of which may in some measure easily be isolated by the aid of monochromatic filters,[12] are also employed.

The sodium flame, combined with a yellow filter,[13] gives homogeneous light, and other alkalies and alkaline earths have been used extensively. For particulars of the Lippich sodium light filter and the spectral purity of the sodium flame, see Landolt: "Das Optische Drehvermögen," second ed., p. 353 to 378.

Petroleum light was suggested by Schumann[14] in 1885 as a compensation filter. In reality, all sources of light are more or less coloured. Even sunlight, according to recent researches, is not quite white, but slightly reddish.

Flash lights with alkalies and alkaline earths, likewise metals, and especially the salts of copper, have been used in photo-micrography.[15] In closing the list we may mention pyrotechnic compounds, Bengal lights, &c.

Arc lamp carbons giving a yellow light may also now be had commercially. In using filters behind the object the perfect admission of the light is of less importance, especially when there is no need for economy, but if the light has to be directed with great exactitude a plane-parallel, optically homogeneous filter must be used. For unimportant purposes a flask filled with a coloured solution answers very well. The quantity of light absorbed is not determined by the size, but by the thickness of the filter. (Neuhauss, l.c. p. 58.)

2. Position of filter in front of the object.—In practice the object is seldom lighted from in front with filtered or direct coloured light. Eder is oposed to this method.[16]

3. Position of filter in the field.—Immediately in front of the object. The light has to traverse the filter twice. Of no practical importance.

4. Position of filter in the field, immediately in front of the objective. A very useful method. The filter should be optically perfect, so that the quality of the image may remain unimpaired.[17] With the filter in the field the distance between the lens and the object is increased, and it is necessary to focus with the filter in situ.

5. Position of filter in the diaphragm of doublet lenses.—This position is very generally used, but cannot be recommended for precise work, as the separation of the lenses is reduced by the introduction of a refractive medium, which sometimes affects the efficiency of the objective.

This method was recommended by Lohse[18] in 1888, and in the same year Jaffé[19] made a mechanical arrangement for inserting the filter in the diaphragm. Filters in rotating and sliding diaphragms have been made and recommended by Falleur[20] for their convenience. Abney[21] recommends cover-glasses coated with stained collodion for use in the diaphragm. (See Eder's "Jahrbuch," vol. viii. p. 485.)

6. Combined lens and light filter.—An orthochromatic objective of this kind was used by Harrison[22] as early as 1855.

In 1894 Burchett[23] recommended the use of stained Canada balsam for cementing the lens. Dallmeyer thought the idea worth considering commercially. Rodenstock[24] advertised bistigmats with yellow glasses. Kämpfer's[25] spherical light filters also belong to this class.

7. Polychromatic filters in various positions.—Pinhole filters, so called, have been recommended as a means of compensation, the centre of the filter being perforated for the admission of white light.[26] J. Rheinberg[27] has used various coloured filters for producing contrast in micro-photography. The compound regulating screen patented by W.

5 Eder's "Jahrbuch," 1897, p. 342.
6 "British Journal of Photography," 1891, pp. 25, 325.
7 Lecture, January 22, 1896. See "Phot. Cor.," 1898, p. 221.
8 Nuovi Lincei, vol. xvii., 1864, March 6. Also Neuhauss, "Microphotographie."
9 A Suggested Improvement in the Correction of Lenses for Photo-micrography ("Amer. Journ. Med. Science," vol. cvi., 1893, p. 23.
10 "Journal of the Royal Microscopical Society," 1894, p. 164.
11 Kohler, "Zeitscher. fur Wiss. Mikroskopie, vol. xvi. p. 1.
12 "Fabry and Perot, C.R.," 1899, p. 1056; "Zeitschrift fur Phys. Chemie," 1899, part I., p. 169; Eder's "Jahrbuch," 1900, p. 520.
13 Proposed by Gadeke as a dark-room lamp. Eder's "Jahrbuch," 1889, p. 89.
14 Eder's "Jahrbuch," 1887, p. 311.
15 Newcomb, Rohmann, and Galewsky, Eder's "Jahrbuch," 1892, p. 252.
16 Eder's "Jahrbuch," 1896, p. 580.
17 Edward and Handcock, Improved Screen-holders, Eng. patent No. 3290, 1897.
18 Eder's "Jahrbuch," 1888, p. 361.
19 Eder's "Jahrbuch," 1888, p. 473.
20 Eder's "Jahrbuch," 1896, p. 362.
21 Eder's "Jahrbuch," 1896, p. 361.
22 Eder's "Jahrbuch," 1897, p. 300.
23 Eng. Patent No. 24,487, May 19, 1894, "British J. of P.," 1894, pp. 67, 415.
24 "Photographische Rundschau," 1900, p. 37.
25 "Archiv fur Wiss. Phot.," 1899, p. 25.
26 Gifford, Eder's "Jahrbuch," 1896, p. 174.
27 On an addition to the methods of Microscopical Research, by a new way of optically producing Colour Contrast between an Object and its background, or between definite parts of the object itself. "Journ. Roy. Micro. Society," 1896, p. 374.

Donough[28] in England serves a similar purpose. Triple stops of different colours have also been proposed for colour selection.[29]

8. Filters behind the Objective.—For this position it is also essential that the filters should be optically worked, so that the quality of the image may not suffer. By placing the filter in the path of the image the back focus is reduced, and it is necessary to focus through the filter. This position is preferred for filters affected by the action of light, as they are protected by the camera.

Screen-holders for this purpose may be obtained commercially through Penrose[30] and others. Subtractive filter combinations have also been used simultaneously in front of and behind the lens (Burchett's combined screens[31]). Small cover-glasses coloured on both sides have also been used in the diaphragm slot (Gifford).[32] Under any circumstances it is preferable to place filters liable to fade behind the lens.

9. Filter in front of the plate.—This method was recommended many years ago by Schumann.[33] Small faults in the homogeneity of the filter are of less importance in this position than in the vicinity of the objective, because the deviation of the rays is less. Weissenberger[34] has recommended it for selection, and Cellarius[35] manufactures filter cells of this kind commercially. These filters are used in the dark slide, similarly to ruled screens. Dunmore[36] has also made the novel suggestion of coating the plate with stained collodion. The polychromatic ruled screens for the Joly[37] process are also used in contact with the film (selective party-coloured screen). The colours correspond to those of ordinary selective filters. Ruled screens of this description are also used in the McDonough,[38] Brasseur and Sampolo,[39] and the International Colour Photo. Co. processes.[40]

10. Use of the film as filter.—This modification has only been used occasionally, and the undesirable screen action of stained plates has generally been resorted to for the purpose. Dr. E. Albert[41] used picrates for staining his collodion emulsion films. Vidal[42] has used stained gelatine plates. Burton, Aristo, and Pike[43], and latterly Smith, of Zürich, have also used the same method. Eder[44] is of opinion that this modification is not very advantageous. When using additive combinations of filters (changing screens) care should be taken that the size of the image is not affected. If the various media employed have different refractive indices, the correct thickness, D, may be found by the following equation:—

$$D = \frac{const.}{n}$$

With regard to the composition of the filters, they may be divided into three classes: gaseous, fluid, and dry filters.

1. Gaseous filters have seldom been used. Cornu employed fumes of bromine in spectral photography. Other coloured gases may be used in thick layers (enclosed in glass tubes with sealed ends).

2. Fluid filters are very useful. Numerous forms of receptacles, flasks, hollow lenses, cuvettes, &c., have been proposed, according to the position in which the filter has to be employed. If used before or behind the lens the sides should be plane parallel and optically true. Landolt's filter flasks, which are very good for some purposes, are only plane parallel for the outer surfaces. Fritsch, Klönne and Müller, Steinheil, Warmbrunn, and C. Zeiss supply good cuvettes. The usual separation between the sides of a cuvette is 10 mm. For less important purposes two pieces of plate glass, separated by an indiarubber ring or piece of indiarubber tubing, may be used.

3. Dry filters may be prepared in many different ways. Plates of glass coated with stained collodion are generally used. For precise work the glass should be homogeneous and plane parallel, and the collodion structureless. For the selection of a suitable collodion for structureless filters, see THE BRITISH JOURNAL OF PHOTOGRAPHY, 1896, p. 722. Various additions are recommended for the purpose, such as ether,[45] amyl acetate,[46] &c. In selecting the dye, not only the colour, but also the solubility, must be considered. If too much is used the dye sometimes crystallises out. The plates should be coated with the collodion, as in the wet-collodion process. If the plates are stripped, thin coloured films can be obtained, which are very suitable for many purposes. Ives[47] has prepared stained films by floating a ring on mercury, and pouring collodion into the enclosed space. A cover-glass cemented to the film is of service for preserving fugitive colours from the oxidising action of the air. Various subtractive combinations may be made by cementing different colour filters together. The preparation of stained gelatine films is also very common. Dyestuffs soluble in alcohol are used for the preparation of collodion, but those soluble in water may be used with gelatine. For obtaining a very even film, the flat glass plate is levelled, the same as in the manufacture of dry plates. The addition of a little acetic acid is said to be of service. The gelatine may be coated upon the glass, and subsequently stained, by immersion in one or more baths, after setting. For less important work, a fixed commercial dry plate suffices.[48] Good serviceable stained films for various purposes may be obtained by stripping gelatine plates prepared in this way. The optical properties are improved by cementing cover-glasses to the films, and we strongly recommend it. Coloured varnishes have also been proposed in place of collodion and gelatine. Edwards[49] uses aniline blue as a stain for micro-photography. Stained matt varnishes are frequently used in printing processes. Lainer[50] uses fuchsin, eosine, aurantia, and asphalt; E. Vogel[51] chinolin yellow. Special attention should be paid to the solubility of the dyestuff. A long list of dyed fabrics, papers, &c., have been used for studio and dark-room illumination. Thick stained glass, of optically homogeneous quality, would be very valuable on account of its stability of colour and great convenience, but it is very difficult, if not impossible, to obtain of suitable quality in regard to colour. We also draw attention to the investigations made by the following writers concerning the properties of coloured glass:—Becquerel,[52] concerning the properties of absorption of the two kinds of coloured glass in common use. (See H. W. Vogel's Spectral analysis of earthy substances). Eder and Valenta[53] have also examined a series of experimental samples by means of the spectroscope. I hope to have the opportunity, on a future occasion, of giving an account of the very exhaustive examination I have made of some samples of coloured glass made at Jena.

DR. GREBE, Jena.

28 "British Journal of Photography," 1896, p. 551.
29 "Process Work," 1896, pp. 155, 195; 1897, pp. 3, 4, 24, 131; "Photo. Archiv," 1890, p. 250; Eder's "Jahrbuch," 1897, p. 487.
30 "Process Year Book," 1898, p. 68.
31 "British Journal of Photography," 1894, p. 67.
32 "Photo Journal," 1895.
33 Eder's "Jahrbuch," 1891, p. 459.
34 "Process Year Book, 1898, p. 68.
35 Eder's "Jahrbuch," 1900, pp. 551, 680.
36 "British Journal of Photography," 1894, p. 409.
37 "British Journal of Photography," 1895, p. 600. For the preparation of screens of this kind, see "British Journal of Photography," 1897, p. 11; ib., 1900, p. 118. Eder's "Jahrbuch," 1897, p. 485. German patent granted to Otto N. Witt. Liesegang's application for patent No. 13,105. "Process Photogram," 1897, p. 76. American Patent 578,147, &c.
38 "British Journal of Photography," 1896, p. 522.
39 "British Journal of Photography," 1897, p. 217.
40 "British Journal Almanac," 1900, p. 853.
41 "Eder's "Jahrbuch," 1889, p. 405; 1891, p. 460.
42 "Moniteur de la Photographie," 1891, p. 163.
43 Eder's "Jahrbuch," 1894, p. 378.
44 Eder's "Jahrbuch," 1892, p. 393.

GUM-BICHROMATE PRINTING.

Notes of a communication by Dr. Caspar W. Miller, made at the October Meeting of the Photographic Society of Philadelphia.

DR. MILLER proposed a modification of the gum-bichromate process, in which the gum is rendered partially insoluble before exposure, thus permitting the paper to be coated with the pigmented gum, dried, and then, at any future time, sensitised by immersing in a solution of potassium bichromate. This plan has the obvious advantage that the paper may be prepared ahead and kept on hand ready to print, except for the simple and quick operation of dipping. It also permits of the paper being coated and sold commercially, which would be a convenience to many amateurs. The process proposed was as follows:—

Stock Solution A.

Water	100	c. c.
Best gum arabic	35	grammes.
Salicylic acid	0.25	gramme.

The above are dissolved with frequent stirring, and without the aid of heat. This solution keeps in a closed bottle several months, and always acts like a fresh gum solution. It may advantageously be used in the ordinary gum process instead of making up a fresh solution every time paper is to be coated.

Stock Solution B.

Chrome alum	3	grammes.
Water	100	c. c.

45 Selle, Patent application, No. 11,956.
46 "British Journal of Photography," 1892, July 22.
47 "British Journal of Photography," 1899, p. 198.
48 Vidal, "Brit. J. of Photo., 1898, p. 255; Hubl, id., 1899, p. 676.
49 Eder's "Jahrbuch," 1896, p. 303.
50 Eder's "Jahrbuch," 1892, p. 223.
51 Eder's "Jahrbuch," 1896, p. 534.
52 Ann. de Chimie et de Physique, 1843, vol. ix.; Eder's "Handbuch," i. p. 269.
53 "Denkschrift der Math., Nat. Classe," vol. lxi., 1894.

This solution also keeps indefinitely. To make the coating solution take, for example :—

A	10 c. c.
B	1 c. c.
Water	1 c. c.
Carbon black	0.1 gramme.

Grind thoroughly in a mortar, and coat the paper as usual. The grinding should be continued not less than five minutes, because the black does not mix readily with the gum and water, and if the separate particles of colour are not individually embedded in and surrounded by the gum they will be driven by the pressure of the brush into the texture of the paper and more or less indelible staining will result, as would also be the case were we to use too little gum. After coating, the paper is allowed to become perfectly dry, when from the action of the chrome alum the film will be found almost insoluble in cold water. The paper so prepared will keep indefinitely or may be sensitised at once. This is done by soaking for a couple of minutes in a 5 per cent. solution of potassium bichromate, C.P. If the previous drying of the paper has not been perfect, the pigment will partially dissolve off in the sensitising bath, but if properly prepared the coating will remain intact. It is, however, extremely tender when wet, so that care must be taken not to touch it with the fingers until it has again dried.

In printing give a long exposure, say from five to fifteen minutes in direct sunlight, and wash in cold water until all bichromate has been removed. The coating then may have become sufficiently tender to be developed by a soft camel's-hair brush, or even by the simple friction of the water passing to and fro over the print as the tray is rocked. On the other hand, it may be necessary to continue the soaking for an hour or more, or even to use hot water before the desired tenderness is produced. This all depends on the exposure and the amount of chrome alum used. While the quantity given in the above formula is correct for the particular pigment specified, it will not necessarily be the best proportion to use with other colours. The object is always to use the least possible amount that will give the necessary resistance to the sensitising bath. If so much be used that the film becomes really insoluble, we cannot get pure whites, for the reason that those gum-surrounded particles which find their way into the meshes of the paper cannot be removed even by a brush until the gum envelope surrounding them and gluing them in has softened. The following may serve as illustrations of the variations which the proportions of the coating solution may undergo. Charcoal is capable of rendering excellent results where bold, rough effects are desired. Mealed charcoal is shaken through a wire-cloth screen of two hundred meshes to the inch. The fine powder so obtained is ground up in a mortar in the following proportions :—

A	10 c. c.
B	2 c. c.
Water	2 c. c.
Charcoal	1 gramme.

Or again :—

A	10 c.c.
B	1 c.c.
Red chalk	0.5 gramme.

The list of colours may be extended indefinitely, but enough has been said to enable any gum-worker to prepare his own formulæ; and, after all is said, the exact proportions of the coating solution with any gum printing should depend largely upon the judgment of the operator, who knows better than any one else just what effects he is trying to produce.

In regard to the paper to be used, the only thing which it seems important to observe is that the more the sizing the greater will be the stain in the high lights; which apparent paradox is probably to be explained by the action of the chrome alum on the sizing, especially if the latter be gelatine. During the operation of coating the sizing swells under the influence of moisture, and becomes closely adherent to the pigment. Now, gelatine is far more sensitive both to chrome alum and to the hardening action of bichromate and light than is gum, hence on drying the gelatine becomes permanently insoluble, and holds the colour fast, just as the gum would do if we were to employ a very large proportion of chrome alum.

Before closing there is one other point that might be mentioned. In making use of the above process one may most conveniently coat the paper by squeegeeing it. The paper is soaked for a few minutes in water until it becomes limp, then lifted out on a plate of hard rubber or glass, pressed smoothly down with a rubber squeegee, then gotten as dry as possible with blotting-paper. This is all perfectly simple, and the paper lies so flat and firm that it can be coated with the greatest ease and certainty.

After finishing his remarks, Dr. Miller passed around a number of prints made by the process described. In the discussion which followed, Mr. Streeper said he thought that staining might be caused by the introduction of salicylic acid into the gum solution. While this would not affect carbon pigments, it would cause a stain with those containing iron, and therefore should not be used. Dr. Miller replied that he did not think any difficulty could arise from this source. The pigments used were insoluble and therefore, no action could take place. At all events, no violent discolouration such as the reaction in question would give rise to had ever been noticed, and he thought it perfectly safe to use the acid with any insoluble, inorganic pigment, and under this classification are included all pigments which, for other reasons, are at all suitable for gum printing.

PHOTOGRAPHY AS A BUSINESS.

Years ago, in the early days of the art, apparatus was expensive—that is to say, it was expensixe to every one alike; there was no Camera de Luxe for the wealthy amateur, nor was there a cheap set for a guinea for the poor but ambitious student: there was also, be it remembered, no royal road to success; no plainly marked division between the operations of exposing the plate and developing the image, and the worker who had succeeded thus far was not likely to stop short at that, but he went on and did the rest himself. It is true the man capable of producing satisfactory work under the conditions then prevailing—and some of it, in spite of certain eccentric features, such as the vase and curtain business and the cloudless landscapes—was very good—had reasonable cause to be proud of the fact, for the simple reason that his powers were taxed in every direction. It is not surprising that many amateurs who succeeded in the merely mechanical processes were led to take up the practice of photography as a profession, and thus were wise in their generation, for there was a demand for such work as they could produce, and only a limited supply. Naturally, also, there sprang up that needy and seedy race of ne'er-do-wells, that dismal fringe of poor photographers, poor in person and work—particularly work; men, probably the ill-considered recipients of cast-off apparatus, together with a small smattering of the art-science, embarked upon an unequal struggle with fortune. Then, again, it would be easy to mention men on that border line between the amateur and the professional—we have the race still with us—who made what is called a good thing out of their work: there was evidently room for them, for they were, and flourished: they were the precursors of the pure landscape men of to-day, views, local and general, being their speciality.

We know pretty well, and the interested reader can gather for himself if he takes the trouble to peruse back volumes of The British Journal of Photography, that the advent of the modern dry plate played some havoc with the older photographers; some gave up altogether, others kept on, and, although they managed to overcome some of the troubles of the dry plate, apparently have drawn the line at cloud printing, and a few of the older men have achieved fame under all the new conditions.

It was all very well in the early days the clever amateur taking up the work professionally, there was room for him, and in not a few cases he was a better man all round than his older opponent; but, if times have changed during the last five-and-twenty years in other trades and professions and conditions of labour, they have changed not less conspicuously in the profession of photography; the overcrowding in our business—this is the best word to use after all—is deplorable; not for lack of warning, for the subject has been treated of many times before. Why is it that so many men, simply because they have been able to master a few photographic processes, put themselves into a business with the chances so greatly against them? We all know the British plumber. Some of us have painful experience of his ways and methods, and a feeling that there must be a fortune in plumbing: but do we, simply because we have mastered the art of soldering, and managed to put up without leakage some of our own gas-fittings—not a job to be despised either!—make a mad rush into that most moral profession? On the contrary, having made a few observations, having watched the most noble plumber at his work, we can only arrive at the conclusion that only after years of training and initiation into certain mysteries and legends, which appear to be handed down from master to pupil, is that mental and physical condition reached which makes of plumbing the art it is. The amateur plumber or joiner would get no one to work with him, and probably no one would employ him; the amateur architect rarely gets beyond

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[THE LANTERN RECORD]

To the "British Journal of Photography." *January* 4 1901

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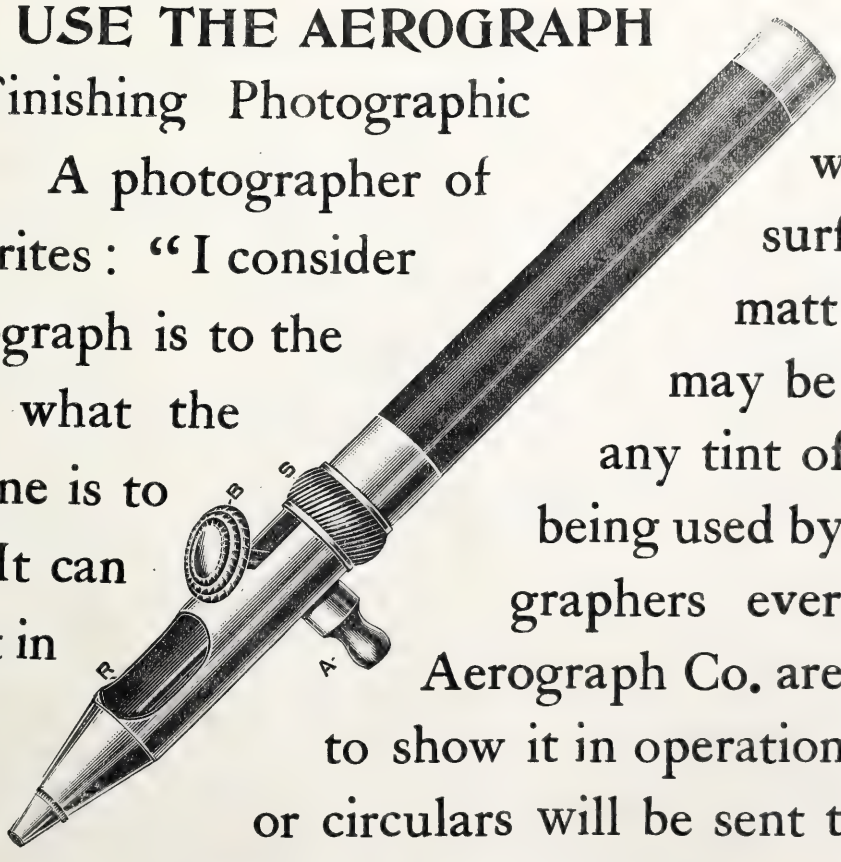
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MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

To the "British Journal of Photography." *January* 4, 1901.

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MICRO-PHOTOGRAPHS.

From beginning to end the making of micro-photographs is a most delicate operation; and a certain amount of practice is necessary before satisfactory results are obtained. Those pictures that are usually made up for pencil cases and opera glasses, the image is mounted upon a small lens, and when this is done a piece of glass is cemented upon it to protect the picture, the whole being ground down to fit the aperture that it is required for, which is a very delicate operation.

The method of making the pictures may be by ordinary collodion or collodio-albumen, and at the first offset the collodion must be absolutely free from anything like dust or any foreign matter; to any one first attempting this sort of work, the coating with the ordinary collodion is much easier than albumen.

First and foremost it is necessary to have a good 1″ micro-objective, giving a perfectly flat field, and this should be fixed into a small camera having a dark slide that will preferably hold a 3×1″ microscopic glass slip, any other size piece of glass will do; but the slips are so handy for examination under a microscope, to see if there are any defects before any final mounting or finishing off is done, and then, if not satisfactory, the glass can be cleaned and used over again.

It is almost impossible to focus so small a picture upon a piece of ground glass in the camera, and conjugate foci as well as several experimental trials will be found necessary. It is well to utilise the microscope, if possible, for the work, and when once the correct focus is obtained it can afterwards be easily got.

The small camera can be a bellows one, so that the microscopic objective can work to and fro from the plate, or it may have a hole in the front into which the objective may project, and before exposure a black cloth may be thrown over the joint. Now, to get a correct focus, we may use a mounted microscopic object, or anything that is flat (a butterfly scale is excellent), and place it in the little dark slide, and get it well illuminated by day or artificial light, and upon the other end of the microscope, after withdrawing the eye-piece, we place a very finely ground piece of glass; in fact, this glass had better be carefully ground by oneself to get a good sample, the aeriel image on clear glass may be used; now carefully focus the image of the butterfly scale upon it, and with a powerful hand magnifying glass get as much detail as you possibly can; now, by placing our negative or object at the ground-glass end of the microscope, and inserting the collodion plate in the dark slide of the little camera, and pointing the negative to the clouds, we, of course, have our minute picture; or it should be correctly focussed on the glass slip. In fact, to make things appear perhaps plainer, we simply reverse the position of things to what we should do when taking a "photo-micrograph."

If no small camera is available, to make the dark slide is perhaps the most difficult portion to adopt, but, if the following is carefully read, it may seem quite plain; it can be adapted to any size piece of glass, but perhaps for usefulness a micro-slip size (3″×1″) may be taken. Provide two pieces of good mahogany about $\frac{3}{16}$″ thick or a little thicker, and 4″×2″, and cut out as carefully as possible a space 3″ long by about $1\frac{1}{2}$″ wide and $\frac{1}{8}$″ deep, leaving a space on one end 1″ and top and bottom $\frac{3}{8}$″. Now again, in this recess already cut, cut another recess 1″×$2\frac{3}{4}$″, allowing the depth of the thickness of a piece of card or vulcanite to lay in and project at the one end, so that it may easily be taken hold of and pushed in and pulled out. Into the larger recess we must now cut a piece of mahogany that will nicely fit it, after which it may be carefully glued into its place. It will now be seen we have practically a fairly light-tight slide. We must make two of these slides. Now withdraw both slides, and, with a centre bit, drill a hole about $\frac{1}{2}$″ in size right through the pieces of mahogany exactly in the centre. With another piece of mahogany 4″×2″, cut a square in it exactly 3″×1″, and glue it to the slide that is used nearest the lens; but, before doing so, cut a groove in each corner and insert a small piece of silver wire, so that the glass slip may rest upon it, and also protect the sensitised film from coming in contact with the wood. After this has been glued, all that is necessary is to hinge the slide, so that it can be opened and shut like an ordinary slide, or it may have an indiarubber band put over each end to keep them together. Upon the inside of the slide a piece of watch-spring should be fixed, and so arranged as to press against the glass slip and prevent it from slipping about, or it may be backed up with a piece of blotting-paper that will take up any drips and moisture from the sensitising solution. The dark slide can be so adjusted in position on the microscope stage, and made fast with one or two rubber bands, during exposure.

To use the apparatus, of course, the test slide or butterfly scale must be put into the slide, both shutters drawn and focus made, as before stated, upon the ground glass; the negative which we are taking a picture from is now placed in the position occupied by the ground glass, and which is best held there by tying a strong clip of some description on to the condenser stand of the microscope, when the negative may be placed between it and placed in any position. The negative can then be illuminated by gas or daylight. Take the dark slide into the dark room, and take a glass slip, which should be of good clear glass, free from scratches, and any flaws, which may be detected by examining with a small magnifying glass, drop a drop of collodion upon the centre of the glass and drain it off, previously seeing the glass is perfectly clean. Excite this plate in a silver bath, which is hardly necessary to make mention of here, but it is best that it should contain a trace of free acid, and the bath may be a large-mouthed stoppered bottle just deep enough for the glass slip to go in to the bottom and project at one end, so it can easily be taken hold of with the fingers; allow it to remain about a minute, take it out and return it once or twice, and, when the greasy look has gone, take

it out and drain in for a few seconds put it in the slide, spring the clip upon the back or pack with blotting-paper to keep it fast, shut the slide up and close the shutters, take it to the microscope stand, fix in position and cover over with a cloth of some dark material or some velvet the space between the objective glass and slide, withdraw the shutter next the lens, and expose.

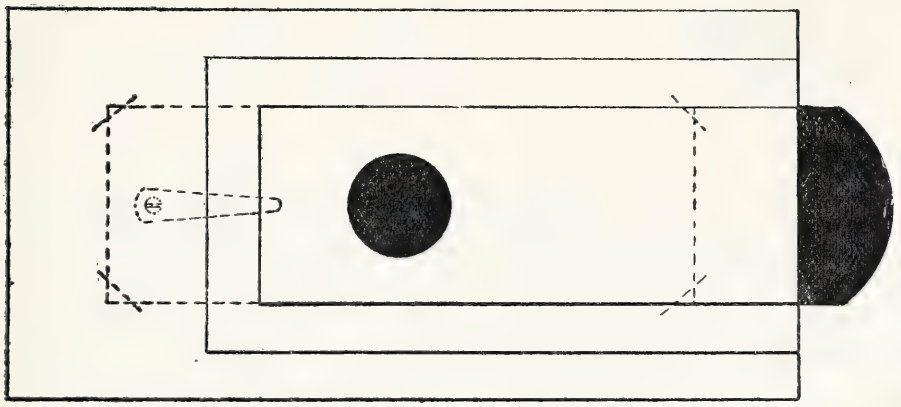
The exposure, if an artificial light is used, such as gas, an ordinary burner, and if the negative was not larger than the end of the microscope tube, would take from ten to sixty seconds or more, and really there seems but little chance of overdoing it, but by using the daylight five or ten seconds will usually be found ample; after the exposure has been made, take the dark slide into the dark room, take out the slip, aud with a brush, or, better still, a dropping bottle, drop a drop of developer upon the centre of the slip; the developer is as follows:—

Pyrogallic acid	2 grains,
Citric acid	1 grain,
Distilled water	1 ounce,

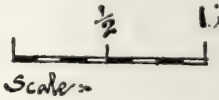
and wait till you observe a speck appear about the size of a pin's head or smaller. If you have a watchmaker's glass by you, use it during the development, use a yellow light for development, as you can see better what you are about; after the image is well out, you may fix it in an ordinary hypo solution, but use distilled water for all your solutions, and they should be filtered and put in bottles away from the ordinary photographic work. The slide must be well washed, preferably in distilled water, after fixing; if not, a rinse or two in ordinary water will not hurt, but give it its final wash in distilled and place on one side to dry. After it is dry the picture must be protected, and the best way to do this is to make the slip fairly hot over a spirit lamp and place a small drop of Canada balsam upon the picture, and then put a clean thin microscopic glass also warmed upon it, and place it upon one side to harden and get dry, when the excess of balsam may be cleaned off with a knife, and a rag moistened with turpentine.

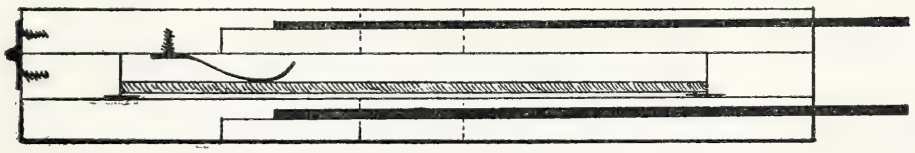
The foregoing is practically a method for making micro-photographs, and, although the microscope has been called into use to make the pictures, it is not necessary, providing you have the microscopic objective; of course, the higher the power used, the smaller the picture and the more delicate the operation. An inch will be found quite suitable, and an ordinary camera may be brought into use to hold the negative and a small camera which can hold the objective and armed with a fine focussing adjustment, the whole of the apparatus being placed upon a board, everything being central; this then allows any size

Front and End view of wood showing cut out portions.

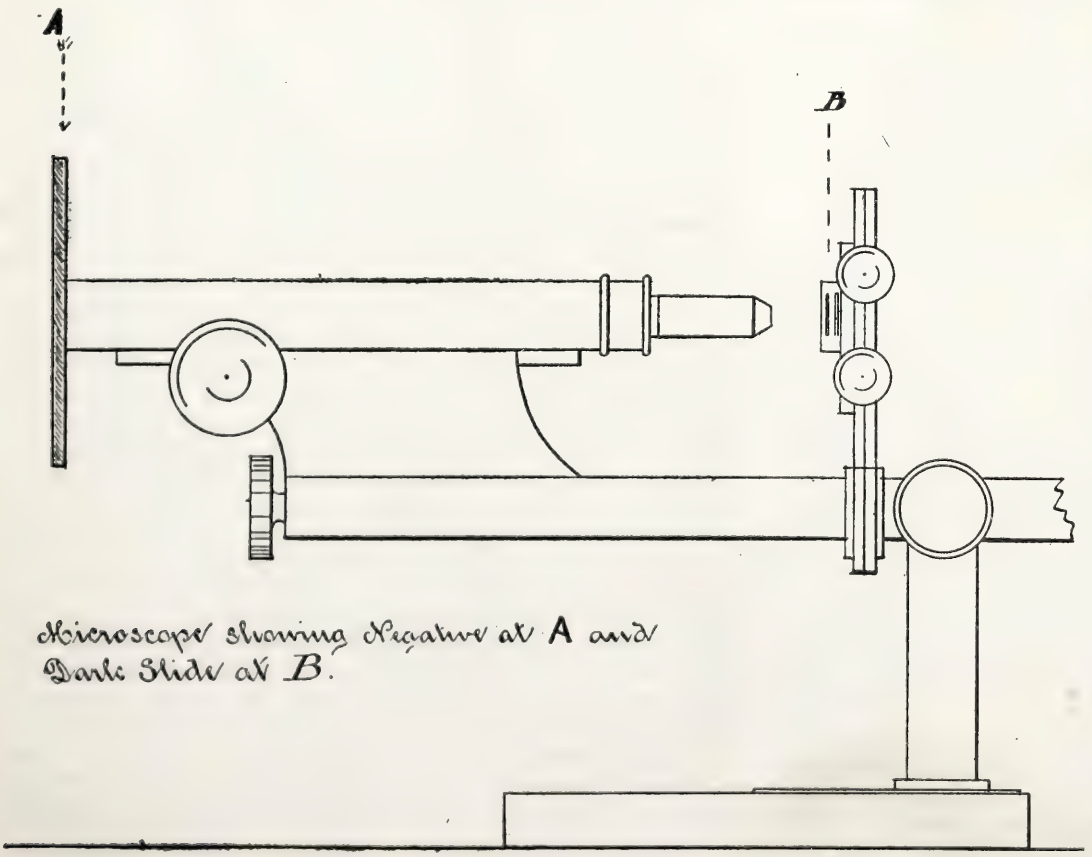








Section of slide put together complete showing Microscope glass slip in position.



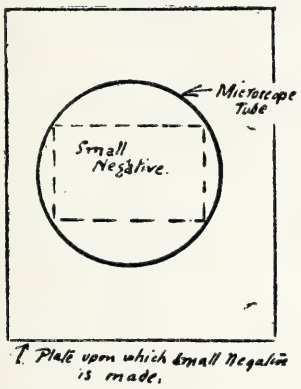
Microscope showing Negative at A and Dark Slide at B.

negative almost being used. Negatives, of course, must be worked from, and if any picture, writing, or diagram is required, a negative must first be made from it in the usual way and then photograph the negative.

In exposing the picture this is best done by covering the negative up with a velvet cloth, then removing and replacing it again, or, in using a small camera, a shutter may be utilised.

The figure showing the construction of slide is very easy to make from start to finish, and calls for no ability as a cabinet-maker.

The rough diagram of microscope simply shows the method of best using it, and, when a camera is not used and a half-plate picture is required, it will be found much easier and convenient to make a very small negative that will just go within the circle of the end of tube at A thus :—



the ocular, of course, being removed.

The work is very interesting and after a few trials all difficulties will disappear.

HARRY D. GOWER.

A NEW SYSTEM OF DEVELOPING LANTERN SLIDES.

FOR those who make many lantern slides, or work to obtain absolute perfection, the following new method of procedure will be found the acme of simplicity and certainty. It is particularly recommended to professional slide-makers and for competition and exhibition work, as it completely does away with the difficulty of estimating exposure, which has been hitherto the chief difficulty in making perfect slides, especially when only one slide is wanted from each of many varied negatives.

To overcome this difficulty I prepare two developers, one calculated to work at its best with a minimum exposure, and the other to work at its best with the very fullest exposure that would ever be likely to be given, and I work always with these two developers in two separate measures, and change the developer during the process of development to suit the exposure the plate proves to have received.

The developer which I prefer to work with is made as follows, as it is equally suitable for red or blue label lantern plates :—

A.

Hydroquinone	120 grains.
Sulphite soda	2 ozs.
Carbonate soda	2 ozs.
Carbonate potass	2 ozs.
Bromide potass	60 grains.
Water to make	20 ozs.

Dissolve the sulphite and carbonate of soda in from 10 to 15 ounces of hot water, then add the other ingredients, and then make up to 20 ounces with cold water.

B.

Bromide ammonium	1 oz.
Water to make	10 ozs.

A is the normal developer, and is used in one measure, and equal parts of A and B constitutes the special developer for use in the second measure.

The special developer made in this way needs ten times as much exposure as the other, and no one is likely to err in estimating exposure outside these limits, so that it is unnecessary by this method to waste one plate through incorrect exposure.

The method as used by me personally is as follows :—

I sort the negatives I wish to make slides from into three lots.

First—Anywhere near average density.

Second—Very thin negatives.

Third—Very dense negatives.

I expose all the first one minute at 12 inches from an ordinary No. 5 burner, the second as much less as they seem to be denser, and the third as much longer.

This division may be very roughly made, and in practice I find that it answers well to give all the very dense negatives three minutes, and all the very thin ones 20 seconds.

To develop, I place a plate in the dish and pour on the normal developer, and if the plate should happen to be correctly exposed for this developer, that is to be under rather than over-exposed, the image will grow exactly as it should do, and will be perfectly developed in about two minutes. If, however, the image appears too quickly, it is proof that the exposure is too long for the normal developer, and I at once turn this back into the first measure and pour on the special developer from No. 2 measure, when development is retarded and the resulting slide will be found to show no trace of over-exposure, and to be of a brilliancy and tone which leave nothing to be desired.

A plate that has received the minimum exposure will need to be developed throughout in the normal developer; all others will need to be transferred from normal to special as soon as the image is seen to be coming up over-exposed; the longer the exposure the sooner this point will be reached, so that a plate that has received the maximum exposure will need to be transferred to the special after a very few seconds in normal; the medium exposures will be developed about half time in each.

A very little experience will make it easy to judge when this time of changing occurs, but if an error should be made and the developer changed too soon no harm is done, as, directly the development is seen to have been checked too much, the developer can be changed back again to the normal. In fact, the whole system will be found even easier to work than to describe.

The same developer and method answers equally well for blue label plates as for red label, and in that case developing may be done in full gaslight, the exposure being made to daylight or magnesium, the proportionate exposure to equal

1 minute to gas burner at 12 inches for red label being
5 seconds to diffused daylight at window, } for blue label.
or 1 inch magnesium at 6 inches }

The tones will be colder or warmer as the plate has been developed chiefly in normal or special developer, and this is no disadvantage, but, on the contrary, a great advantage, as it enables one to obtain warm or cold tones at will from any particular negative by giving under or over normal exposure, without it being at all necessary to arrive at an exact time.

One caution I may give is this,—Do not rinse the plate between developing and fixing, nor when changing the developer, and in case of the image flashing up very quickly change the developer as promptly as possible; a very little experience makes this easy.

This method will be found very economical, as the same developers may be used over and over again until exhausted, though if used too often the tones will not be so good.

In my own practice I use 1 oz. of normal developer in the first measure, ½ oz. normal and ½ oz. bromide of ammonium solution in the second measure, and develop six slides before renewing the solutions.

AUSTIN EDWARDS.

OCCASIONAL NOTES.

BY AN OLD LANTERNIST.

"ONE hundred and twenty photographs from animal life and pastoral studies, and not one of them instantaneous." Such, in substance, was what Colonel Gale said in the introductory remarks he made at the Royal Photographic Society, when he gave his audience such an artistic treat by having projected on the screen his lantern slides, justly renowned for their pictorial beauty, excellent and varied lighting, and first-class technique. Whether the clouds were real, as regards forming part of the scene, in all cases, matters not. Some, without doubt, were taken at the same time as the rest of the subject depicted. Any way, they were all excellent, and, as Mr. J. J. Vesey said afterwards, "every slide a picture." As nearly all the photographs had figures of some kind in, and some of the animals portrayed were of a fidgety nature, the audience naturally would think they were instantaneous

photographs, but, as Colonel Gale remarked, they were not snapshots, all being from negatives taken in a stand camera, and, to a certain extent, with time exposures. It was doubly interesting to me to hear this and see such fine results in light and shade and general effect. It is evident, given patience and perseverance and a fair amount of time, "cap and uncap" photos can be successfully taken of pictures with "life" in them. The natural conclusion to come to after this is that no one with a hand camera should be without a convenient stand, so that he may, whenever the subject permits of it, secure freedom from vibration while he makes an exposure from, say, one-tenth to one-half a second. The records of hand-camera snapshots are most interesting, and certain subjects must, of course, be taken with shutters moving at a rapid rate, but this is only possible in summer time, or with good actinic light, whereas, if a little judgment is exercised, good photographs and pictures can be taken at the present time. I had shown me a few days ago some good average stereoscopic slides taken with a home-made stereoscopic hand camera used on a stand. The subject was a large institution, standing in its own grounds, and, for relief, a figure or two were in the foreground. I think the stand for hand-camera workers has yet to be invented. What is wanted is something of the walking-stick order, and, not only so as regards being reasonably small in diameter and light, but also of the proper height to use in comfort when walking, and to extend to a reasonable height when in use. The aluminium telescopic stands are very convenient and useful for carrying on a bicycle or slinging on the back, but what is most wanted is one to take the place of the walking-stick—readily brought into use and easily closed and made serviceable as an aid to walking. If we had some of the clever Japanese workmen here, we could soon get constructed in wood or papier mâché something strong, light, and useful that would fulfil these conditions.

* * *

Mr. Barton's demonstration of his improvements in jets, projection apparatus, &c., on behalf of Ross, Ltd., before the members of the Royal Microscopical Society at Hanover-square, shows how varied in design may be an optical lantern and the modifications it is possible to make in the method of enclosing the source of light, also in the construction of the apparatus for light-production. The injector jet principle and the Gwyer system of long mixing chambers have produced various jets of high-power illumination and silent working, and Mr. Barton has designed a good one of this order. Those who do not mind using a large amount of gas to obtain a good light, and this is necessary for cinematograph and the projection microscope, cannot do better than select one of this type of jet, or the large size ordinary shape mixing-box jet with alternate disc and gauze, as designed by Mr. Lewis Wright. During the evening, when showing the optical lantern, a number of "natural objects" were projected on the screen. These carried me back some years, and from certain remarks passed afterwards it appears, if not a novelty to them, they were quite a revelation to some of the audience. It brought to my mind a tinge of sadness, for I recognised the work of poor Bond, who for many years used to mount microscopic objects for the table instrument, and now and then large butterflies, beetles, moths, spiders, ferns, seaweeds, &c., on 3 in. circular or square glasses for the magic lantern. The objects were in Canada balsam between two glasses, and if not kept in the stage of the lantern too long stood the heat very well. The high-power jets of recent years are somewhat too much for them unless a heat-absorbing tank is used.

* * *

The scientific world is the poorer for the loss of such men as Bond, who has been followed somewhat recently by Amos Topping, who died suddenly in his chair—certainly at a fairly advanced age, but yet full of energy and work. Mr. F. Enoch, who finds literary work and lecturing more profitable than object-mounting, is also not much in evidence in the latter work, although his name will always be associated with mounting insects solid. Barnet, again, has never been replaced, for no one supplying objects commercially could mount diatoms so cleanly and so beautifully as he did, and it seems a thousand pities that men who have attained such excellence in a particular line should be comparatively poorly paid and seldom in affluent circumstances. If it had not been for the popular days of the microscope, when microscopic objects were sold by such men as Topping and Grosses at the time, I am afraid the latter days of these painstaking and clever men would be a sorry one. Outside Mr. Cole and one of the Normans, I do not know where to turn to get any specimens professionally mounted. When will the boom in table microscopes come on again, and other object-mounters come to the front. I wonder! If it is delayed much longer, a generation will be here that know not what beauties there are to be revealed by the microscope. By the way, I saw by a short paragraph in one of the daily papers that an old friend of mine, and one of the earliest workers in the optical lantern, has passed away. I refer to Samuel Highley. It was he who took up the lantern in earnest with a desire to improve it in design and arrange the working parts and accessory apparatus for convenience of manipulation. When I first entered the optical industry, 35 years ago, I received my first tuition in practical lantern work at Mr. Highley's hands. Biunial lanterns, portable gas-generators, safety oxygen retorts, arc lamps, and all pertaining to lantern matters were taken in hand seriously by him, and the ever-ready quill pen was designing this new part or modifying that, as customers came in with their requirements or orders had to be given to workpeople. I remember we had the gas cylinders in the old days filled by Orchard. The pressure was then 30 atmospheres, instead of 120, as now. If my late friend had only been as ready in money-making as he was with his pen and tongue, he should have made, if not a fortune, at least a respectable income. As it was, he was elected to the Brotherhood of the Charterhouse, at which institution he ended his days in comfort. I saw him a few months since after a stroke of paralysis, and, although moderately well and mentally active, he would every now and then lose the thread of his remarks or forget what a few minutes before he desired to tell one. So passes away another link, for he was closely connected with the late Professor Pepper, of the Polytechnic, and the late Charles Darker and his father, of Lambeth.

PHOTO-MICROGRAPHY WITHOUT A MICROSCOPE.*

What is really wanted is the best wide-angle lens of short focus that the operator can afford. The bijou portrait lenses that were manufactured in the early sixties by Voigtlaender according to the formulæ of Petzval, are admirably adapted in every way for the work. The focal length varies from three inches; they give perfect definition over a limited field; and, being now out of date, they may frequently be picked up very cheaply second-hand. The portrait lenses of short focus that were manufactured by Dallmeyer at about the same time are also specially suitable. Most of the principal opticians of to-day make special lenses for photo-micrography without a microscope. The Gundlach Optical Company makes a perigraphic lens of about 3½ in. focal length, which gives well-defined pictures up to 15 diameters. The firm of Zeiss has introduced an anastigmatic objective of 3 in. focus which leaves nothing to be desired. But one of the best lenses in the market for photographing small objects, with or without a microscope, is Zeiss's apochromatic projection objective of from 1½ to 2½ in. focus. It has been specially designed for making pictures of moderate magnification, and is used in the same way as an ordinary photographic lens.

Any suitable light may be used for illuminating the subject. The bull's-eye is the best form of condenser, and this should be so placed that the light is focussed upon the objective, and not on the subject. The subject is then illuminated with a converging cone of light.

To those who can afford apparatus of this description my advice is, "Get it." But, if expense is to be considered, a cheap, short-focussed portrait lens should be obtained, or an ordinary "wide angle," with the right side turned towards the focussing screen, may be used. If it be urged that this last would require an abnormally long extension to the camera, I may mention that some of my earliest work in this fascinating branch of photography was done with a good second-hand lens that cost me 3s. 6d., and with a dark room in place of a camera. My dark room was made of wood, and it was erected inside a spare room in the house. A hole was bored in the wooden partition, and to this a wooden mount was affixed, with the objective attached.

The mount was so arranged as to allow it to be adjusted in any direction for the purpose of focussing. Two tables, one on either side, were fixed close up to the partition. The outside table carried the object stand and the illuminating mirrors; the inside one had a grooved block of wood fixed to a sliding lath, and the whole was so arranged as to allow of the centre of the focussing screen or the photographic plate, which was held in the grooved block, being in exact alignment with the optic axis of the lens. After the operation of focussing had been accomplished, the photographic plate was substituted for the screen, and the exposure made.

The size of the photograph is only limited by the length of the dark room and the dimensions of the plate. But it must be borne in mind

*By J. H. C., in "Photographic Scraps" for January.

that there is a limit, beyond which definition falls off rapidly, and the result is what is technically known as a "rotten image."

The advantages of the arrangement are its adaptability to the circumstances of the average photographer, its simplicity, and its inexpensiveness. It is not advisable to use it with objectives of less than four inches focal length.

Ordinary microscopic objectives, either achromatic or apochromatic, may be attached to a camera directly, after the manner of a photographic lens. With the Ilford chromatic plates there is no need to invest in the very expensive though otherwise excellent apochromats. A good achromatic objective, costing but a few shillings—and there are many such—with chromatic plates, will do average work as satisfactorily as apochromatic objectives on an ordinary plate. I do not mean to suggest that the apochromat, that is the objective in which the actinic and visual foci have been so corrected as to exactly coincide, is not the better piece of apparatus; but I do say that for the ordinary work in low-power photo-micrography the difference in results does not justify the heavy expense which the purchase of the apochromat entails.

It is very desirable when photographing a series of objects of the same genus, as, for example, a set of butterflies, that the operator should photograph each of them to some uniform convenient scale. To do otherwise detracts from the value of the work, and renders comparison of the photo-micrographs laborious and unreliable. By operating on an object of known size it is easy to ascertain, by experiment, what arrangement of the camera and object is necessary to obtain an image of any required size. This should be noted for future reference. The amplification having been determined on, a scale corresponding to it should be made. By applying this scale to the various parts of the photograph, the actual dimensions of the object may be readily ascertained.

I have recently seen a series of photo-micrographs of transverse sections of various kinds of wood. The photographs are admirable, and of the greatest value to the student. They were taken with a long extension camera and an ordinary rectigraph lens of 5 inches focal length. The wood specimens were propped up in front of the camera with their plane surfaces parallel to the focussing screen. Focussing was arranged with a Welsbach incandescent burner, and finally by means of a focussing glass and magnesium wire. The exposure was made with magnesium ribbon at a distance of eight inches from the object. Forty seconds exposure with ordinary Ilfords gave satisfactory results.

PHOTOGRAPHY IN MEDICINE AND SURGERY.

[A Paper read before the Edinburgh Photographic Society.]

Almost without exception, there is no modern art or science that can be spoken of as self-contained, as independent of the discoveries and advances made in the sister sciences, and least of all can this be said of the art and science of modern Medicine. Nowadays a medical man is more or less a jack-of-all-trades, and almost every other profession, trade, and sister science has in some way or other been laid under contribution, and made to pay its tribute to the ever-widening and extending realm of Medicine and Surgery. Your modern doctor must be capable of using his hands, his eyes, his ears, in many an odd fashion. He must be able to cut and stitch tissues and materials infinitely more tender and frail than the silks and satins of the milliner; to use the saw, the hammer, and the chisel on many a more delicate piece of work than the carpenter ever dreams of attempting; to work in plaster and in metal; and on occasion even to dabble in law and ethics.

My thesis, however, this evening is to try to demonstrate the important rôle played by the art and science in whose honour we are met to-night—photography, which has of late years most indefatigably lent its aid to the teaching and practice of the healing art. Has not every "interesting case" to be recorded, every experiment to be illustrated, every new microbe to be caught and imprinted on the sensitive plate of the photographer, and what more pleasing post-prandial recreation can the aspiring surgeon have than to dip into his album of "Before and Afters?"

My subject, I think, naturally divides itself into the following main heads or divisions, about each of which I ask your leave to say a few words in turn:—

1. The ordinary photography of a medical or surgical case.
2. Stereo-photography or Stereoscopy.
3. Micro-photography or Photo-micrography.
4. Radiography or Skiagraphy.
5. The practical and educational value of the medical photograph.

The last of these I shall take up piecemeal, discussing it as I deal with the other headings.

The photographing of a "case" is sometimes in nowise different from the taking of an ordinary subject in the studio, but often it has difficulties and even dangers superadded, and sometimes is well-nigh a matter of impossibility. Your "sitter" is only too frequently in bed—he may be too ill to be exposed to movement or risk of chill. Owing to the nature of his disease he may be unable to keep still for a few seconds together; the lighting may be bad and impossible to remedy—interesting cases have somehow an almost invariable knack of turning up in the winter months—and dozens of other difficulties may assail the medical votary of the camera.

One of the most useful contrivances one can use in many difficult cases is the inverting or canting-table, by means of which one can, with a sufficiently tall tripod, combat many of one's difficulties by looking straight down on the subject from above; and my canting-table, which I obtained from Lizars, has enabled me to take many an otherwise impossible photo with the patient in bed, or even lying flat on the floor. My favourite camera for almost every sort of work is the "Baroness" half-plate by the Royalty Company, with a Cooke anastigmat lens; while the stand I have found most convenient is one in which all the component parts slide with screw-adjusting clamps—a nameless trade-make stand of moderate price which I bought several years ago, the duplicate of which I have tried many times to obtain, but without success. Dark backgrounds are in my opinion most suitable for the majority of medical subjects, and usually a red blanket, a ward screen, or my black velvet focussing-cloth are the readiest to hand, while a white sheet or a mirror is often very useful to alter the lighting of the subject. Chromatic plates are a "sine quâ non" in almost every department of medical photography, where colour plays such an important part in the nomenclature and classification of disease, and it will indeed be a happy day for scientific medicine when a genuine and practicable method of photography in colour is discovered.

I always make my exposures with a Thornton-Pickard ball-release shutter, situated behind the lens. Thus one can keep one's eye on the patient while exposing, and can also time one's exposures more accurately. A useful dodge when focussing is to lay a piece of printed card or paper on the patient, as it is often very difficult, when photographing, say, the chest on a large scale, to be quite sure when it is all in accurate focus. If the subject be inanimate, I always use a very small stop and correspondingly long exposure. After the photo is taken, the subsequent proceedings are precisely similar to those in the case of an ordinary photograph.

I am afraid the majority of medical photographers have not the slightest desire to aim at producing photos with any claim to artistic merit, what is required being a mere record of the unvarnished, and often of the somewhat unpleasant, reality—everything if possibly sharp in focus; contrasts of the harshest; deformities and malformations brought out in all their native ugliness. Therefore I must beg of you not to expect anything of the nature of a highly artistic display, as I have only attempted to select representative photos of some general interest to bring before you—a somewhat difficult task, you may imagine, as they were, of course, taken with a very different object in view.

And now I should like for a moment to direct your attention to the great value of stereo-photography in the realm of scientific investigation, no less than to the admirer and student of Nature's works and scenery. Last month we were privileged to hear Mr. William Goodwin advocate the claims of this branch of photography, and demonstrate the realistic beauty of its effects.

Until recently I was under the impression that I had been the first in the Edinburgh School to apply and advocate the use of the stereoscope of Surgery and Medicine. But, alas! I should have remembered the old maxim, "There is nothing new under the sun." I showed some stereo photos of anatomical subjects upon which I had been engaged for Mr. Stiles to Professor Chiene. He looked at them, admired them, and said nothing further; but a few days afterwards he told us that on going home he had looked through his famous collection of Goodsir relics, and there discovered a dozen stereoscopic photos of medical subjects which must have been taken prior to 1867, the year of Professor Goodsir's death. These I am privileged to show you to-night through the kindness of Professor Chiene and Mr. Stiles. This being so, I cannot imagine how the idea did not at once lead to its general use in the profession. Had his results been published, and had more

been made of them, I am certain that at the present day every medical photograph would be looked at through the medium of the stereoscope. I have only to pass round a few such photos, and to ask you to be good enough to look at them, first with the unaided eye, and then by means of the stereoscope. No comparison is possible. I need say nothing further—the admitted confusion of the ordinary scientific photograph is at once resolved, and chaos gives place to cosmos. Every department of Medicine and Surgery would be the gainer. The student of anatomy or Surgery, Pathology or Medicine, cannot take his dissection or his case home with him for his evening reading. His work, as far as these are concerned, is a mere mechanical effort of memory, while a suitable series of stereograms is a not unworthy substitute, where the original has already been thoroughly studied in the laboratory or the class-room. Ere long, and it shall not be for lack of its advocacy on my part, it is my hope to see every lecturer making use of, and no practical class complete without the presence of this invaluable method of demonstration, infinitely superior in most cases to the diagrams and drawings at present in use, and certainly not of less value than the optical lantern, which is now such an indispensable accessory of teaching in almost all its branches.

As you have so recently heard a paper on the subject of stereophotography, it is quite unnecessary for me to go into details and principles; and I shall content myself with saying that, for photographing objects which are without life, any one who possesses an ordinary single-lens camera can quite easily obtain stereoscopic results by shifting each leg of his tripod two and a half inches to one side, and taking another photo, after carefully observing that the same object is exactly in the centre of the field. If the Wheatstone reflecting stereoscope be used, the size of the photo need not be restricted to the usual small pictures necessary for the ordinary Brewster instrument.

Micro-photography is the next subdivision of my subject, and it is one of the most important. To it Histology, or the science of the minute anatomy of the tissues, owes a deep debt, whether its field be pathological or physiological. The marvels of the microscope can now be recorded with the minutest accuracy, not by the erring pen of the draughtsman, but with the precision of the photographic plate.

Many ingenious forms of apparatus have been put on the market for this branch of photography, and I need not waste time in describing them. Any one possessed of an ordinary camera and microscope can quite easily rig up a makeshift which will answer the purpose fairly well if he does not aim at too ambitious results. The microscope stand must be hinged to allow of the instrument coming to the horizontal position, the ordinary lens is screwed out of the camera, and after removing the eyepiece of the microscope the two instruments are co-adapted by means of, say, a short piece of tubing lined with black velvet into which the microscope tube slides. Artificial light, whether it be in the shape of electric, an oil lamp, or magnesium riband, and a condenser with an iris diaphragm, are the other necessities required. The object to be photographed is placed on the stage of the microscope, and roughly focussed by the coarse and finally by the fine adjustment, the milled head of which it is of great convenience to have connected by a band with a focussing rod to which is fitted a milled head within easy reach of the operator's hand. If the objective is not achromatic, some difficulty may arise owing to the fact that the visual and chemical foci of the lens do not coincide, and to correct this one has to approximate the objective to the object by a slight turn of the fine adjustment, until the image on the screen is seen to be surrounded by a slight red halo. This difficulty is, of course, obviated by the use of an achromatic objective specially made for photographic use; but another difficulty may arise when an attempt is made in a counter-stained object to bring the parts stained by the different colours into focus at one time, but this may be combated by using as a condenser a hollow globe filled with some yellow-coloured solution, or a yellow glass screen by which the rays from the source of light are as it were filtered, and certain of them prevented from adding to the chromatic aberration. Isochromatic plates are indispensable in photo-micrography, and the exposure, as in every other branch of photography, varies greatly in length according to such circumstances as nature of object, power of magnification, source of illumination, rapidity of plate, and suchlike; but it may be interesting to note that the exposure given to some of the subjects which I shall presently show you on the screen was, with the oxyhydrogen light, from thirty seconds to a minute and a half on Edwards' isochromatic medium plates, with an oil immersion lens giving a magnification of one thousand diameters. A hint worth remembering in photo-micrography is that the minutest alteration or movement of any part of our apparatus, either after focussing or during exposure, will utterly ruin our results, and it is therefore necessary to have our source of light, which is almost always also a source of heat, either isolated from the rest of our instruments by an alum screen to cut off the heat rays, or left lighted long enough to allow the slight expansion brought about by its influence in the metal-work of the microscope full time to take place.

I should, if I do not weary you with these, I fear, somewhat dry details, now like to touch briefly on the subject of Radiography or Skiagraphy, as it has been variously named—in other words, the application of the X rays more particularly to Medicine and Surgery, and especially to the latter, which has in some of its branches benefited enormously by their discovery.

Foreign bodies of a metallic nature, splinters of glass or stone, can be localised in the tissues; calculi can be diagnosed; and the nature of the lesion in different fractures and dislocations, and in many diseases of bone, can be made out with much greater certainty than by employing many of the older methods; the heart can be seen beating in situ, and the action of the diaphragm studied; aneurismal dilatations of arteries can be diagnosed; and I may here mention in parenthesis that the X rays have also been used by some authorities with marked benefit in the treatment of obstinate cases of lupus and several other diseases.

As the technique of radiography is probably well known to all here to-night, it is perhaps needless for me to give any description of it. A powerful electric current is passed through a Crookes focus tube, which consists of a thin glass bulb, in the interior of which is a very high vacuum. In this are placed the concave cathode, and the platinum or osmium plate which constitutes the other or positive pole, set at such an angle that it reflects the rays into the convex portion of the Crookes tube, from which they pass to the object and sensitive plate.

The former axiom of the surgeon was, "Never attempt to remove a foreign body by operation unless you can feel it," but now we must also add, "unless you can see it." Every hospital now has its X-ray department, and I need not recall to your minds the immense aid which this new development of science has been to our surgeons in South Africa when dealing with bullet wounds and fractures among our gallant soldiers at the front.

W. E. Carnegie Dickson, B.Sc. (Edin.).

A LANTERN EXCENTRISCOPE.

It is a well-known fact that a curious optical illusion is produced by giving a diagram, like fig. 4, a circular motion from right to left. The observer will notice that each ring appears to turn, whilst the whole presents the appearance of a spiral spring. On the principle of this phenomenon the excentriscope is based, and the effects obtained upon the screen are far superior to those produced by the set designs of the chromotrope of the lantern kaleidoscope.

The excentriscope is furnished with transparent discs, which, by

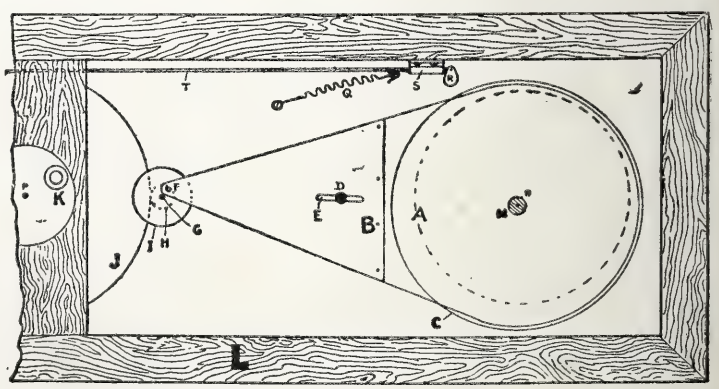


FIG. 1.

suitable mechanical means, are caused to revolve slowly on their own centres, whilst they are at the same time carried round excentrically. The projected image is that of an ever-changing design, in which some parts appear to be revolving from right to left, and others in the opposite direction. According to the peculiarity of the design—the combination of colours—and the rapidity of their motion, some portions of the design will appear to be altogether detached from their surroundings, revolving on an independent axis, whilst other portions appear to remain stationary. If the discs are touched lightly whilst

in motion, a change of the whole composition will be instantaneously produced, creating a phenomenon of great interest and beautiful beyond description. Reference being made to fig. 1, the instrument consists of a wooden framework, L, similar to that used for the ordinary chromotrope. There is a circular opening, A, shown by the dotted line, through which the coloured discs are exhibited. The disc-carrier, B, consists of a triangular-shape metal plate and a celluloid tongue, to the centre of which is fixed a round block, M, furnished with a pin, on which the discs are placed for exhibition.

The disc-carrier is supported and kept in position by a round-headed screw, D, working in the slot, E, the other end of which is attached at F to a small wheel. I. The wheel, I, furnished with cogs, indicated by the dotted line, H, is caused to revolve at a very high speed by being in communication with a larger wheel, J (the cogs of which are not shown in the diagram).

The large cog-wheel may be turned by means of the handle at K. Thus it will be seen that the cog-wheel, H, will make many revolutions

FIG. 2.

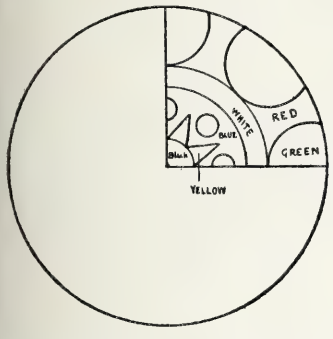


FIG. 3.



to each turn of the handle, and, as the distance between F and D is the same as the distance between D and the centre of M, the discs placed upon the pin will make a number of excentral motions equal to the excentral motions of F. Thus by centrifugal force the friction created between the edge of the hole in the disc, C, and the pin, the disc will be made to revolve in one direction, whilst the excentral motion will be in a contrary direction. The designs may be painted upon discs cut out of films, such as used in a camera. The paint is, of course, applied to the gelatine side, and not to the celluloid support.

The film is rendered transparent by fixing it in the hypo bath in the usual way without exposure to light, and, when properly dried, the designs are made upon the gelatine.

Two designs are suggested in figs. 2 and 3, such as will produce very curious effects upon the screen. It is obvious, however, that any number of discs may be used in the same instrument, and that there

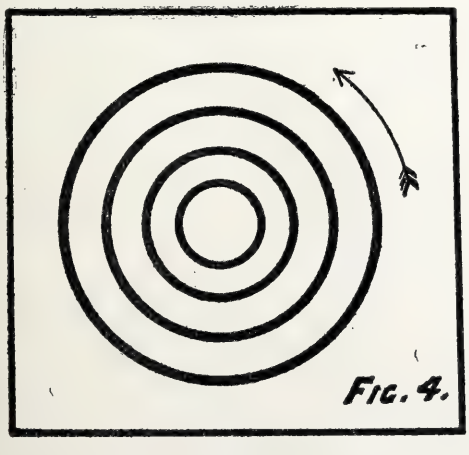


FIG. 4.

is practically no limit to the variety of designs that may be constructed.

It remains only to mention the means whereby the discs are checked whilst in motion, the effect of which has already been mentioned. On the inside of the framework a small guide plate, S, is fixed. This is furnished with a wire rod, T, communicating with a little weight, R, pivoted to the wire rod. A spring, Q, attached in the manner shown in the diagram, prevents the weight from coming into contact with the revolving discs till the desired moment.

On pressing a knob at the end of the rod, T (not shown in the diagram), the rod is pushed through the guide plate, S, when the weight, R, immediately comes into contact with the edge of the disc, and thus checks its rotary motion, with the result that the design is seen under a different aspect.

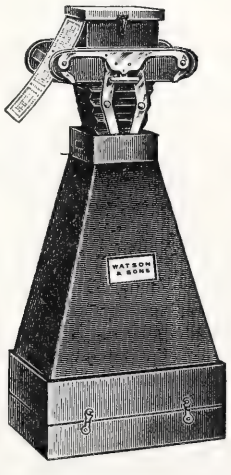
As the weight comes into contact with the revolving disc, the former being pivoted to the end of the rod, it flies upward, so that damage to the edge of the revolving disc, which would otherwise be done, is prevented.

It will be seen that, if the whole of fig. 2 was completed, there would be a star at the centre having eight points. Now the curious change that takes place when this design is exhibited in the excentriscope is that, instead of a star having eight points, one with only seven presents itself; and, further, if the disc is caused to rotate at a moderate speed, the star will apparently turn from left to right, whilst by increasing the speed, by turning the handle a little quicker, the star will remain stationary. It is fairly certain that the colour of any particular part has a lot to do with the apparent movement of those parts, so that it is the composition of colours, as well as the speed at which the designs are moved, that has to be taken into consideration when determining the causes of the phenomenon in the excentriscope.

THEODORE BROWN.

ENLARGERS FOR KODAK NEGATIVES.

MESSRS. W. Watson and Sons, of High Holborn, W.C., have submitted to us for inspection a simple little instrument for enabling Kodak film negatives to be enlarged on paper or glass. It is constructed for use in conjunction with the Kodak itself, so that the same lens which takes the negative also makes the enlargement. The system in practical use entails no focussing or adjustment; "the Kodak is simply attached to it; the negative and bromide paper put into position, and an exposure given, varying from 15 seconds in summer to 4 or 5 minutes in winter, according to the negative." A glance at the illustration will convey to the reader a clear idea of the manner in which the ordinary principles of enlarging are applied in this particular instance. The Kodak is removed from the outer case (the shutter being first opened and the diaphragm set to the desired aperture), and placed, lens downwards, in the narrow end of the enlarger. The projection must fit into apertures provided for them, and the camera set square. The film negative to be enlarged must then be placed between the two glasses of a carrier provided for the purpose, the film side being placed inwards. Quoting from the instructions, the photographer is now directed to



fasten the elastics to keep the negative in position, then to push the frame down into the body of the Kodak as far as the rebate in the frame, and next to close the shutter of the enlarger, and carry the whole apparatus into the dark room. "Unfasten the hooks, take off the end, and place between the glass and the piece of cardboard a sheet of bromide paper, sensitive side up, *i.e.*, towards the glass. Replace the end on the cone, by pushing the body of the cone down into it, not *vice versa*, or the glass or bromide paper may become displaced. Fasten the hooks securely, and carry the enlarger into the daylight. Draw the shutter, and make the exposure by pointing the negative towards the sky, being careful that neither the direct rays of the sun nor the shadow of any overhanging near obstacle fall across the negative." The instrument, as we satisfied ourselves from personal examination, is exceedingly simple to use in conjunction with a Kodak. It is supplied to fit the Brownie, the Pocket Kodak, and five of the folding varieties of this popular instrument, and, ranging in price from 6s. 6d. to 35s., supplies an efficient enlarging system which should be highly appreciated by the innumerable devotees of Kodak film photography.

PHOTOGRAPHY AND THE PRESS.

II.

Nikko, or a similar make of paper, is certainly the best when a print is made by means of the lantern. If, however, a contact print is required, it is needless to restrict oneself to the aforesaid. A very convenient substitute may be found in one of the various gaslight printing papers, such as Velox, Gravura, Dekko, &c. Either of the aforesaid makes, having a glazed surface, may be availed of.

These papers are easy to work, and, properly handled, yield very good and certain results. It is, however, necessary that some experience be enjoyed and observed. Here, again, a time-saving expedient, viz., to squeegee a wet piece of bromide paper in contact with the wet negative, and expose, strip, and develop right away.

With some negatives, which are lacking in definition or in vigour, hand work is called for upon the print, in which case it is advisable to use either of the above papers.

A CASE FOR ENLARGEMENT.

A better course to pursue is to make an enlargement upon a bromide paper having a matt or fine grain surface, so that the needful touching up can be easily and surely accomplished. In such a case, instead of enlarging the two diameters, it is better to increase the size to three or even more diameters.

The print is then worked up in monochrome, and when reduced down by the block-maker to half its size—or less—the hand work is, if skilfully done, in many cases hardly recognisable, although none the less exceedingly helpful.

In some instances it may be necessary to use a print-out paper, which, apart from the time it takes to print, tone, &c., has certain countervailing advantages which are not to be forgotten.

In summer, the time of printing is not very long, nor need the toning and fixing occupy much time. For such a purpose the combined bath may be used, as, although the resultant colour may not be of the best, and the print not prove so permanent as it might otherwise be, it will do very well for the block-maker.

After a rapid rinse, the print, if on gelatino-chloride, should be formalined—or alumed—and squeegeed on to suitable ferrotype, glass, or on to a pulp slab, the back of the print may then be blotted off, and the drying accelerated by the aid of gentle heat, say, 100 F. In a very short time the print will strip with a very high glaze.

If formalin is not at hand, and providing the paper is not unduly soft, it will generally strip even without having undergone any hardening. Besides being helpful to the block-maker, the glaze is very useful in enabling modifications of effect to be quickly and certainly obtained.

TONING DOWN BACKGROUNDS.

Thus, if the background of a figure subject is in part or whole somewhat over insistent, by stumping it with a little pumice powder, or other suitable substance, the glaze is reduced to a matt surface condition, with the result that both lights and shadows are toned down, the figure thereby gaining considerable relative prominence and strength. If preferred, the background may be subdued or flattened by means of a wash of semi-opaque water colour.

In some cases it is found very effective to rub down nearly the whole of the print and subsequently work upon it with body-colour, touching up some of the lights and toning down others.

The photographer should bear in mind that modifications made by hand in a print for publication need not be carried out with that nice attention to matching the tint of the photograph that is otherwise necessary, nor need there be any attempt made to conceal the work from sight. Thus, a brown print may be worked upon with, say, grey, half-tone applied to arresting passages of light, while the shadows, where extra strength is wanted, may be touched up with sepia or with any other convenient brown or red-brown. In painting in high lights it is well to use a body colour which is of high photographic power; of this class of pigment albumen is an example. This is made expressly for use in pictures intended for process reproduction.

In an article of this length it is, of course, impossible to do more than hint at how to touch up or mark up photographs. Those who need further information will find some helpful advice in the writer's book, "Popular Photographic Printing Processes," published by Upcott Gill.

As regards rapidity of handling, collodio-chloride paper is more convenient than is gelatino-chloride, inasmuch as it may be blotted off directly it comes from the washing water, and may be at once sent away by post. Collodio-chloride paper is also rather quicker printing and requires less time for toning, rinsing, and fixing than does gelatino-chloride paper. The gain in these respects is, to be sure, not very great, being a matter of perhaps not over five minutes, but even this saving is at times not to be despised.

In cases where unusually great haste is needful, a silver print may be sent to an editor simply as it comes from the printing frame, viz., untoned—and, of course, unwashed and unfixed. The writer has before now done this, and in consequence received payment for current-event photographs which would otherwise have just missed publication in the forthcoming number of the journal to which they were sent. A week later the illustrations in question would have been absolutely unpublishable.

Sometimes photographers, through peculiar circumstances, obtain negatives of good saleable subjects from which they cannot even get an untoned print in time for the post.

NEGATIVES FOR NEWSPAPERS.

In such a case do not hesitate to send on the negative to the journal you know—or believe—would be glad to print an illustration from it. Do not omit to add some explanation, something beyond the mere title is advisable, in order that the editor should fully appreciate the value or point of the subject; for it is not given to every one to translate the record of the negative into the graphic story which the positive will presumably tell.

UNDEVELOPED EXPOSURES WORTH MONEY.

The wide-awake photographer may sometimes turn a good penny even without a negative, for there are now several weekly and other illustrated publications having a staff of well-trained photographers who will undertake to develop all plates or films sent in which have been exposed upon subjects possessing news value. Most of the exposures forwarded to such establishments are by operators who are at a distance from places where developing possibilities exist. As, for example, at many parts of the scene of operations of the Transvaal War. But even in England—ay, in London itself— it is frequently only possible to be in time by handing one's exposures in at headquarters, and by trusting to the staff to find out whether the subjects caught are good enough for reproduction. In doing this one need not fear that there will be any remissness; for such is the competition to get striking news photographs that every endeavour will be exerted to make the best of the latent image. At the same time, inasmuch as their object in view is to do everything as quickly as possible, the washing is likely to be very inadequate, so that, should any negatives be returned to the sender of the exposed plates, he will be well advised to give them a thorough soaking and washing, that is to say if he thinks they are worth keeping. The writer has before now successfully availed himself in this way of the photographic staff of a London publication when taking snapshots of a London function. These, a few minutes after the exposures had been effected, were handed in at the office, and, within an hour of the taking of the subjects, blocks were being made from the negatives.

As a rule, the plates or films sent as above for development are snapshots, and, being mostly of moving subjects, taken at short range, and frequently in towns, or under more or less badly lit conditions, they are in consequence generally under-exposed. Hence there is a tendency, almost a second habit, to, as a matter of course, employ a developer in which there is much accelerator and no restrainer. Even so it is often found that the contrasts are too great. Should, therefore, a fully-exposed—let alone an over-exposed—plate be sent in, it is well to notify the fact, with the hope that it may not be ruined by putting it into a forcing developer.

USE POPULAR PLATES OR FILMS.

Here a few words of caution are not amiss respecting plates and films requiring special or peculiar methods of handling. In commercial establishments, such as newspaper studios, the staff, although in a good many cases they consist of well-trained photographers of considerable and varied experience, are not experimenters, but very busy people, who find the day's work often more than they can get through. Hence it is just as well not to send them any out-of-the-way make of film or dry plates. All ordinary films, flat or rollable, and all ordinary plates—including the most rapid—may, with confidence, be submitted to them for treatment, but there are plates and films constantly being put on the market, which, admirable as they are in their several ways, require certain peculiar manipulations without which more or less serious failures result.

It would be invidious to name any particular brands, but, by way of illustration, let me cite the case of some plates (not Sandell's), in which a very effective anti-halation device was employed, which, treated at one of the offices with other ordinary gelatine plates, were utterly ruined. With most of them the films floated off in the washing tank, and were there torn into pieces, the remainder being too badly stained to print from.

In another case a particular make of rollable film was hopelessly distorted by unequal stretching, simply for want of a little special treatment.

Hector Maclean.

"The Photographer."—The following notice appears in the January number of "The Photographer," published by Messrs. George Mason and Co., of Glasgow: "Since the advent of 'The Photographer' in 1880, the literature of photography has grown to such dimensions that the felt want the little 'Photographer' then was has been so far superseded, that we have resolved on altering the date of issue, and with the New Year a change in the publication of the little journal of jottings will take place. Instead of monthly, it will be issued quarterly—in January, April, July, and October. The jottings will be, as heretofore, culled from the best authorities and leading sources. The advertising pages, which has been one of the chief features of the journal, will have special attention, and will be kept up to date with everything new."

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No. 1.

THE ARTIST: "I dont think that will give me much trouble."

THE CAMERIST: "She's a good PAINTER, but let us see WHAT A CAMERA CAN do—AND some good Bromide PAPER."

WELLINGTON AND WARD.

ELSTREE · HERTS.

his native village; the amateur grocer may be seen in his little corner shop in any small suburb; the amateur clerk and bookkeeper merely starves. Use and custom and trades unionism have made it the rule that an apprenticeship or pupilage should precede the actual practice of the trades and professions. It is folly to assume that the possession of fair ability in negative-making is at the present time any indication that the amateur should take up photography as a business. We know, as a matter of fact, that a man may have assimilated all the combined wisdom of the handbooks, and still be without that necessary training and knowledge of routine and practice which alone puts him upon any terms of equality with the professional worker; the mere ability to annex medals is no criterion whatever; indeed, it often proves of very doubtful utility. Above all, is it unwise to follow the advice (often interested) of one's friends, who are greatly and frequently to blame? But, of course, there are occasions when a man shows marked ability, quite sufficient to justify such a course: if this ability is supplemented by business 'cuteness, and the necessary capital, then the venture starts under very favourable auspices. There is still room for photographic work of the best kind, best in the sense that it may combine the originality and art of the amateur with the finishing touches of the trained hand. It would be foolish to say that the professional is to be blindly followed and imitated, but it is undeniable that he has, for the main part, gauged the public requirements.

Now, supposing a man with the necessary capital and the artistic instinct strong upon him, what advice can we give to be of service, guiding ourselves by experience and observation? Well, the venture should be made in a town of some size and importance, preferably a town where, by reason of various trades and manufactures, business may reasonably be expected all the year round. Any well-meaning attempt to do everything oneself will be a certain prelude to mediocrity, if not failure: the services of a man of undoubted skill in retouching, and some experience in the studio, should be secured as of the first importance, not necessarily to take the lead, but as one whose advice it would be well to take on occasions; for many reasons, therefore, a young man should be chosen. The printing department is equally important, and should be managed by a first-class printer. One may have ideas as to posing and printing, style and effect, but they must be of real worth, artistic, and not sentimentally eccentric; people do not appreciate jokes, not even photographic jokes, at the expense of their features. Let a man (if only an amateur) show real skill and art in posing and lighting, and he will be ably assisted by the men, themselves professionally trained, whose services he has engaged. Some men essay too much; they may be clever, but one man cannot operate, print, and finish off, make enlargements, and do all the copying and odd jobs, with any satisfaction to himself or others. There is a tendency, too, in many places, towards waste in material, reckless exposure of plates, too much experimenting, perhaps, and use of stock to no clearly defined purpose: this is often the case with the young amateur beginner. A bankrupt tobacconist in the Liverpool Court some few years since had a bad quarter of an hour with the Official Receiver; he had confessed to being an habitual smoker, helping himself from stock. The Official Receiver told him, with other caustic and personal remarks, "That no business (of the size and class) would stand such a strain as this, and that every cigar smoked was so much profit consumed." It is worth any one's while to reflect on this matter, for it may not be his own goods he is wasting or using. The instincts and habits of the enthusiastic amateur lead him to scour the neighbourhood for pictures. This is all very well, but when he has a studio these excursions must be curtailed, or better ordered. There is money in lantern slides, but, if by reason of perfunctory habits and want of method one's average of saleable slides is only two out of twelve plates, where does the profit come in? All waste is so much the less profit. No sane photographer now neglects his residues; methods have been described in the JOURNAL for a systematic, almost automatic, recovery of such residues as are incidental to the use of plates and paper. The annual value of these residues in an existing business returning £2500 to £3000 yearly is over £40. Accurate and systematic account-keeping is most important; in any large business it pays to have accounts kept, or at the least audited, by skilled men who make a profession of this kind of work, and have a trained eye for errors in book-keeping; and, finally, he pays a photographer to see the best to be seen in our exhibitions, even if the pictures be a disappointment; there are mounts and frames and suchlike minor, but very necessary, adjuncts to a finished whole.

When a youth is apprenticed to learn the art and mystery, or craft, of any trade or profession there is significance in these words. In so many plain terms the amateur joiner, plumber, architect, builder, or whatever he may be, is heavily handicapped from the start—he is in a like predicament as a photographer in business if precautions are not taken. There is room in some of our large cities for the beginner, provided he is capable of the best work, or capable of providing the best work of others. The main idea must be the best work, and the successful man is he who can command it. J. PIKE.

GELATINO-CHLORIDE EMULSION.

IN the writer's article upon the above subject, which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY of July 6 and 13, 1900, he stated a preference for sodium chloride over ammonium chloride, as the emulsifier, giving as the reason that sodium chloride gives a lighter red image than ammonium chloride, and one which is much easier to tone, with less reduction in toning and fixing. Further experiments with ammonium salts confirm him in the opinion that they are not really suitable for chloride emulsions. A simple experiment seems (in the writer's opinion) to emphasise this, although in experimental photography it is never safe to make a statement of this kind in too positive a manner, as different formulæ and experiments seem to give varying results with different operators; but as the experiment is of an instructive nature, it is worth trying by any one wishing to study the subject thoroughly. Take either of the formulæ in the writer's article, but only take half (or even less will do) of the quantities given, as the result is practically of no use, except as an experiment, use two drachms less water to soak the gelatine in, substituting for this water two drachms of liquor ammoniæ .880, before emulsifying After the emulsification is finished, dip a glass rod into the emulsion, and look at some artificial light through the bead of emulsion which collects on the end of the rod, when, instead of the deep, rich orange colour which should be observed in a printing out chloride emulsion, a bluish-grey colour is noticed, which is utterly unsuitable for printing out. Besides this, it will also give a slightly different colour to the emulsion. This seems to prove very conclusively, to the writer's mind, that salts of ammonium, although very successful for bromide emulsions, are not nearly so suitable for chloride emulsions.

The colour which an emulsion gives by transmitted light should be carefully noted, as it is almost the only way by which the operator can tell with any degree of certainty whether the emulsification has been successful or not, although, after some little practice, the colour, smell, and general appearance of the emulsion give a certain amount of assistance. The colour by transmitted light is the main and most reliable way of telling, and as the eye becomes accustomed to this test the result may be determined with very great accuracy; and in making emulsions these little details must be studied and particularly attended to if success is to be attained, for the operator is working in the dark, in a double sense of the word, as practically no idea of the result can be obtained until the emulsion is finished, when, if it has not proceeded successfully, it is spoilt, and must be thrown among the residues, for nothing can be done with it afterwards.

It will generally be found that even the best gelatines contain slight traces of grease at times, and when this is the case the gelatine should be melted and raised to the right temperature for mixing, when the top should be lightly skimmed off before emulsifying, as the slightest trace of grease in the finished emulsion makes coating very awkward, for wherever the grease settles a bare space is left on plate or paper. Captain Abney's advice with gelatines containing a large quantity of grease is to dissolve them, let them set, and cut off the top. This is a very effective way of getting rid of the grease, but owing to the fact that it is necessary to keep the gelatine in a moist condition for a very long time, decomposition of the gelatine may set in, and its setting power be partially destroyed, both very undesirable conditions in this class of emulsion, and almost making the remedy as bad as the disease. Another disadvantage with this method is that it is very difficult to sell without a lot of careful weighing—how much gelatine the emulsion contains, and how much has been thrown away, especially in hot, dry weather, when the gelatine takes a long time to set and water evaporates rapidly, although, with care, an approximate result may be obtained.

It is not advisable to make more emulsion than is required to be used at one time, as gelatino-chloride emulsions do not keep well in bulk, decomposition rapidly setting in.

A certain amount of discretion should always be used in making emulsions, as conditions and chemicals vary very much, to say nothing of the errors of authors and printers, and it is not advisable to stick too closely to a given formula unless everything turns out satisfactorily.

Many of the advocates of albumenised paper contend that it is quite possible to get the same results upon that paper as can be obtained upon gelatino-chloride: but, considering that the organic silver salts in gelatino-chloride will print under green glass, while silver chloride will not print, the writer hardly sees how it is possible to do so, for albumen does not give nearly such a wide range in the various coloured rays of light as gelatino-chloride: therefore, the writer is unable to see how albumen can give the same results. C. T. SUTTON.

GILL'S COMBINED PLATE AND FILM CAMERA.

[Patent No. 14,466 of 1900.]

A IS the case, which is substantially rectangular in form and provided with semi-cylindrical end, *a*, within which are secured the film rolls. Of course, these ends may not be semi-cylindrical, but may be square or hexagonal, or any other suitable form.

B is a rectangular recess formed in the central portion of the case, said recess being formed by the back frame, *b*, having fitted in a suitable groove therein the slide, b^1, provided with a handle, b^2. The sides of the back frame are formed with an L-shaped groove, b^3, at each end. The sides of the recess are formed by the top and bottom side bars, B^1 and B^2, between which fit the slides, B^3, which close the chambers in which is contained the roll of film, the unexposed end of the roll being at one end and the exposed end being designed to be wound around on the opposite end by suitable means, which it is not necessary here to describe. It is sufficient to say that the film 2 passes between the back frame, *b*, and the back of the camera, B^4, as indicated in fig. 4.

C is the casing, or portion, containing the bellows or collapsible portion of the camera, such casing, C, being provided at the front

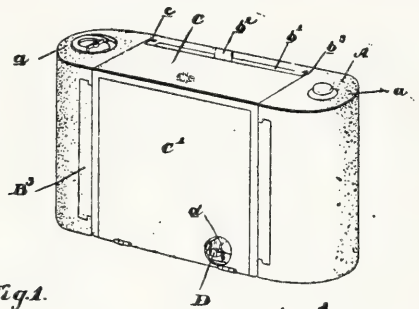


Fig.1.

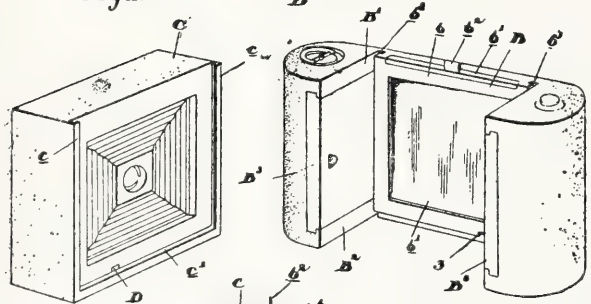


Fig.3.

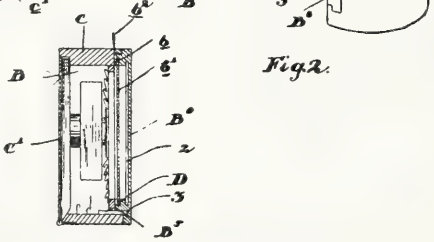


Fig.2.

Fig.4.

with a hinged flap, C^1. The casing, C, is provided at the back at the two sides with L-shaped tongues, *c*, such tongues being designed to receive a plate-holder when this portion of the camera is designed to be used separately with a plate-holder. Such tongues, however, are pushed up into the grooves, b^3, when it is designed to use this portion of the camera together with the portion, A, and utilise the film instead of a plate.

When the tongues, *c*, are pushed up into the corresponding grooves, b^3, the bottom ledge, c^1, fits up against the bottom, B^5, and the top of the case, as well as the bottom, would be flush with the top and bottom of the casing, A, being held in such position by the bolt D, which extends through the metal socket, *d*, on the casing, C, into a receiving socket, 3, in the casing, A, beneath the back frame, *b*.

A PROCESS FOR COVERING PLATES OR ROLLERS WITH A PHOTOGRAPHIC SUBSTANCE SENSIBLE TO THE ACTION OF LIGHT.

[Patent No. 22,370 of 1899.]

The roller is mounted upon a lathe, and a receptacle containing the said liquid is placed upon the support longitudinally, movable by the screw-threaded spindle of the lathe. When the roller is set in rotation, and a cock with which the receptacle is provided is opened, the liquid flowing down from the latter will cover the roller in spiral lines owing to the rotation of the roller, and the simultaneous advancing movement of the support, and thus of the receptacle. These spiral lines form then quite a uniform layer upon the roller.

This process also allows of a subsequent drying of the cover uniformly spread upon the roller. The same effect can also be obtained when the receptacle does not move in horizontal direction, but stands still, while the roller, besides rotating, advances simultaneously.

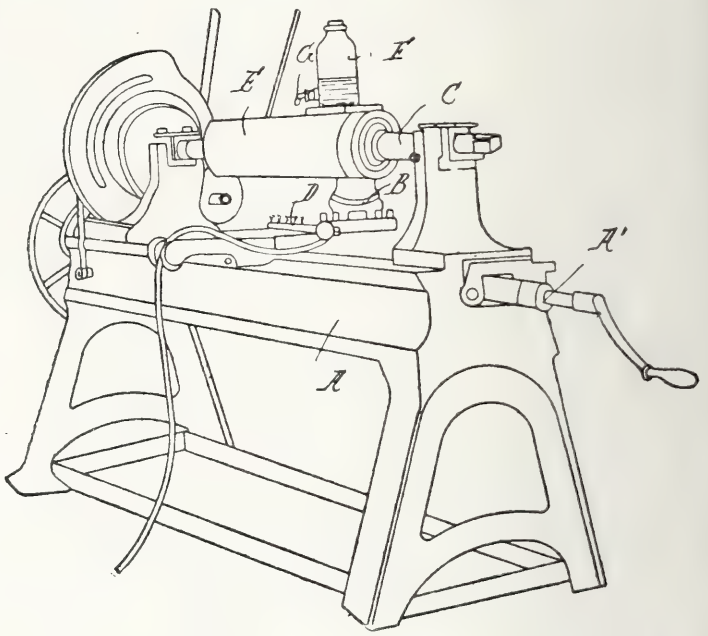
A spattule or the like attached to the support may be employed, which spreads the liquid distributed upon the roller to a uniform layer.

The process can also be employed for plates in such a manner that lines are drawn by the liquid flowing down from the small opening or narrow slit of the receptacle, so that the lines will mix with one another and form a uniform cover.

The process may also be carried out in such a manner that the liquid is distributed on to the plate from a small opening or narrow slit of a receptacle moved in such a manner over the plate, or the latter being moved underneath the small opening or narrow slit, that a uniform cover is obtained.

The apparatus for carrying out the improved process in respect of plates when adapting the liquid receptacle to move, may consist of a frame provided with a spindle and support, the latter being adapted to be moved longitudinally by the said spindle as in a lathe.

This support carries the said liquid receptacle, which is formed with



a small opening or narrow slit, whilst the plate to be covered is mounted upon the said frame below the said receptacle and adapted to be moved at right angle to the movement of the said support and receptacle.

The spindle by which the support is moved and the mechanism for imparting movement to the plate may be worked by two different handles or by one handle only, so that, after the support has moved certain distance and a liquid line is drawn upon the plate by the said receptacle, the plate may advance a short distance at right angles to the direction of the movement of the support, in order to obtain a second, third &c., line.

A is the lathe provided with a support, B, capable of being moved in the longitudinal direction by means of a spindle, A^1, provided with screw thread. Underneath the rotating shaft, C, of the lathe a heating device is arranged, as, per example, a gas pipe, D, provided with perforations on its upper part. The covering of the roller is carried out by means of this apparatus in the following manner:—

The roller, E, is mounted upon the shaft of the lathe in a suitable manner, and the support brought into its initial position, that is to say, to one extremity of the roller. Upon the support, B, a receptacle containing the covering liquid, as, for instance, a solution of chromic gelatine, is placed, and after the cock, G, of the receptacle, F, has been opened, the lathe is set at work in such a manner that, while the support advances, the roller rotates. As the roller only rotates, and is not moved in a longitudinal direction, and, on the other hand, the support upon which the receptacle is mounted advances parallel to the axis of the roller, the covering liquid flowing on to the roller forms fine spiral lines, which afterwards is spread absolutely uniformly upon the whole surface.

The heating device, D, prevents the cover in case, when chromic gelatine or the like is used, from solidifying before the spiral lines spread over the whole surface.

The heating device can also serve for a previously uniform heating of the roller surface to be covered, and for a subsequent drying of the cover.

IMPROVEMENTS IN THE MANUFACTURE OF CELLULOID IN FILM, PELLICLE, AND OTHER FORMS.

[Patent No. 25,434 of 1899.]

THE Farbwerke vormals, Meister Lucius and Bruning, of Hoechst a/Main, have found that certain derivatives of aromatic sulphonic acids of the general formula: $R:SO_2.A$, either by themselves or mixed with each other, may be employed as substitutes for camphor. In the formula "R" represents an aromatic radical or its substitution product (for instance, phenyl, tolyl, xylyl, naphthyl, nitrophenyl, nitrotolyl, alkyloxyphenyl, &c.), and "A" represents either an aliphatic or aromatic ether residue such as *o*- alkyl or residue of mono- or polyvalent alcohol, for instance, CH_3OH, C_2H_5OH, $C_2H_5CH_2OH$, $CH_2(OH)-CH(OH-CH_2(OH)$, &c,. and *o*- alphyl or residue of a mono or polyvalent phenol, such as phenol, naphthol, cresol, resorcinal, dioxydiphenylmethane, &c.; or a NH_2—group, which, non-substituted, may be substituted once or twice, for instance, NH_2, NHC_2H_5, $-N(C_3H_5)_2$, $-N\begin{cases}CH_3\\C_2H_5\end{cases}$, $-NHC_6H_5$, $-N(C_2H_5)C_6H_5$, $-NCH_2.COOC_2H_5$, $-N=CH_2$, $-NHC_6H_4-NH-$, $-NH.CH_2-C_6H_5$, $\left.\begin{matrix}RSO_2\\RSO_2\end{matrix}\right\}NCH_2$, C_6H_5, $\left.\begin{matrix}RSO_2\\C_6H_5CO\end{matrix}\right\}N-NCH_2.C_6H_5$, *etc.*

Thus, for instance, the derivatives obtained from the by-products in the manufacture of saccharine, the para-toluenesulphonnic-chloride, derivatives such as alkyl-para-toluenesulphonate, ethyl-para-toluenesulphonate, glyceryl-para-sulphonate, etc., alphyl-para-toluenesulphonate (phenyl-para-toluenesulphonate,cresyl-para-toluenesulphonate,etc.), para-toluenesulphonamides such as para-toluenesulphanilide, para-toluenesulphethylanilide and para-toluenesulphonic alkyl- and dialkyl-amides are capable alone or in mixture of serving as a substitute for camphor in the manufacture of celluloid and nitrocellulose- like articles, also for impregnation of cloth.

The process for producing films, pellicles, or the like, on materials such as raw photographic paper, consists in treating the nitrocellulose solution (the solvent being ether alcohol, amyl alcohol, amyl acetate, wood spirit, acetone, acetic ether, &c.) with small quantities of one or more of the sulphonic derivatives above mentioned, and then drying it; in order, however, to obtain a celluloid-like substance, the process consists in substituting in the usual celluloid manufacture such a sulphonic derivative wholly or partly for the camphor. In some cases it is advisable to mix two or more of the above-named substances, especially with such RSO_2-A bodies as by themselves dissolve too little nitrocellulose and possess too great a power of crystallisation, for instance, with non-substituted alphylsulphamides, which, when employed by themselves, cannot without difficulty be worked with nitrocellulose. By this mixture of a certain percentage the power of dissolving nitrocellulose is increased, and the tendency to crystallise is reduced.

EXHIBITION OF KODAK WAR PICTURES.

THE system of photography on rollable film presents so many advantages under circumstances where the use of glass plates would be accompanied by great difficulties owing, not only to their weight and the risk of breakage, but to the necessity for a dark room, or something that would answer the purpose, that it is not surprising that the Kodak is a popular form of camera with those whose business or pleasure it has been to practice photography at the seat of war in South Africa.

The exhibition of war pictures, taken with the Kodak, now being held at the branch of Kodak, Ltd., at 59, Brompton-road, S.W., is, however, of more than photographic interest. The collection on view consists of about 200 enlargements from Kodak film negatives; and, while it bears ample testimony to the capabilities of the instrument, no less impressive is it of the value of photography as a recorder of facts, which without such aid would pass unrecorded or, at the best, would be dismissed with a few lines from the pen or a few strokes of the pencil. The descriptive writer can only treat broadly the scenes and events with which he is dealing, and, however truthful may be his descriptions, his words can only conjure up a picture in the minds of his readers which is a compound of experience and imagination. The draughtsman naturally chooses for portrayal some leading feature or incident, and the necessities of composition too often induce him to make his picture what might have been rather than what was. In both cases, the necessity for the concentration of attention for a considerable length of time leads to breadth of effect at the expense of detail. Details a photograph can supply, and it does so in an inimitable manner. A snap of the shutter gives us as much as the eye can see of what is before the camera, and, however the print from the negative may be wanting in pictorial perfection, we may rely upon it in its fidelity to fact. Such pictures as "A wire entanglement on the Modder River," "The Boer laager at Paardeberg," taken after Cronjé's surrender, "Bridge of wagons at Klip Drift," "Getting transport over the Modder River the day after the battle of Modder River," "A machine gun in the trenches at Modder River," "British officers (prisoners) in barbed wire enclosure at Pretoria," "Bomb-proof shelter in Kimberley," "On the stoep at Modder River," "A kopje at Graspan," "Frere Bridge, destroyed by the Boers, and the temporary structure erected by the Royal Engineers," and "The Boer trench at Magersfontein, from which the Highland Brigade was shot down," supply local colour more effectively than could be done by any other means. After looking at such pictures as these one realises that no description could give so accurate an impression of the place. The disaster to the Highlanders at Magersfontein, as one of the most regrettable episodes in the war, was a central point of interest at the time of its occurrence. How and why did it happen? we all asked. The question is almost answered without words by the view of the enemy's trench we have referred to. A trench deep enough to allow men to stand upright unseen from the front, and before it what appears to be an illimitable plain of veldt. With the existence of the trench unsuspected, it requires no effort, with the help of the picture, to realise the natural fate of a body of men approaching within rifle shot across the coverless veldt.

Perhaps even in a way more valuable are the photographs of episodes in the war. Of course, such have always been favourite themes for the painter. We have accepted such pictures as "Napoleon Crossing the Alps," "The Meeting of Wellington and Blucher after Waterloo," "The Death of Nelson," &c., but we have never been deceived into believing that they were more than idealisations. "Majuba Day—Lord Roberts receiving the report of the number of prisoners who have surrendered." As we have it here we know it to be the representation of a reality. So will "General Hector Macdonald watching the battle of Driefontein," "General French watching effect of shell fire at Roodeplatz," "A 6 in. gun being dragged into position to cover the advance of the Guards' Brigade," "Funeral of Colonel Stopford at Modder River," "British Soldiers carrying Boer sick and wounded on Majuba Day," "2nd Devons crossing the Little Tugela," "Firing a 4.7 in. gun," and others.

We cannot even refer to many of the pictures, the subjects of which are of supreme interest. As we have said, there are 200 of them, and all well worth examining. The Exhibition is free, and will remain open until the 31st inst.

EXHIBITION OF THE BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.

THAT an institution like the Borough Polytechnic, the objects of which are educational as well as recreational, should have a photographic section is natural. That the work of such a section should combine in its character that of an ordinary photographic society and that of a technical class is also natural, considering the environment. Undoubtedly such a combination, although it is advantageous to the beginner rather than to the advanced student, is likely to do a greater amount of good to the community than the dilettante methods of the ordinary photographic society. The Borough Polytechnic Photographic Society actually comprises a photographic society run on the usual lines and an educational curriculum consisting of a connected series of practical lectures on technical photography. Hence, as one might expect, it attracts to its ranks a number of members who join for the sake of rudimentary instruction. In the Exhibition of a society like this one could hardly expect to find a collection of photographs of the same average merit pictorially as those to be seen at an exhibition of one of the leading metropolitan societies. Still, it is satisfactory to note that the recent Exhibition bore evidence that the leaders of the Society, while imparting sound technical instruction in photography, have not neglected its æsthetic application.

The Exhibition was held at the Borough Polytechnic, and was open on the evenings of the 27th, 28th, and 29th ult. This time the experiment was tried of opening it free to the public, and, judging by the attendance at the time of our visit, the experiment will have proved successful in that respect. If it attracted a class not likely to pay to enter such an exhibition so much the better, for it is something towards showing those who might not know it otherwise that the one cabinet and six cartes for 3s. 6d. style of photograph is not the only style photography is capable of.

The judges were Messrs. C. H. Oakden and H. Snowden Ward. Their awards are given below. The trade exhibitors were the Kodak Company, R. W. Thomas and Co., Ltd., the Rotary Photographic Company, the Prosser-Roberts Company, and T. Layman, Wellington and Ward, the Autotype Company, Otto Scholzig, Graystone Bird, and the Colour-Photo Company.

LIST OF AWARDS.

Pictures.—Bronze medal to A. J. Bullock, F. W. Bannister, E. W. Burch, H. C. Philcox, F. W. Gregg; certificates to R. R. Rawkins (2) and E. H. Sandon.

Lantern Slides.—Bronze medals to R. R. Rawkins and F. W. Gregg; certificates to F. W. Gregg, W. Page, and W. T. G. Mason.

EXHIBITION AT EDINBURGH.

We have before now referred to the benefit likely to accrue to professionals by exhibiting at those exhibitions that are not purely photographic from the fact that their work is brought before the notice of a large public, who would not see them at an exhibition that was solely devoted to photography. At the Exhibition under notice we have a solely photographic show, within another show, or, in other words, the Photographic Exhibition in connection with the annual Carnival in the Waverley Market, Edinburgh, forms a side show, to which a separate admission must be paid. The result, therefore, is that, before being allowed to pay for admission to the photographic exhibition, one must pay for admission to the main show. Judging from the numbers seen inside on the occasions of our visits, this mode of procedure—in spite of the loud-voiced invitations from the man at the door—has not caught on. There was a crowd outside, but inside the "twopenny" Photographic Exhibition—small as the space devoted to it was—there was room and to spare, even although the bewitching strains of pianoforte music were added to the other attractions, and a scantily-draped figure study was displayed outside. The Exhibition contains many good things and also many decidedly poor things, but the mode of conducting it does not conduce to the dignity of photography.

In the amateur classes pride of place was taken by Messrs. Alex. Allan and E. G. Brown, Edinburgh.

Six classes were allotted to professionals, and some good work was shown, Mr. R. Ayton, Bruntsfield-place, Edinburgh, securing the prize awarded to the exhibitor taking most points in this section.

Portraiture: 1, R. Ayton, with a delightful study of a girl; this photograph, if we mistake not, was medalled at the Edinburgh Photographic Society's Exhibition under the title of "Mistletoe;" 2, T. Burns, Edinburgh, "A Lady;" this portrait is principally noticeable for the skilful treatment of the white dress worn by the lady; 3, A. R. Edwards, Selkirk, "A dog;" this is a good photograph of a dog's head. J. L. Shawcross, Blackburn, had some good work in this class, although it did not catch the judges' eye.

Figure and Genre: 1, R .Ayton, "The 'Cellist," a beautifully soft portrait of a musician—a good model artistically portrayed; 2, W. J. Anchorn, Arbroath, "The Good Yarn;" here we have an old exhibitor again returning to exhibition; his picture reminds one of the old genre school, of which he was for long a prominent exponent; the print is rather hard, but it "tells its story;" 3, W. D. Brown, Lanark, "The Tinsmith's Shop," an interior with sharp, clear detail; the scattered lights are rather distracting, however.

Enlargements, any subject, 30×24: 1, R. Ayton, "Child Study." This was on show outside, and seemed, as seen in the conflicting lights, to be quite up to Mr. Ayton's standard. 2, Wm. Mitchell, Selkirk, "On the Way to the Fields," a pleasing picture. 3, D. H. Munro, Heriot-place, Edinburgh, "Contemplation and Realisation," a good study of children.

Carbon Enlargements, any other subject, 30×24.—1, M. and T. Scott, Edinburgh, a grand portrait (bust) of an old man with a plane, a strong model, strongly treated. 2, H. Ayton, Bruntsfield-place, Edinburgh, "Child Study;" a pretty portrait of a girl lying in a chair. 3, A. R. Edwards, Selkirk, "Daisy." W. D. Brown, Lanark, was very highly commended for a rather out-of-the-way subject, "The Foxes' Den."

Carbon Work, any subject.—1, R. Ayton, "Child Study." Again Mr. Ayton scores with the children. 2, R. Ayton, "Dog with Dog." This title needs some explanation, as the picture represents a little youngster at rest guarded by a big dog. 3, T. H. M. Colledge, Innerleithen, "Evening—A Quiet Road"—good work.

Class 21 (This class has been added for some reason or another). Here first and third prizes are won by W. Norrie, Fraserburgh, and second by J. H. M. Collidge, Innerleithen.

Messrs. James Patrick and James Burns were the judges..

Our Editorial Table.

The Axe Brand Flashlight Powder.

Agents: Messrs. Fuerst Bros., 17, Philpot-lane, E.C.

In sending us a sample of this powder Messrs. Fuerst Bros. draw special attention to the fact that it contains no explosive material such as chlorate or permanganate of potash, or picric acid. The powder is



sent out in cartridge form, and by the aid of a small piece of touch paper may be very easily ignited, thus obviating the employment of a lamp. We can testify that this powder answers extremely well in practice. Messrs. Fuerst also send us a sample clearing-cartridge manufactured by the firm of J. Hauff and Co. This is a bright crystal freely soluble in water.

THE LATE SAMUEL HIGHLEY.

The old century did not expire without carrying off with it one who was identified with photography and its journalism in their comparatively early days. Mr. Samuel Highley, F.C.S., who died recently, had long since passed out of the sight and mind of the photographic world, but nearly forty years ago he was an assistant-editor of this Journal, and on the title-page of the Almanac for 1861, a tiny little volume which one could carry in the waistcoat pocket without courting the smallest discomfort, his name appears as the Editor. He interested himself in popularising optical projection for scientific purposes, and some of his articles on the subject, written at about the date mentioned, are so admirably expressed that, if reprinted now, they would pass muster as the work of a modern author newly emphasising the value and advantages of the lantern in the lecture room. A full list of Mr. Highley's public contributions to general scientific knowledge lies before us in the form of a printed pamphlet. Besides photography, mineralogy and microscopy appear to have been amongst his subjects. He was a prolific writer and a man of varied tastes and occupations. The late Mr. Highley's old friend and confrère, George Dawson, also ended his days in the Charterhouse, into which haven of rest, so sympathetically described by Thackeray in "The Newcomes," both were assisted by those associated in more recent times with the conduct of the Journal. Right to the last it was pleasing to note that both gentlemen retained a kindly thought for The British Journal of Photography, which had helped them up to their successes, and did not turn away from them in time of need. Mr. Highley who was in his 75th year, was Secretary of the Photographic Society of Great Britain in the year 1857, and in his time held many other scientific and journalistic offices. He passed a varied, busy, and useful life, and his record, if unfamiliar to the present generation of scientific journalists, was as creditable as it was full.

RECENTLY ELECTED OFFICERS OF SOCIETIES.

(Received too late for the Almanac.)

American Institute (Photographical Section).—Established 1859. Meetings held at 19–21, West Forty-fourth-street. *President:* Mr. Oscar G. Mason.—*Vice-President:* Mr. R. A. B. Dayton.—*Treasurer:* Mr. James Y. Watkins.—*Secretary:* Dr. John W. Bartlett, 149, West Ninty-fourth-street, New York City, N.Y., U.S.A.

Auckland Camera Club.—Established 1885. Meetings are held at Grey-street. *Patron:* Dr. J. Logan Campbell.—*President:* Mr. R. B. Walrond. *Vice-Presidents:* Messrs. J. R. Harma, Joshua Martin, E. W. Payton, and D. Goldie.—*Committee:* Messrs. A. G. Whittington, T. D. Leedham, S. Frith, and M. Trenwith.—*Secretary and Treasurer:* Mr. H. R. Arthur, c/o Auckland Gas Company.

Bendigo Amateur Photographic Association.—Established 1895. Meetings held at the School of Mines, McCrae-street, Bendigo. *President:* Mr. J. B. Edwards.—*Vice-President:* Mr. H. E. Hill.—*Committee:* Messrs. J. B. Edwards, H. E. Hill, F. D. Jones, W. Vale, T. Hall, J. Miller, R. Jeffrey, and J. Burston. *Hon. Secretary and Treasurer*—Mr. J. Burston, Reginald-street, Quarry Hill, or 3, Pall Mall, Bendigo, Victoria.

Doncaster Camera Club.—*President:* Mr. Edward Gledhill.—*Vice-Presidents:* Messrs. Woodley and Buckley.—*Committee:* Messrs. Moat, Drewry, and Yates.—*Auditor:* Mr. H. Waterton.—*Chess Section:* Mr. W. H. White (Hon. Secretary).—*Hon. Secretary:* Mr. E. E. Burgess, Oriental Chambers, Station-road, Doncaster.—*Assistant Hon. Secretary and Treasurer:* Mr. T. H. Connor, jun., Market Place, Doncaster.

Dunedin Photographic Society.—Established 1890. Meetings held at Liverpool-street, Dunedin, on the third Wednesday in each month. *President:* Mr. R. A. Ewing.—*Vice-Presidents:* Messrs. A. J. Barth and R. Chisholm.—*Committee:* Mr. J. C. Thomson, Dr. Roberts, Messrs. W. Melville, C. O. McKellar, and T. P. Webber.—*Secretary and Treasurer:* Mr. J. Skottowe Webb, c/o National Insurance Company of New Zealand, Dunedin.

Haarlemsche Amateur Fotografen Club.—Established 1891. Place of Meeting, Haarlem Societeit Vereeniging. *President:* N. van der Sleen.—*Treasurer:* Maurits H. Binger.—*Secretary:* Frans Huijsser.

Hawke's Bay Camera Club.—Established April 19, 1895. Meetings held at the Club Rooms, Regent-street, Napier, N.Z. *President:* Dr. J. H. E. Jarvis.—*Vice-President:* Mr. F. W. Williams.—*Committee:* Messrs. T. B. Bear, S. E. Cooper, R. J. Duncan, A. A. Kennedy, F. J. Shanly, and A. J. Williams.—*Secretary and Treasurer:* Mr. W. Beswick, Post Office, Napier.

Isle of Wight Photographic Society.—Established 1898. Affiliated to the Royal Photographic Society. *President:* Professor J. Milne, F.R.S., F.G.S.—*Vice-Presidents:* Lord Alverstone, Messrs. T. B. H. Cochrane, J.P., D.L. (Deputy-Governor, I.W.), Godfrey Baring, J.P., D.L., C.C., Captain J. B. Seely, C.C., M.P., Colonel Robert V. Malden, F.R.P.S., and Mr. Edward Wilson.—*Committee:* Messrs. W. L. Bright, F. Cooper, W. Jolliffe, L. Jordan, W. T. Mahy, W. W. Odell, H. F. Scott, E. T. Sheaf, and S. Wright.—*Auditor:* Mr. J. W. Way.—*Secretary and Treasurer:* Mr. Ernest A. Swane, 30, Nodehill, Newport, I.W.

Minneapolis Camera Club.—Established 1892. Meetings are held at 309, Nicollet-avenue, Minneapolis, Minn., U.S.A. *President:* Mr. H. E. Murdock.—*Vice-President:* Mr. F. V. Haven.—*Board of Directors:* President, Vice-President, Treasurer, Secretary, Messrs. George W. Beach, E. J.

imball, L. J. Skinner, A. S. Williams, H. E. Peck, and Oscar Tucker.—*reasurer:* Mr. J. F. Schlimme.—*Secretary:* Mr. C. J. Hibbard, 323, Henepin-avenue.

NELSON CAMERA CLUB.—Established 1888. Meetings held at the Club ooms, Nelson, N.Z. *President:* Mr. C. Y. Fell.—*Committee:* Messrs. H. rusewitz, H. V. Gully, and A. Sclanders.—*Treasurer:* Mr. F. W. Hamilton. -*Secretary:* Mr. A. H. Patterson, Nelson, N.Z.

NEW SOUTH WALES RAILWAY AND TRAMWAY CAMERA CLUB.—Established ctober 10, 1894. Meetings held at the Railway Institute, Sydney, N.S.W. *resident:* Mr. H. McLachlan.—*Vice-President:* Mr. H. Carruthers.—*ommittee:* Messrs. T. Marsh, D. C. Williamson, A. J. Leslie, and C. S. obins.—*Treasurer:* Mr. J. Paterson.—*Secretary:* Mr. J. Scoular, Railway nstitute, Sydney, N.S.W.

PHOTOGRAPHIC ASSOCIATION OF JAPAN.—Established 1893. Place of Meetng, Tokio. *President:* H.E. Prince M. Nijō.—*Vice-President:* H.E. Viscount M. Nagaoka.—*Committee:* H.E. Count U. Toda, H.E. Viscount nomoto, H.E. Baron Hanabusa, Captain S. Toya, Dr. T. Katō, M. Nakajima, . Konishi, H. Shigyo, H.E. Count S. Omura, H.E. Viscount Okabe, Rigauhakushi D. Kikuchi, K. Ogawa, I. Tanaka, Dr. Marumo, S. Kiga, and S. ajima.—*Art Commissioners:* M. Nakajima, K. Ogura, K. Takahashi, R. aruki, T. Saitō, R. Mitsumura, M. Ohashi, I. Tanaka, T. Narita, A. Futami, . Kiga, and R. Yūki.—*Treasurers:* S. Ohashi and K. Ikeda.—*Secretaries:* enji Ogura and Professor I. Ishikawa, 77, Minami-enokimachi, Ushigome, okyo.

PHOTOGRAPHIC SOCIETY OF INDIA.—Club and Dark Rooms, 57, Park-street, alcutta. *President:* T. Archdale Pope.—*Vice-Presidents:* A. Caspersz and . Giannacopulo.—*Committee:* C. H. Coates, W. R. Donogh, T. C. Downing, . Moreau, Maharaj Kumar P. K. Tagore, F.R.P.S., A. Tocher, G. Watt, .I.E., T. H. Wilson, and G. P. Symes Scutt.—*Hon. Treasurer:* A. Mair.—*on. Secretary:* A. R. Catto, 57, Park-street, Calcutta.

PHOTOGRAPHIC SOCIETY OF NEW SOUTH WALES.—Established 1894. Meetngs held at the School of Arts, Pitt-street, Sydney. *President:* His Honour udge Docker.—*Vice-Presidents:* Sir J. P. Abbott, K.C.M.G., Messrs. R. W. irk, and E. T. Davis.—*Committee:* Messrs. H. T. Blake, James Heron, M. V. urphy, A. J. Perier, and L. Roever.—*Treasurer:* Mr. John M. Jago.—*ecretary:* Mr. James S. Stening, Box 829, G.P.O., Sydney.

QUEENSLAND AMATEUR PHOTOGRAPHIC SOCIETY.—Established 1883. Meetngs held at the Technical College, Brisbane. *President:* Dr. Wilton Love.—*ice-Presidents:* Dr. Wheeler, Messrs. C. J. Pound, and H. W. Mobsby.—*ommittee:* Messrs. E. A. Blackboro', A. W. Pigott, Alexander Clark, and . G. Jackson.—*Treasurer:* Mr. J. L. Kinloch.—*Secretary:* Mr. W. C. oller, 88A, Queen-street, Brisbane.

SPRINGFIELD CAMERA CLUB.—Established 1892. Meetings are held at the .M.C.A. Building, Springfield, Mass., U.S.A. *President:* Mr. Joseph D. oscoe.—*Executive Committee:* Messrs. Joseph D. Roscoe, John W. Roberts, . C. Langdon, E. L. Pease, and F. H. Huntley.—*Room Committee:* Messrs. . D. Copeland and Philip W. Lee.—*Secretary:* Mr. John W. Roberts, .O. Box, 1016, Springfield, Mass., U.S.A.

SUNDERLAND PHOTOGRAPHIC ASSOCIATION.—Established 1888. Meetings eld at the Café, Fawcett-street. *President:* Mr. William Milburn.—*Vice-residents:* Messrs. William Bartram and Thomas Walton.—*Council:* lessrs. William Horan, G. Bartram, J. W. Broderick, R. G. Posgate, W. C. rown, T. F. Forde, and A. Peddie.—*Secretary and Treasurer:* Mr. W. I. ope, 41, New Arcade, Sunderland.—*Reporting Secretary:* Mr. W. Keiffer.

WORKING MEN'S COLLEGE PHOTOGRAPHIC CLUB.—Established 1892. Meetngs held at the Working Men's College, Melbourne, Victoria. *President:* rofessor Kernot, M.A., M.E.—*Vice-Presidents:* Messrs. F. A. Campbell, .E., T. C. Camm, and A. J. Campbell.—*Committee:* Messrs. H. P. Bennett, . J. Eastham, J. Alexander, H. Vanheems, and W. Saunders.—*Librarian:* Ir. J. Glover.—*Lanternists:* Messrs. A. B. Sturtevant, J. Glover, and J. athie.—*Hon. Instructor:* Mr. L. Hart F.R.M.S.—*Press Correspondent:* Ir. P. H. McElroy.—*Hon. Treasurer:* Mr. E. C. Moore.—*Hon. Secretary:* Ir. Arthur J. Relph, Government Printing Office, Melbourne.—*Assistant ecretary:* Mr. C. R. Du Rieu.

News and Notes.

A NEW STUDIO.—Mr. G. Watmough Webster and his son, Mr. S. Mather Vebster, of Chester, have recently opened a new studio in Grange-road, Vest Kirby, and they send us a copy of the neatly-produced little pamphlet n a green cover, which they are issuing to their clientèle. This gives a list f Messrs. Webster's Royal, noble, and distinguished sitters, of many of hose portraits they print some exquisite half-tone reproductions. Groups, uvenile photography, interior and exterior work, and "a special epartment for business photography" are also undertaken by Messrs. Vebster, to whom we wish success in their new enterprise.

EXHIBITION of Modern Illustration.—It has been found necessary to ostpone the opening of the Exhibition of Modern Illustration in the idian Section (Imperial Institute-road) of the Victoria and Albert luseum, from Monday, January 7, until Monday, January 14. The priate view will consequently take place on Saturday, January 12, instead January 5, as previously announced. The Exhibition will be open free very day: on Mondays, Tuesdays, and Saturdays, from 10 a.m. till) p.m.; on Wednesdays, Thursdays, and Fridays, from 10 a.m. till p.m.; and on Sundays, from 2 p.m. till dusk. The Exhibition will reain open about three months.

PHOTOGRAPHS of Electric Spark.—In last week's issue of "Nature" there appears, over the signature of Hugh Walsham, a letter illustrated by a singular photograph of the spark from a static electric discharge. A large Holz machine with eight 29 in. plates had been employed, after being adjusted to give 7 in. sparks, a dry plate, wrapped first in orange and then in black paper, was placed between the knobs of the conductors in a line parallel with them and the spark allowed to play over the envelope for a second of time. The positive pole is represented by a thick brush of light radiating away from the negative, at the negative pole there is a shorter, more fan-shaped brush radiating away from the positive, and a short luminous line or band appears to almost join the two "brushes." The writer says: "The results of the experiment are curious. I am unable to explain them." Possibly some of our readers may be able to offer a suitable explanation.

EXPOSURE Meters.—An esteemed correspondent writes: "I have read with much interest the article by you on 'Exposure Meters,' &c. You rightly say that exposure tables are a rough means of getting the exposure; in fact, for any scientific view they are all out of date. Practically they all depend on the assumption that the light depends on the sun's altitude, and nothing else. Then all else is left to judgment, and this requires much experience, and is very misleading when one moves from one climate to another. One of the tables professes to serve for India. Now, I know something of India, and I know that the climate and the light vary enormously without material change of latitude. I know that the mornings are infinitely more favourable for photography than the afternoons at the same time of the year, and, as far as my experience goes, that is equally true everywhere, and to ignore it is to blunder. In the same way there are changes which make the light in the two halves of the year (before and after the solstices) entirely different. All this is not so noticeable in England, but any careful observer must know it. Hurter and Driffield's actinograph includes this erroneous hypothesis in the curves. The only remedy is a meter to ascertain the value of the light on the day and at the time. By the bye, Mr. Fernau has in his rules only modified (for the worse) the data given in the letters in the JOURNAL for 1899, pp. 575 and 607."

AUSTRALIAN Photographers and the New Commonwealth.—Our contemporary, the "Australian Photographic Journal," has been engaged in organising a deputation of professional and amateur photographers to wait upon the Premier (Sir Wm. Lyne) for the purpose of obtaining a Government grant of £200 or £250, suggested to be given in prizes to photographers of New South Wales, whether professional or amateur, for the best series of photographs, illustrating interesting incidents in connection with the inaugural Commonwealth celebrations. Provided this request is favoured by the Government, the "Australian Photographic Journal" says we may expect that a committee will be formed to draw up a syllabus of conditions and amounts of prizes. The following is an extract from a few notes subscribed for the purpose of laying before the Premier of New South Wales in support of the appeal as above: "This deputation has in view the inestimable value of an exhaustive pictorial record of the official proceedings in connection with the Commonwealth celebrations and other interesting incidents in the interests of historical record and for public uses throughout the British Empire. It is suggested that the Government shall have claim to two copies of the winning series, made by a good permanent process, for the purpose of filing and preserving for historical record, and placing in such public institution as the Government may appoint for use by the general public."

Commercial & Legal Intelligence.

"WILSON'S Photographic Magazine" states that the new buildings of the Mechanics' Institute, Rochester, N.Y., endowed by Mr. George Eastman a few months ago, are progressing finely. It is expected that they will be ready for service early this month.

THE Tella Camera Company.—Mr. A. L. Adams, of Messrs. Adams and Co., 26, Charing Cross-road, W.C., writes: "May I ask you to kindly notify that I have resigned my seat as Director, and now have no connection with the Tella Camera Company, Ltd."

MR. J. M. Turnbull, of 6, Rose-street, Edinburgh, announces his retirement from business, after having been established for the long period of 37 years. His successor is Mr. J. F. Duthie, who has been a partner for the last three years. We wish Mr. Turnbull long life and good health in his retirement, and Mr. Duthie every prosperity.

WE are informed that, owing to the increase in the business of the Company, and the desirability of further increasing the capital, the Gem Dry Plate Company, Ltd., have decided to reconstruct, and to continue under the same name as a new company, with £10,000 capital. The shareholders and Directors remain the same. Mr. T. E. H. Bullen is, however, appointed Managing Director to the new and also Liquidator to the old Company.

CERAMIC Photography.—Mr. H. Pennington, of 9, Vine-street, Stoke-on-Trent, writes: "In reply to your correspondent, W. Walker, regarding ceramic photography, I beg to say that I undertake all sorts of such work, whether tiles, plaques, vases, or any other kind of pottery." Mr. G. A. D. Brimmell, of The Castle Studio, Launceston, also writes: "Seeing a query in your Correspondence columns from W. Walker with regard to photo for monument. I had one done for me some time ago by Messrs. T. Illingworth, Willesden, on an ordinary 6 in. square tile, as

used for hearths, &c., and it answered the purpose well. I may say that, to further protect it, it was let into the stone, and a thick bevel glass placed over and made air-tight."

THE Austin-Edwards Monthly Film Negative Competition.—Of this competition, in which the awards have been made each month since its institution in October, 1896, we append the particulars and conditions, which will, no doubt, prove serviceable to intending competitors and others: A Frena camera is awarded each month in competition for the best film negative on an Austin-Edwards Film (setoloid or celluloid). Any size negative or subject may be chosen. All unsuccessful negatives are returned, and the winner receives a new Frena camera (memo size), loaded with 40 setoloid films. The following are the conditions: 1. The negative must be on an Austin-Edwards Film, and the sender must fill up a form (supplied free on application) stating this, and where procured, and must send in negative and one print from same, together with a stamped and addressed envelope for return of negative if unsuccessful. 2. The winning negative and all prints become the property of Messrs. Austin-Edwards. 3. The prize camera will be forwarded to winner on the 15th of each month, and the negatives entered for competition must have been developed during the preceding month, or, in the case of competitors abroad, within the preceding two months, and must be sent in before the third of the month in which the award is made.

THE Metric System in the American Congress.—Now that the House Committee in charge of the Bill to substitute the Metric system in place of our present system of weights and measures has decided to make a favourable report (says the "Scientific American"), the chances of our having to think and talk in terms of metres and kilogrammes become very real. The arguments in favour of the metric system are so many, so reasonable, and so well known that it is not necessary to reiterate them now. Apart from the saving of time and labour among ourselves, there is the commercial advantage which will be gained by abolishing a system of weights and measures which seriously hampers us in our trade with almost all the foreign nations, and particularly with the Latin-American republics. The English-speaking races stand alone in the use of the old and largely-discredited system; and, although these races are far in the lead in manufacture and commerce, and have the power, if they wish to perpetuate for many a decade to come a confessedly clumsy and antiquated system, every argument of utility and convenience calls for the substitution of a decimal system, which, by long use, has proved its all-round superiority. It is scarcely likely, however, that such a change will be made during the present Congress, and the probability of the Bill's becoming a law would be greatly increased if the other great branch of the English-speaking race could be induced to make the change simultaneously with this country. The agitation in favour of the metric system is as strong, possibly stronger, in Great Britain than it is here, and, in view of the close trade relations and the enormous volume of business between the two countries, it is well worth considering whether an attempt at concerted, or rather simultaneous, adoption of the metric system would not be advisable.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
7.....	Bognor	Paper by E. L. Wood.
7.....	Doncaster	*Exposure and Development.* Rev. E. C. Lambert, M.A.
7.....	Glasgow and West of Scotland .	Demonstration: *Finishing Prints.* Arch. Watson and J. C. Oliver.
7, 8	Newcastle-on-Tyne	Annual Exhibition and *Conversazione.*
8.....	Manchester Amateur	Prize Lantern Slides and Open Lantern Meeting.
8.....	Rotherham	*Narrow and Wide-angle Lenses.* W. E. Debenham.
8.....	Royal Photographic Society ...	*Some New Methods of Intensification and Reduction.* C. H. Bothamley, F.I.C., F.C.S.
8	Thornton Heath	Second Annual General Meeting.
9.....	Borough Polytechnic	*The Lens—What it can and cannot do.* Albert T. Harris, F.S M.C.
9.....	Edinburgh Photo. Society	*Bird-nest Photography.* Harold Raeburn.
9.....	Sefton Park	Annual Business Meeting
10.....	Hull.....	Yorkshire Photographic Union Slides.
10.....	Leigh	*Across Italy.* James Shaw.
10.....	Liverpool Amateur	*Evesham and District.* Charles F. Depree.
10.....	Manchester Amateur	*Retouching Negatives.* R. J. Harrison.
10.....	Woolwich Photo. Society	*Control in Printing.* G. J. T. Walford.
11.....	Aberdeen	Social Evening.
11.....	Croydon Microscopical	*Improvement and Modification of Negatives and Prints.*

FORTHCOMING EXHIBITIONS.

1901.

January 14–19..... Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

February 16–March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.

Patent News.

THE following applications for Patents were made between December 17 an December 22, 1900:—

PLATE-HOLDER.—No. 23,033. "New or Improved Means or Appliance fo Holding Photographic Negative Plates during their Development an subsequent treatment." W. MCINTOSH.

APPARATUS.—No. 23,120. "Improvements in or connected with Apparatu for Use in Producing Photographs." H. FARMER.

CINEMATOGRAPHY.—No. 23,121. "Improvements in Apparatus for Obtainin and Projecting Animated Pictures." P. W. DAVIES.

CINEMATOGRAPHY.—No. 23,339. "Improvements in Apparatus for Takin and Viewing or Exhibiting Cinematographic Pictures." G. F. HATTO

SHUTTERS.—No. 23,440. "Improvements in Means for Regulating the Spee of Photographic Shutters and the like." J. TOWNLEY.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notic is taken of communications unless the names and addresses of the writers a given.*

*** *We do not undertake responsibility for the opinions expressed by ou correspondents.*

STEINHEIL'S COPYING LENSES.

To the EDITORS.

GENTLEMEN,—I should be much obliged if you would kindly permi me to correct an error in the report, which was given in your last issue of the few remarks I made at the London and Provincial Photographi Association concerning Steinheil's wide-angle aplanatic copying lense These lenses are known as Series VI., not Series V., as reported. Ther is a Series V., also known as wide-angle aplanats, but the improvemen by introduction of another element into each combination, is confined t Series VI., of which I showed a specimen.—I am, yours, &c.,

P. EVERITT.

88, Evering-road, N., December 31, 1900.

THE HISTORY OF GELATINO-CHLORIDE P.O.P.

To the EDITORS.

GENTLEMEN,—Under the above heading, Mr. Joseph Barker contr butes to this year's ALMANAC a note which, I think, draws attention t a matter upon which we must all agree, and that is "the extraordina misstatements made by some persons who profess to write the histo of gelatino-chloride P.O.P." He also emphasises the desirability placing on record in some authoritative medium actual facts, and ther fore I crave a small corner of your valuable space.

Personally, I do not think that any one man can ever write photo graphic history. It writes itself, or is written by the many in th pages of your JOURNAL and other photographic publications, and a that is left for the individual is to collate all the facts and diges them into a sequent whole. As this was my task last year in connectio with P.O.P., may I, in the interests of photographic truth, poin out one or two references which support Mr. Barker's first statemen quoted above?

1. Hardwich described a gelatino-citro-chloride process which wa used with the ordinary silver bath ("Journal" of the Photo. Soc. vol. iii. p. 6, 1856).

2. Humbert de Molard suggested the use of an emulsion of silve chloride in starch or gelatine and the use of an organic salt of silve ("Bulletin de la Société Française," 1855, p. 124).

3. Smith and Palmer suggested the same in the "Photographi News," 1865, December 9).

4. Sir W. Abney published his working formula in the "Photo graphic News," 1882, p. 300.

5. In 1884 Obernetter, of Munich, placed a gelatino-chloride P.O.P on the market. This was subsequently made by Bühler, of Mannhei (Eder's "Handbuch," vol. iv. p. 163).

6. Mr. Barker publishes his formula, February and March, 1885.

7. Mr. Satchfield places the paper on the market (THE BRITIS JOURNAL OF PHOTOGRAPHY, March 20, 1885).

The rest of the story is fairly within the knowledge of all.—I am yours, &c.,

E. J. WALL.

December 31.

A NEW PIGMENT PROCESS (?).

To the EDITORS.

GENTLEMEN,—Last week you described a process that has recently been patented by a well-known German company, which is termed a "new pigment process." There is no question that the term is a misnomer. It is no more a pigment process than is the silver or platinotype processes, unless we consider the reduced gold, silver, or platinum as pigments. What is generally accepted and considered as a pigment process is one in which a pigment, as a pigment, is added to a vehicle rendered sensitive to light and which ultimately forms the image, as in the carbon or the gum-bichromate processes. The process, as described, is a bichromate process in which the printed picture is developed with different reducing agents. The theory of the process is this: The chromium dioxide, which is left in the image after the free bichromate has been washed out, is a strong oxidising agent, and converts certain colourless organic compounds of the aromatic series, by oxidation, into colouring matters of various shades. This principle is by no means new, and processes have been worked out based upon it. But they have not been put to any practical account. In one of the processes I have in mind, some excellent results were obtained a few years ago, but it was found that they would not stand any long exposure to light without a marked change. It will be interesting to learn if the process just devised will yield results that will prove more stable than those referred to. As I have just said, the term new pigment process is a misnomer, and what is more, it is misleading. A better name would be a new bichromate process.

In the very earliest days of photography considerable attention was given to the oxidising action of the chromic acid in bichromate image. It was in the early "forties" that Mons. Becquerel published some investigations into the action of the chromic acid on organic compounds, some of which are very interesting now that the bichromate is so much used in photographic processes. Becquerel took paper and sized it with starch, and when dry immersed it in a very dilute alcoholic solution of iodine which gave it a fine blue tint. Then, after washing and drying, the paper was sensitised in a strong solution of bichromate of potash and when dry was ready for exposure. After exposure the print was washed and dried, and afterwards put again in the iodine solution, which strengthens the blue image. While wet the picture is a fine blue, but when dry it becomes a deep violet. Hunt, about the same time, published his chromotype process, also based upon the oxidising properties of the chromic acid. Briefly, Hunt's process was this: The paper was sensitised with a solution of bichromate of potash containing a little sulphate of copper, and dried. When exposed under a negative the first change was to a dull brown, but if the action of light were continued the browning gave way and a yellow picture on a white ground was obtained. It was then treated with nitrate of silver or nitrate of mercury, and a good colour resulted. Several modifications of these processes are given in Hunt's early works on photography, all of which are very interesting reading at the present time.—I am, yours, &c., J. R. HOPWOOD, Ph.D.

December 29, 1900.

LEGITIMACY OF TRADING.

To the EDITORS.

GENTLEMEN,—Several years ago you called attention to the fact that weekly papers have been advertising that, for a few shillings—six, if I remember rightly—and a photograph, they would supply an enlargement such as, it was alleged, would be charged a couple of guineas for by an ordinary photographer. I now notice that one of the halfpenny evening papers is announcing that it is now supplying enlargements. The advertisement is headed "To Amateur Photographers," and says that many of its readers "indulge in this pleasant hobby, and who are possessed of a satisfactory portrait negative," &c. The advertisement goes on to say that, by forwarding a photograph "with a fair amount of detail and contrast" and six-and-ninepence, a beautiful and life-like enlargement will be sent within fourteen days. One paragraph of the advertisement is so very amusing that I quote it in full:—"The —— portrait never fades. The celebrated air-brush process, by which the enlargement is made, renders it proof against the ravages of light, air, and time." Many would be interested to learn how an enlargement is produced by the "celebrated air-brush process." The advertisement proceeds to say that suitable frames are supplied for the portraits for ten shillings each, and they are "of the best gold work or open ivory." I wonder how many amateur photographers will send their photographs and their money? Others, knowing nothing of photography, may. But, I ask, is this legitimate trading? Perhaps it may be, seeing that some of the leading newspapers of the day are competing with the booksellers by supplying certain enclycopædias and standard works for less than their original price, and which may be paid for by instalments. If it is with leading daily papers and books it may be with halfpenny papers and photographs. There is an old saying, "Let the cobbler stick to his last," and many may think that the newspapers should keep to their legitimate business and leave other trades alone.—I am, yours, &c.,

A TRADE ENLARGER.

January 1, 1901.

TONING PLATINOTYPES.

To the EDITORS.

GENTLEMEN,—More than once you have commented upon the toning of platinum pictures with reference to the stability of the tones obtained by the treatment. In Eder's "Jahrbuch" are given methods of intensifying and also modifying the colour of platinotypes, which you briefly referred to last week. These methods are based upon first depositing upon the platinum image a layer of silver and then toning that with platinum. The methods described for producing different colours are very similar. The silver is deposited first, and is then toned with uranium, with different variations, in the same way that like colours may be obtained on gelatino-bromide pictures. Most of us know the doubtful permanence of the colour got when silver prints are obtained with uranium. Now the question arises, Will the colours, blue, green, red, &c., prove any more stable on the platinum image than they do on the silver one pure and simple, seeing that the colours obtained are due to the silver substratum, so to speak, and not to the platinum base? It may be said that if these uranium-silver colours fade, the original platinum image, which is undoubtedly permanent, will remain. But will it in its pristine condition? When a silver picture, whether toned with uranium or by any other means, fades, does it leave white paper behind?

Can we, therefore, assume that the colours obtained by the different methods described with the uranium salt on the platinum-cum-silver image will prove more permanent than those on the silver image pure and simple? or that, if it fades, it will leave the platinum picture in its original beauty? It is an interesting point to decide.—I am, yours, &c.,

A LOVER OF PLATINOTYPE.

January 1, 1901.

A WAGES QUESTION.

To the EDITORS.

GENTLEMEN,—In THE BRITISH JOURNAL OF PHOTOGRAPHY of the 21st ult. I notice, in the Answers to Correspondents' column, that you consider £3 3s. a fair wage for a skilled operator in reducing, enlarging, photo-litho transfer, printing on metal, retouching, and large sun prints by the blue, black, white, and other processes.

Surely a mistake has been made as to the salary.

I myself work for a large firm in the City from 10 a.m. to 5 p.m. I only do ordinary work, *e.g.*, enlarging, reducing, and all kinds of outdoor work, developing and printing, &c., and my salary is twice that amount, with no work on Saturdays, and do not consider I am overpaid.

I write this, as I am certain you have very much under-estimated the services of such a skilled operator.—I am, yours, &c., COMYN.

[We heartily congratulate our correspondent on the salary he receives and the short hours he works, and we should strongly advise him, as the labour market now is, not to relinquish his present engagement, unless he is sure of a better. EDS.]

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In your issue of December 21 Mr. Howard Farmer asks if Mr. Ives can support his claim to the principle that with any trichromatic process the densities of the negative colour records must correspond quantitatively with Professor Maxwell's colour mixture curves.

I venture to say that this claim is unsupportable, and state my reasons below.

Maxwell, by empirical methods, found three hues in the spectrum, which when combined in appropriate proportions would counterfeit (approximately) all spectrum hues, white and the purples, in their three attributes, hue. luminosity, and purity.

Synthetical.	Printing.
Ives, in his kromskop, employed substantially Maxwell's reproduction colours, and adopted the latter's curves in the making of the colour record negatives.	It has been customary to employ Maxwell's curves for the record negative-making in three-colour printing, using pigments of complementary or minus (−) hue to those employed by Maxwell.
. . . . .	. . . . .
In counterfeiting the spectrum colours by the kromskop the process is substantially a re-performance of Maxwell's experiments, and his curves foretell what colours result from mixtures of his three reproduction hues.	Here, further analogy to the Kromskop method ceases, for the colours resulting from pigmentary mixtures are not necessarily those which would be deduced from Maxwell's curves. What colours (in hue, luminosity, and purity) actually do result from mixtures of pigments can only be determined by trial under the conditions of actual typographic printing.

To secure correct or approximately correct reproduction in colours by three (or more) pigments, Maxwell's curves are not suitable, but in their stead curves derived from actual mixtures of properly-chosen pigments, made under the usual working conditions (screen negatives, &c., and typographic printing) should be used.

I have no hesitation in saying that to use Maxwell's curves for printing is wrong, both in principle and practice, and I think this incorrect principle is a barrier to the progress of this, the most important branch of three-colour work, and that it should no longer go unquestioned — I am, yours, &c.,

ALEXANDER A. K. TALLENT.

December, 1900.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

A. W. HICKS (Plymouth).—A slip of the pen; another instrument was meant.

ANGLO-CELTIC.—We will endeavour to obtain the information for you by an early date.

J. E. T.—We are very much obliged for your letter, but the matter is not one that we can interfere with. The suggestion of favouritism is, of course, absurd.

STRIPPING GELATINO PRINTS.—"W. J." asks: "What date did you publish an article on stripping gelatine prints?"—In reply: The JOURNAL of January 29, 1897, contains an exhaustive article on the subject by Mr. H. Hands.

VARNISH FOR LANTERN SLIDES.—"J. H." writes: "I shall be glad if you will kindly tell me in next number the proper varnish (ready-made) for lantern slides. I am wanting to colour some."—In reply: Any of the varnishes sold for varnishing negatives will answer. Probably the best way will be to colour the slides first and varnish them afterwards, if the plates are treated with alum or formalin beforehand.

SILVER STAINS IN NEGATIVES.—"M. W. S." writes: "I should be obliged if you could tell me how to remove red silver stains from negatives. The negative is unvarnished. Would turpentine be of any use? As the negative is retouched, I don't want to use a bath that would destroy the retouching."—In reply: Tincture of iodine, followed by a solution of hyposulphite of soda, will, doubtless, remove the stains if they are merely superficial. If they are under the retouching medium, that must be removed first to allow of free action. Then, of course, the retouching will also be removed.

ELECTRIC LIGHTING IN STUDIOS.—"ARC" asks: "1. Is the electric light (arc) a success for general portraiture for interior studios? 2. Can good lighting be obtained, groups and single figures? 3. About how do exposures average, comparing with good skylight studio? 4. Is electric lighting much in use in London studios?"—In reply: 1. As regards the quality of the results, yes. 2. Undoubtedly. 3. Appreciably longer. We ourselves have sat ten seconds to a c.p. of 10,000. In good diffused light, all else being equal, we should not expect to sit more than half that time. 4. Yes; but by no means so largely as once was thought likely.

TRANSFERRING FILMS.—C. E. CHIRNEY asks: "How can I transfer the film from P.O.P. bromide and plationtype photos on to glass or celluloid without leaving any trace of the paper or damaging the film?"—In reply: We regret we cannot say. In the case of the platinotype there is practically no film to transfer, and the same may, to some extent, be said with regard to bromides. If the picture be cemented to the glass or celluloid the paper may be removed mechanically, as in the so-called Crystoleum process, but it will leave traces of the paper behind.

FLASHLIGHT POWDER, &c.—"COSMOS" writes: "1. Will you kindly give me a formula for a rapid flashlight powder, one rapid enough to light on passing through a flame. I am quite aware it will be explosive and want handling carefully. 2. Can you tell me where I could get it mixed, or buy one ready for use? 3. Can you tell me a development printing process which will give results to look like P.O.P.?"—In reply: 1. If magnesium powder by itself is passed through a flame no addition to it is necessary. 2. Messrs. Fuerst Bros., 17, Philpot-lane, E.C., supply a flashlight powder and cartridges ready for use. 3. The Velox glossy and similar papers will yield similar results to P.O.P. if developed with the usual metol hydroquinone developer.

BOOK ON THE GUM-BICHROMATE PROCESS.—"PYRO" writes: "When visiting the recent photographic exhibitions at the New and Dudley Galleries I was struck with the effect obtained by what I believe is called the 'Gum process.' I shall be indebted to you if you could inform me whether any book is published on the rocess, and also whether any articles have appeared on it in your JOURNAL. I am anxious to try the process, and any information you can give me as to where the materials are to be obtained and best book to be studied I shall be obliged for."—In reply: Messrs. Iliffe, of 3, St. Bride-street, E.C., publish a little book on the subject by the late Mr. Warren. If our correspondent can obtain access to the volumes of the JOURNAL and the ALMANAC for the last few years he will find many articles printed therein on gum-bichromate printing. Mr. Packham's paper on the subject is particularly valuable.

VARIOUS QUERIES.—"UMTALI" writes: "1. Re Formalin. I am unable to find particulars of how and in what proportions this acknowledged "anti-friller" should be used. In this hot climate, with water frequently at a temperature of 85° to 95° F., it would be invaluable, but experiments to date are far from satisfactory. Will you, through the medium of your paper, kindly inform me? 2. Re advertisement in one of your recent issues of a self-toning gelatino-chloride paper, which merely requires fixing in a hypo bath, will you, please, give me the name of the maker, so that I may order samples for trial? 3. Re Annual. Do you bring out a binding suitable for this book of yours? Also, have you binding files for your weekly issue of the JOURNAL? 4. It was my intention to put in a paper, subject to your approval, for your 1901 Annual; but I find I have left the matter too long, so must postpone my endeavours till some future occasion. Meanwhile, I should be glad to hear from you whether such a paper, giving my experiences as an amateur self-converted into a professional, and the difficulties to contend with in a climate like this, would be considered of sufficient interest to your readers to be worthy of inclusion in your valuable ALMANAC, or, perhaps, weekly issue."—In reply: 1. Messrs. Schering recommend one part of formalin to nine of water, the plate to remain in the solution for five to ten minutes. 2. Messrs. Houghton and Sons, High Holborn, and Sichel and Co., Bunhill-row, E.C., both supply self-toning papers. 3. The ALMANAC is sold bound in cloth; cases for binding the JOURNAL are also sold. 4. We shall be pleased to see the article.

A QUESTION OF CHARGES.—"LEX" writes: "I am managing a business, and should be very glad with your opinion on the following: Being friendly with the secretary of the Cricket Club, I asked him early in 1899 if he could arrange for me to photograph the team. He made an appointment for me for a Saturday afternoon, but when I got to the ground I found the match was scratched and nobody present. The secretary then arranged for the last match of the season, but on this occasion barely half the team turned up. Another date was fixed this season, but the team only turned up in time to jump in their brake to go to the ground on which they were playing that day. Now I am coming to my special point. After giving me all this trouble for nothing the secretary and captain both said, You photograph the 'A' team this afternoon, which is playing here, and we will be done next week. I did so, and the first XI. the following Saturday. I submitted proofs but the orders amounted to five of the first XI. and none of the 'A' team, which was really a scratch eleven. The groups were good, and they find no fault with same. I sent in a bill for five 12 × 10's of first XI., 17s. 6d., as this was taken as my own speculation, but I charged 10s. for proof of 'A' team, as this was ordered by secretary and captain. The Committee repudiate liability for the 10s. for 'A' team. It is not worth sueing for, for it would do more harm than good, but I told my friend, the secretary, I would write you on the matter, and should be much obliged with your opinion."—In reply: It is clear that, notwithstanding the trouble involved, the first group was taken as a speculation, and it would seem that the secretary and captain might fairly assume that the second would be taken on the same terms. If, however, they distinctly ordered, on their own behalf, the second to be taken, then they are responsible for the charge. It is simply a question as to under what arrangement the second picture was taken.

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EX CATHEDRÂ.

The R.P.S. Elections. With the last number of the Royal Photographic Society's Journal there was issued the form of nomination for the annual elections. The form provides spaces for the names of a President; four Vice-Presidents; a Treasurer; and 20 members of Council; whilst members are also asked to nominate five judges in the pictorial section and three in the technical and scientific. This form is returnable to the Secretary of the Society at 66, Russell-square, W.C., not later than January 18th. It is the custom of many members to neglect opening their copies of the Society's journal for a considerable time, and we have met with cases where the covers are never removed at all, so that this reminder of the imminent election may serve the purpose of inducing a number of members to take more interest in the matter than hitherto. With regard to the nominations for Council, those members at a distance who may require guidance in the choice of names can hardly err if they take the existing list and transfer it bodily to the paper that has to be filled up. During the past year the business of the Society has been very well managed indeed, a fact so patent as to constitute an entirely conclusive argument in favour of retaining the present executive. Beyond this we do not think the existing condition of affairs in the Society calls for particular reference. The nomination paper, as we have already mentioned, invites members to submit the names of eight judges for the Annual Exhibition. Possibly the balloting list will supply occasion for discussing this part of the electoral contest, if contest there be.

* * *

The Illustrated Press Bureau. We are indebted to Mr. Snowden Ward for drawing our attention to the Illustrated Press Bureau, Limited, 10, Norfolk-street, Strand, of which he is one of the directors. Mr. Ward says: "I have long taken an interest in fostering the connection between photographers and the illustrated press, and during the past few years have introduced many photographic workers to editors prepared to purchase their rights. Within the past few months, experience gained from the correspondence in connection with 'An Index of Standard Photograms,' has shown me how many photographers, especially those in the British provinces and abroad, find it difficult to get into profitable touch with the illustrated press. I have, therefore, every reason to believe in associating myself with Mr. Robert McClure and Mr. Sibthorp, who already have very extensive connections (as literary agents) with the illustrated press both in Britain and America, that we may be able to establish an agency which will be of great use to many photographers, as well as to editors using illustrated matter." According to the prospectus, a copy of which Mr. Ward sends us, the Bureau acts as agent between photographers who have subjects suitable for reproduction in the illustrated press, in book illustration, &c., and the editors and publishers of illustrated

matter. We have read this document through, and the Bureau strikes us as having many features of which photographers working for the press might profitably avail themselves. A copy can be obtained at the address given above.

* * *

The Artists' Trade Union. A great deal has recently been said about a proposed Artists' Association, of which Sir Lawrence Alma Tadema is, or is to be, President. The matter is of interest to photographers in one respect only, namely, the system, openly jeered at as "delightful in its *naïve* simplicity," by which the Association is to assist its members to sell their pictures by keeping on hand a selected stock of photographs therefrom. This scheme is widely condemned on the ground that it will confer tangible benefit on no one save its salaried officials, a by no means uncommon state of affairs in other societies, as is only too well known. There is something funny in the idea of painters sending out pattern-books of photographs for would-be purchasers of masterpieces to select from. It would be interesting to know who would take the photographs, and in whom the copyright would be vested. The painters themselves? Granting the affirmative in both cases, would Sir Lawrence Alma Tadema and his friends—who are known to be opponents of photographic copyright—submit to compulsory registration and the other provisions of some one of Mr. Scrutton's various little Bills? If the Artists' Trade Union came to a head the painters and others would be going into business as photographers, in which case it would be instructive to have their views on photographic copyright generally. But ridicule has already marked the Artists' Trade Union for its own, and it is waste of time to make it the object of further speculation. We note, by the way, that the St. John's Wood Art Club has moved into new quarters, and is flourishing. In this Club we take a most tender interest, for it is the hatchery, if we are not misinformed, of the various photographic copyright bills that we have criticised in these pages for several years past. We wish the Club well, and we suggest that for the future it can find far more useful work of its own to do than meddling with matters that do not concern it—photographic copyright, to wit.

* * *

Which should be Boycotted? This is a question put to us by Mr. Garner, photographer, of London-road, Southwark, who in his letter encloses documents which offer us the choice between the industrious M. "Tanquerey" of Paris, and the magazine "Spare Moments." If "Tanquerey" got his desserts his fate would be something less pleasant than mere boycotting, no doubt. But to the magazine and its alleged offence, which is simply the cheap enlargement device over again. "We have made arrangements by which we are in a position to supply beautiful enlargements from any photograph sent to us for the sum of 4s. 6d. each, post free. The enlargements will be done in first-class style, and will measure 12 in. by 10 in. They will be mounted on best plate-sunk boards, measuring 18 in. by 14 in., and will undoubtedly be admired by all friends. Readers who have lost dear relatives or friends will find this a splendid opportunity for obtaining an enlarged photograph of the departed ones at a very small cost. They will also be found useful as gifts, being much more acceptable than an ordinary carte de visite photo, while they cost very little more." Frankly, we see nothing to complain of in this. We know the kind of work offered. It is worth what is asked for it, no more, no less. There is no misrepresentation about the matter, and the magazine does not tell its readers that these four-and-sixpenny bromides would cost a guinea and a half or two guineas at a photographer's, a species of sheer mendacity of which only too many newspapers that we could name have been guilty. It is unfortunate that photographers have to submit to the competition of magazines and newspapers, but it cannot be helped, and it is useless to repine at such things. Let the photographer, however, ignore these machine-made enlargements, and give his sitters "of his best," and of photography's best—cheaply and in variety, and he will have no time to spend in useless lamentations.

* * *

"The Ideal Guide Book." Messrs. C. Arthur Pearson, the well-known publishers, write us:—"The author and illustrator of a new guide-book to Bournemouth which we have just brought out, has drawn our attention to an article in your paper of November 2, in which you discuss 'The Ideal Guide-Book.' Curiously enough, this guide-book, which is the first of a series we are going to issue, has been prepared on almost exactly the lines of the article referred to. Mr. Clive Holland is a local man, and you will see, from the copy of the guide-book we send you herewith, is an excellent photographer. We shall be interested to know if you consider it comes up to the standard which the article sets up." Not quite; for, though Mr. Clive Holland, whose work we have seen before, is a very good photographer, the half-tones in the book before us do not flatter his negatives. But the book generally is well done. We know the whole of the ground, and Mr. Clive Holland makes a good guide. In the matter of illustrations for such work as that under notice, it is surprising that collotype is not more largely employed than it is. The process is cheap to work, and the pictures can be printed in the letterpress. We thank Messrs. Pearson for drawing our attention to this matter.

* * *

"Punch" and Photography. The retirement of Sir John Tenniel from the position of chief cartoonist to "Punch" has brought out again some details of the extent to which he and his fellow-artists relied upon photography for the execution of their drawings. In the "History of Punch" Tenniel is quoted as saying: "As I never have a model, I never draw from life, but always, when I want a portrait, a uniform, and so on, from a photograph, though not in quite the same spirit as Sambourne does. I get a photograph only of the man I want to draw, and seek to get his character. . ." Mr. Sambourne, Tenniel's successor, makes a far greater use of photography. No chemical professor dealing with formulæ could be more intensely accurate. His cabinet contains over ten thousand photographs of every obtainable personality, and of every possible person

or object in science, art, or literature. "From a Weasel to a Welshman" is his own description of his comprehensive collection. If we read aright, the whole of Mr. Punch's illustrations will in future be "processed," and thus the very last vestige of hand-engraved block work will disappear with Tenniel. There is something mildly retributive in all this. In the earlier days of photography *Mr. Punch* poked much fun, somewhat acid in nature it must be allowed, at the photographer and his art, but Time in its revenges has ordained that in the production of the paper the services of the much-derided person, who once wore, but no longer wears, a black coat and long hair, in admirable imitation of his "artist brother," should be called into considerable requisition. By the way, Mr. Sambourne—may we soon call him "Sir Linley"—has been a photographer for many years, and was one of the early members of the Camera Club.

STUDIO BACKGROUNDS AND THEIR SUPPORTS.

As it has been suggested to us that our articles referring to studio construction would be rendered still more useful by a chapter on backgrounds, we have pleasure in carrying out the suggestion, though the catalogues of the dealers in photographic apparatus contain very complete details of many varieties of backgrounds and stands. Time was when methods of producing these from home-made materials were popular and useful, and full instructions will be found in past volumes of our JOURNAL, but they are now to be purchased in various tints and of excellent quality at prices which are probably less than the cost entailed by purchasing the necessary cloth, colours, size, and brushes for making them at home. A glance at the lists will show, for example, that for three or four shillings a ground large enough for busts and half-lengths may be purchased, and, moreover, they will be both durable and useful—capable of being used on either side, and readily cleansed with soap and water. In the days when carte-de-visite mania was in full swing all—or virtually all—the picture backgrounds were produced by one manufacturer, but such are the mutations of business that his name is now a memory only, and they can be had from quite a number of scene-painters, British, American, and Continental. Stands, too, of most ingenious construction, for holding as many as a dozen different backgrounds at once, while yet occupying scarcely any space, are on the market. It is not our province to describe these; we merely refer our readers to the advertisement pages of our JOURNAL, or of our ALMANAC, as we take it that what is asked of us is something not to be found in these catalogues. Questions of economy and questions of space have often both to be considered when arranging for a variety in plain and in picture grounds; and, taking the former first, it may be said that the cheapest way of all is to provide each painted sheet—plain or picture—with a stout lath for the top, and a special stout roller, seven or eight inches wider than the sheet, for the bottom. A single or a double pulley-wheel, fastened to the lath, and a cord to each end of the roller, will enable it to be wound and unwound like a theatrical drop-scene with ready facility. A simple support can be secured to the wall for holding one or other of these; or two longer arms projecting upwards at an angle, and with a series of slots cut in to receive the laths referred to, the object of putting the supporting arms at a slant being to avoid one background on roller throwing a shadow over another when let down. But, wherever it is possible, it is far better to invest in one of those most ingenious stands on castors for holding a number that can be nowadays so readily purchased at almost any dealer's.

There is a further advantage in these stands which is not always appreciated as it should be. By reason of their portability they can be placed at any angle to the light, and thus made to come out in the negative either light or dark as may be found desirable. This is a most important point, though one often lost sight of, or unknown. Backgrounds suspended in this manner are not injured when by accident they are pushed or receive a blow from any hard object, such as a head-rest (if this instrument is ever now used) or piece of furniture. This is perhaps the only point of superiority over still another way of supporting them—perhaps the most luxurious—that is to say, stretching them on to frames like an artist's canvas. They are then very portable, always ready to use, and, when properly stretched, rigid and taut as a drum and entirely free from creases and fold marks, which too often disfigure otherwise pictures when they at once betray themselves as paintings and not nature. There is, however, an easy way of so treating a framed ground that it will withstand a heavy blow without receiving a mark. The method is to strain on the frame a piece of cheap calico, and then to paste upon the canvas successive layers of paper—three or even four may be given—letting each dry before putting on the final layer. The result is, when the whole is dry and set, a coating, which is virtually a piece of cardboard; it then forms a splendid support, against which any scene may be secured with tacks, and rendered almost secure against violence. A word of advice may be here given: the framework can be coated on each side, and so hold two views, or one picture and one plain ground, and these two coatings help one another, inasmuch as, unless the frame be very strong, the shrinking of the paper when drying tight, will be so great that it will twist and warp the wood framework. These frames, to be well made, and supplied with cross-bars to distribute the strain, work out rather costly even when made by a local carpenter. Perhaps the simplest plan, and certainly the best as regards a combination of strength and lightness, is to purchase these frames ready-made at the artists' colourman's. They can be had in a large variety of sizes, and they travel easily, seeing that when sent out they are not put together, yet they are so well made and finished that a child might put them together into a solid, substantial frame, and they need neither screws nor nails to secure them in position when built up. Frames of this kind, when of large size, cannot be moved from one part of the studio to another single-handed; hence they are infinitely more useful when supplied with feet and furniture castors. The feet need not be more than twelve inches wide, and thus a series of frames can be "nested," as it were (the feet of one being alternately inside and outside those of the next one), the space occupied being then not more than about seven or eight inches. We may finish our chapter on backgrounds by this description of what, where there is space to use it, is perhaps the acme of perfection and luxury in background supports.

THE PERMANENCY OF TONED BROMIDE PRINTS.

THE toning of bromide prints appears to be a matter of general interest for the moment, and some personal experiences of non-permanent and apparently permanent uranium-toned images may not be out of place. There is a general agreement to the effect that the result of uranium toning is, as a rule, not permanent, but I have no doubt that many besides myself have some few toned prints that show no signs of deterioration beyond, perhaps, a slight variation in colour. If a print that originally was a bright red brown simply softens down in course of time into a quieter brown, there is nothing much to complain of; certainly not enough to condemn the toning process. But when the red-brown changes in patches into the silvery-grey metallic deposit that characterises the spoilt uranium-toned image, the matter is serious enough to induce one to drop uranium toning altogether, were it not for the fact that this result, though common, does not appear to be inevitable.

In the extract from Herr Gædicke's article given in THE BRITISH JOURNAL for January 4, it is stated that "there remains in the picture a light sensitive silver compound, the presence of which ought not to be ignored." This, at once, suggests the idea that permanency may result if the "light sensitive silver compound" is removed from the print, and I am very much inclined to think that such of my prints as have proved permanent, owe their permanency partly to the fact that such a "fixing" process has been carried out. I may as well state here that the prints in question have had a life of between seven and eight years; a period which is, perhaps, sufficiently long to warrant the use of the expression "permanent." The non-permanent prints did not reveal their true character until about two years had elapsed, and therefore I take that period to be the shortest allowable for a fair test of permanency.

While at work on these prints I made a small discovery with regard to the removal of the usual yellow stain from the whites of the prints. I believe that I was the first to draw attention to the fact that a little ammonium sulphocyanide in the first washing water, used after toning, removed the yellow stain instantly, thus obviating the risk of washing away the toning deposit; and that it further improved the tone of the image. With few exceptions all my prints have been treated in this way. The sulphocyanide bath very slightly reddens the tone, and hence it was omitted in cases where deep brown tones were desired, and used in greater strength and for a longer time when warmer tones were aimed at.

Some of the prints were not only treated to the sulphocyanide bath but were toned in a bath containing some of the same salt in addition to the uranium and ferricyanide.* Some of these again were finally treated in a reducing bath, consisting either of strong sulphocyanide solution, or a mixture of sulphocyanide and ferricyanide to further redden the tone; and in one print an endeavour was made to completely remove the whole of the silver by prolonged reduction so as to leave only the uranium image. The result in the last case was very successful, and a well-known judge was afterwards heard to refer to this print as a specimen of the carbon process!

The prints were eight in number, and four of them have been framed and hung fully exposed to light for at least seven years. The other four were wrapped in paper and kept in a drawer in a room that is not altogether free from damp. The whole of the eight prints have become slightly softer in tone, they have darkened slightly, and the greatest effect seems to have been produced in one of those kept in the drawer, this one being the print from which the whole of the silver has been presumably removed in the reducing bath. The tone has decidedly improved, but evidently the effect is not due to the action of light. This alteration of tone is the first point worthy of notice. The second is that three of the four prints exposed to light are spoilt by the peculiar metallic deposit before referred to, while only one of the four kept in darkness shows the slightest trace of deterioration. In this case there is a speck about the size of a pin's head in each corner of the print. Evidently, while light is the main cause of deterioration, it is not the only cause. All the prints are in cut-out mounts, and in each spoilt print the deposit commenced in the corners and spread inwards, affecting first the denser portions of the image. The reason of this progressive spreading from the edges is not at all clear.* It is not due to gas fumes, for the worst prints are in a room in which the gas is seldom lighted; while the one print that has escaped altogether (together with one that is only partially spoilt), hangs in a room that is in constant use, and, further, it hangs high up on the wall, just where it would be likely to receive the greatest possible effect from the gas. It would seem that either the mount or the mountant must be in some way responsible for the effect, but there is not much reason to suspect either. The immunity of the one picture is remarkable; for, though it is true that strong sunlight never enters the room, yet the companion picture has not escaped. There is only one explanation to offer; the immune picture was very thoroughly treated with a sulphocyanide bath which, no doubt, removed the sensitive silver salts, and, some ferricyanide being present, most probably some of the silver as well; while the other picture was only very lightly and superficially toned so as to produce a deep brown, and received no after treatment. The two worst pictures are deeply toned, but were not reduced to any extent, being only momentarily treated with weak sulphocyanide baths to remove the yellow stain; further, they have been hanging in a strong South light, though in a purer atmosphere.

Of the pictures which have been kept in the dark, the one that shows faint traces of deterioration is another example of an attempt to secure a deep brown tone by very slight surface toning of the silver image and no after treatment.

One of the remaining three (which are all still perfect) was very thoroughly toned and then treated with a strong sulpho-ferricyanide reducer to remove the silver. The others were deeply toned, and afterwards only treated with weak sulphocyanide, and I attribute their preservation to the absence of light. Three of these prints have recently been hung in a well-lighted room, and so their permanency in light will now be severely tested.

I am inclined to think that the combination of metallic silver with the uranium salt is nearly as undesirable as the presence of sensitive silver salts, and that the removal of both silver and silver salts is advisable. If this course is adopted, the toning must be very thorough, and is best carried out with very dilute solutions. A strong solution does not readily penetrate the deeper shadows; which fact is likely to be painfully apparent on the application of the reducing bath.

A little sulphocyanide in the toning bath is an advantage if after reduction is intended. The hypo-ferricyanide reducer should not be used, the sulpho-ferricyanide bath is the best for the purpose.

Superficial surface toning has proved non-permanent, but whether this is due to the non-use of the reducing bath, or to the tenuity of the deposit is not clear. Its abolition would deprive us of some very pleasing tones.

By twice toning (that is, first toning in the ordinary way, then removing the tone with ammonia and retoning), deeper purplish browns may be obtained. Possibly this produces an excess of sensitive silver compounds; any way, as some of the toned prints that have come to grief were treated in this manner, the process is apparently an undesirable one. One print that was first of all toned, and then "untoned" with ammonia, and allowed to remain in that condition, shows no signs of any sort of deterioration, though the image very probably contains some silver salts in addition to the metal, and has been fully exposed to the light.

To sum up; the history of my own prints appears to indicate that a reducing bath may be used to "fix" the uranium image and render it permanent, even if exposed to light. It would be interesting to know if any one else can confirm this hypothesis; and if he can also state what reducer was employed it will be possible to arrive at some conclusion as to whether the removal of the silver salts alone is sufficient, or if the silver must go as well.

It is somewhat curious that uranium-toned lantern slides seem less permanent than the prints, even though kept in the dark. This is an unfortunate fact which throws doubt on the possibility of in any way securing really permanent tones in the prints. It may, however, be partly due to the presence of an excess of moisture in the thicker

* This process was described in *Photography Annual* for 1894.

* In no case is the centre of the picture affected. In two cases the corners and margins are spoilt; in the third, only one lower corner.

gelatine film. The removal of the silver by a reducer certainly tends to produce more permanent slides, but, still, I have no slides that have kept as well as the prints before referred to.

With regard to the permanence of copper-toned prints it seems to me that we had better wait another year or so before expressing an opinion. It appears, however, that, if a reducing or fixing bath is required with uranium-toned prints, it is likely to be equally desirable with any other form of toning with ferricyanides; but further evidence on this point, beyond that which I have given from my own limited experience, is very desirable. A point of some interest is the nature of the metallic deposit on spoilt uranium prints. Probably some one has already examined this. C. WELBORNE PIPER.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

V. WILHELM ZENKER (*continued*).

ZENKER, as we should, on consideration, expect, divided his explanation into two parts.[1] "The process is explained, *physically*, by the formation of stationary waves; *chemically*, by the separation of metallic particles of silver from the silver chloride." We shall glance at these two divisions successively. The first part has a signification wider than its merely photochromatic one, and the discovery of standing waves might have been made independently of all photochromatic questions. Indeed, it is a corollary of the undulatory theory, and involves no hypothesis except that of the undulatory theory itself. With respect to the latter, it is the fact that in most (if not all) of the English presentations of the wave theory, and in some of the German ones, the main matters are obscured by a cloud of hypothesis, which probably (like atom theories) gave a rigid inquirer (to quote Hertz) like Gustav Kirchhoff positive pain. But this is not necessary; as science advances towards perfection, it becomes more and more possible to exhibit all "theories"[2] as expressions of, or mathematical consequences of the observed facts.[3] No more than this is to be expected in any science; and, so long as it does not come under this heading, we are and must remain *entirely*, not "*almost entirely*, in the dark as to what it is that vibrates and the manner of vibration."[4]

So much is necessary at least to indicate the grounds on which we regard the first part of the Zenker theory as beyond all possibility of objection. A full discussion of these grounds is a purely optical question; it would come to the same thing as a separation and enumeration of the observed experimental facts from which the fundamental equations of optics are concluded. Such a work would be, of course, of immense scientific importance; but the results no one could dream of doubting even at present; we are convinced of the necessity of the undulatory theory. We then only have to assume this, and this is practically proved for us; we are sure that it can be established on firm foundations, and so we (reluctantly, perhaps) dismiss further consideration of it. The perfect satisfaction of our needs and the final scattering of any of our lingering doubts we must hope that some physicist will undertake: the subject cannot further occupy us, whose business is with the *chemistry* of light.

Zenker's words (nearly the last ones of the *Lehrbuch*[5]) must be taken to apply to this first part of the theory principally; they put the thoughts which guided him in a clear light, and express the purpose of every "explanation" in science: "I am satisfied . . . . that . . . the facts of colour-reproduction can be easily reconciled with the general conceptions of the characteristics (Wesen) of colours. . . The phenomenon is no longer only wonderful and astonishing; it is one that, though in many points obscure, is now comprehensible and imaginable."

Finally, let us by all means, like Zenker, seek to advance science by *naive* images, mechanical models in our minds, of wave-motion and what not; but let us always remember that these are only justified as *Hilfsbegriffe*, and that the final tests of our results must be their expression in terms of the ground-facts of the science. The first part of Zenker's theory is capable of this expression; Zenker did not, could not at that time (1868), carry this out completely. We have tried to show that this is done by the undulatory theory, even when the latter is conceived in its strictest and probably unassailable form. Any objection to Zenker on this count is an objection against this theory

It remains to consider the second part of the theory, and to inquire into the questions which arise here, and which are of a wholly photochemical nature. That laminæ *are* produced in a Lippmann plate which is a very good realisation of the conditions required by Zenker's theory, is, to all intents and purposes, conclusively established by the very delicate photo-micrographic work of Dr. R. Neuhauss,[6] and thus that photographic action takes place intermittently along two interfering light-waves has been experimentally proved. This completes the verification of Zenker's theory in all respects but one minor one. Zenker, imaging light-waves as, we may say, *mechanical* undulations propagated in an elastic solid, concluded, naturally enough, that photographic action would result only at the points of vibration of interfering waves. The image of molecules being set in rapid motion by light-waves, and the chlorine atoms being thrown off owing to their inertia, is a coarse and perfectly arbitrary hypothesis, which may, in its time, have served some useful purpose as a guide (of a sort) to further discovery, but is now useless, and is yet unfortunately only too common among photographers. It cannot be justified in its inception on any scientific grounds, and, when conceived, is, by its nature, incapable of verification. It is not a description of a fact, and can never serve the purpose of advancing the science of photography. The true *science* of photography will begin when it is given a *quantitative* basis by *experiment*, then it will be possible to apply mathematical analysis, which, if the basis is sufficient, will include and co-ordinate all our positive knowledge of photographic phenomena. The only systematic attempt in this direction, so far as I am aware, is that of Lemoine.[7]

Into this digression I have thought it necessary to enter, as the hypothesis has apparently been sanctioned by authority as classifying ideas; a monstrous reason since the characteristic feature of a "hypothesis" is an illusory appearance of explanation—an illusion which should vanish at a consideration approaching profundity.

The "minor respect" alluded to above arose in a discussion at the Paris Academy of Sciences which followed an account of Herr Otto Wiener's memoir on the direction of vibration of polarised light,[8] by M. Cornu in (I think) 1891. The discussion took place between Cornu, Potier, and Poincaré; and Poincaré's remarks, especially, should occupy our attention in connexion with the final verification of Zenker's theory; but we shall in future endeavour to keep more strictly to historical sequence, and thus the further consideration of Poincaré's remarks must be deferred. We shall next attempt to fill up any gaps we have made in the order of historical developments.

PHILIP E. B. JOURDAIN.

[1] Result (7) in the summary at the end of the *Lehrbuch; Cam. Obsc.*, i. 355. I should mention that my references are to the pages (generally) of the *original* edition of the *Lehrbuch*, not to the new and excellent edition recently brought out.

[2] This word seems to be better expressed by the German "Lehre." I am accustomed to distinguish the words "theory" and "hypothesis." The latter is more or less arbitrary assumption of a property or of a "material" (such as "aether") which cannot be directly perceived, and is not a mathematical consequence of such a perception (evidently our knowledge, in its phenomenological aspect, can only rest on these two grounds); a "theory" is, on the contrary, such a body of knowledge, arranged in the manner which makes possible the greatest economy of thought. Newton's use of the word hypothesis, "Hypotheses non fingo," agrees with this.

[3] This assertion is directly opposed to the ideas and hopes of many English physicists. It is, however, based on views which are the outcome of the profound historical research and criticism instituted by E. Mach. Similar views have been expressed, in a more extensive and popular form than with Mach, by Professor Karl Pearson of University College, London, in his *Grammar of Science*.

[4] Lord Rayleigh, "Wave Theory of Light," *Encycl. Brit.*, 9th edition, xxiv. 421.

[5] *Cam. Obsc.*, i. 355.

[6] "Nachweis der dünnen Zenker'schen Blättchen in den nach Lippmann's Verfahren aufgenommenen Farbebildern.' *Wied. Ann.*, lxv., April 1898, 164–172.

[7] "Etudes quantitatives sur l'action chimique de la Lumière."—*Compt. Rend.*, cxii., 1891, 936–939, 992–995, and 1124–1127. There are, perhaps, others of M. Lemoine's papers which I have not yet seen.

[8] See THE BRITISH JOURNAL OF PHOTOGRAPHY, November 9, 1900, pp. 711, 712.

ABSTRACTING WATER FROM ALCOHOL.

It is surprising how many receipts as given in receipt books are handed down from generation to generation notwithstanding that they are quite impracticable when tried. At different times methods of strengthening alcohol have been given, such as putting the spirit in a bladder and suspending it in the sun, when, it is said, the water will pass through the bladder and evaporate, leaving the spirit behind. Another is that of putting gelatine in the spirit, when, it is said, it will absorb the water it contains, and so strengthen it. But those who have tried these methods know that they are of little avail for the purpose. At a meeting, a little while ago, of one of the London photographic societies this question came up, arising from the fact that one of the members had mentioned at a previous meeting that he had been in the habit of strengthening spirit by the latter method, which had been employed for drying negatives.

A gentleman who had experimented stated that he found that the spirit was not at all strengthened by the gelatine treatment, and that the gelatine remained, after several days' digestion, just as dry as when it was first put in. Now, both may be right, as much will depend upon the proportion of water in the spirit, to begin with. Gelatine is very absorbent of moisture, and if some thin flakes of it, after being made quite crisp by drying, be put in, say, a damp cellar, it will in a few days become soft; indeed, if the place is very damp, quite flabby. Alcohol also has a great affinity for water, as we know by the way it quickly absorbs it from a gelatine negative. Now, it is difficult to conceive how alcohol that has taken water from gelatine will give it up again to gelatine. But it is possible that under certain conditions it may.

If some thin flakes of gelatine be made "bone-dry" so that they cannot be bent without breaking, and digested for several days in the ordinary commercial methylated spirit, it will be found that they remain as dry and crisp as when they were first introduced, and the spirit is not strengthened at all; but, if the experiment be repeated with a mixture of spirit and water, in which the water largely predominates, the gelatine will become softened by the absorption of some of the water, and the spirit to an extent — though to a slight extent only — strengthened. Spirit that has been used for drying negatives can, however, be brought up to its original strength by shaking it up with some well-dried carbonate of potash. This will absorb the water and form a dense fluid at the bottom of the bottle, from which the spirit can be decanted for future use.

A. F. Whitworth.

POSITIVE PHOTOGRAPHY WITH SPECIAL REFERENCE TO ECLIPSE WORK.

[Reprinted from the *Transactions of the Academy of Science of St. Louis.*]

During the last year the writer has been making an attempt to adapt the process of positive photography to service in the two solar eclipses which occur during the next two years. The unusual duration of the period of totality in both makes them peculiarly favourable to the use of such a process. And, while this will also be to some extent an advantage in securing negatives, still an over-exposure is then always possible. When such over-exposure is corrected by the use of a restrainer, the effect is to dissolve away the very details which the long exposure was intended to secure.

By great over-exposure, in the old sense of the word, and development in the light instead of in the dark room, no over-exposure for positives is possible. The only limitation then is an under-exposure, which causes the positive picture to fog.

The object of the present paper is to give the present condition of the process, and to request any who may be able to do so to aid in so improving it, that the best results may be secured in these eclipses. There will be no other opportunity so favourable in the next generation.

Let the stop of the camera be set at No. 8 of the universal system. The ratio of the focal length divided by diameter is then

$$\frac{f}{d} = 4\sqrt{n} = \sqrt{8} = 11{\cdot}3.$$

If the object to be photographed is a landscape, consisting mainly of mid-summer foliage, and the plate be a fast plate, like the crown plate of Cramer, the exposure may be made two to four minutes in length. For the first attempt the latter interval is to be preferred. The exposure may be made as much longer as may be desired. It has been successfully tried with exposures of six and eight hours.

The plate is taken to the dark room, and is best developed by the light of a strong lamp. If the exposure has been not over two minutes, the best result will be obtained by placing the bath between two strong lamps. Two Argand or Rochester burners with porcelain shades in contact or nearly so, with the bath in a position of strongest illumination between and below the shades, is an admirable arrangement. The bath should be cool at the start, and it should be in ice-cold water during the development. The bath being rather weak, the development will go on very slowly.

Various developers have been tried. Pyro has given very poor results, although the same bath would yield brilliant negatives in the dark room. By far the best results have been reached by the use of Cramer's hydroquinone developer, the formula for which may be in every box of Cramer plates. The formula is:—

Solution No. 1.

Water	25	ounces,	1000	grammes.
Sulphite of soda	3	„	126	„
Hydroquinone	½	„	21	„

Solution No. 2.

Water	25	ounces,	1000	grammes.
Carbonate of soda	6	„	252	„

The two solutions are to be mixed in equal parts when used, and are to be diluted to from one-third to one-fifth strength. A few drops of ten per cent. solution of bromide will give brilliancy to the plate, but will not improve definition of details. The bromide may be left out.

In transferring the plate from the holder to the developing bath, it would seem to be somewhat better to turn the lamps down until the liquid covers the plate, but the light should then be turned on at once. When lamp light is used this precaution is not very important. In fact, the writer is inclined to say that such precaution is not then necessary. If the exposure has been too small, either from insufficient light on the objects or from insufficient time, such an exposure in the light room is a decided advantage. It carries the plate farther from the zero condition, and materially improves the picture. The same result may be secured by turning the camera upon the sky after the usual exposure to the object has been made, and before the shutter has been closed. This sky exposure may be for half a minute with a No. 8 stop, but should not exceed this. The following experiment seems to indicate that this sky exposure should be after rather than before the exposure to this object.

A white paper was pasted on a somewhat larger card of dead black It was placed against a brick wall in sunlight, and with a cloudless sky. After a minute of exposure to the plate in the camera, the black card was quickly shifted laterally by a distance slightly greater than its width. This was repeated ten times in an exposure of ten minutes. On developing, the first of the ten exposures was somewhat more distinct than those which followed, but between the others no difference could be detected. The last minute of the ten was as effective as the second. But, when the experiment is terminated at the end of the first minute, the image is very indistinct. It is evident that the subsequent exposure during the nine minutes served to make more distinct the image of the card made during the first minute. And, since the plate seems to be somewhat more sensitive at first than it is later in the exposure, it is better to utilise this part of the exposure in securing details of the object, rather than in fogging the plate beyond the zero condition. This difference of sensitiveness is not very marked. It is difficult to see any difference in the first three and the last three minutes of a six-minute exposure. This may be shown in an interesting way by the following experiment. The experimenter should preferably be dressed in light-coloured clothing, and should

train the camera on a grass-covered hill, which will serve as a background. Any other dark background will, of course, answer the purpose. After snapping open the shutter, walk to a point about 100 feet distant, the camera having been focussed for that distance, and stand motionless for two or three minutes. Then step sidewise four or five feet and stand for an equal time. Then walk back and close the shutter. The two figures will seem practically alike if the sunlight has not changed, and the darker background will not appreciably show through them. The plate will show no trace of the motions, and the figures will be as clear and distinct as in a good negative.

Of course the same thing can be done in the ordinary negative process by so arranging the conditions that the time of exposure is sufficiently lengthened.

In order to make the positive photography as useful as possible, it is necessary to find a developer which will bring out a clear positive with as small an exposure as possible. It seems certain that it must differ from any developer used in ordinary photography. The method of restraining an over-exposed negative is known, in order that it may be developed as a negative. If we consider this plate as an under-exposed positive, how shall it be pushed along over the zero condition, and developed as a positive? To that answer may be given in part. It must be developed in the light. A poor negative may be developed in a lighted room, and a poor positive may be developed in a dark room. These are not the conditions which yield the best results.

The writer had great expectations of the developer used by Waterhouse for producing positives in the dark room with ordinary exposures. The formula for this developer, as given in various works on photography, is:—

A	
Eikonogen	5 parts.
Sulphite of soda	10 „
Water	100 „
B	
Carbonate of soda	4 parts.
Water	100 „
C	
Phenyl-thiocarbamide	1 part.
Water	2000 parts.

For developing take of A1, of B2, of C1, and of a ten per cent., solution of potassium bromide 1. If the contrasts are too strong, a few drops of ammonia may be added.

This developer was said to produce a positive in the dark room with ordinary exposure. It was hoped that this urea salt either in the Waterhouse developer, or in some other, and with development in the light, might shorten the camera time very greatly.

When the exposure is normal for a negative, and the plate is developed in the dark room with this developer, it is found that a yellow to orange colouration appears in the shadows. If there are contrasts on the objects, the high lights look as they do in an ordinary negative. The roof of a building and the sides lighted by direct sunlight appear as in an ordinary negative. Light and dark strips of slate will appear reversed. The sky is dark. The sides in shadow are of a yellow or orange colour, sometimes almost red, and appear as positives. If the exposure is increased somewhat either by an increase in time, by stronger illumination of the object, or by using a larger stop opening, the colouration disappears, and the whole picture is seen to be a negative. A still greater exposure being made, the picture approaches, and finally becomes a zero result. Nothing develops on the plate. With a still longer exposure the picture is reversed, and a real positive develops. This picture can be developed in the light. This is not the case with the Waterhouse pictures; they look like positives, as any negative may be made to look like a positive, but they should be called pseudo-positives. They are not due to real reversal. They are, moreover, somewhat disappointing in appearance. It is only too evident that this Waterhouse process does not seem to be a very promising field for application to eclipse photography, although it presents some very interesting illustrations of different forms of silver.

The most promising field for investigation at present consists in the application of some transforming process to the film, after it comes from the camera, and before the picture is developed. Various oxidising agents have been tried with different degrees of success. The most satisfactory of these oxidising solutions is a mixture of nitric acid and potassium bichromate in rather dilute solution. There is no trouble in getting very satisfactory results with four minutes of exposure and a No. 8 stop. It seems very probable that by varying the proportions of this transforming solution, and perhaps varying the oxidising agents themselves, such exposures as are now given in the negative process may yield good positives. The field open for experimentation along these lines is very wide. The degree of illumination while in the transforming solution, and the time interval for the transforming process, are involved. The desirability of perfecting these processes at the earliest possible moment, leads the writer to urge those who have had wider experience in photography to lend a hand in this work. If fine details can be secured in a positive with a camera exposure such as is now required for a negative, then certainly there is great reason to hope that by exposing a plate during the whole time of totality in the long eclipses which will shortly take place, we may hope to secure better results than the present methods can give. In positive photography there can be no over-exposure. In negative photography, over-exposure is an approach to a zero condition. In positive photography the zero condition has been passed.

PROFESSOR FRANCIS E. NIPHER.

THE NON PHOTOGRAPHABLE.

IT would save much wasted effort and disappointment if a list could be drawn up of what cannot be shown in a photograph. It never will be, to suit a majority, more than a list of things that produce indigestion, "Quot homines tot sententiæ," and what one would debar another would admit. In this case it means, on the face of it, rather a useless matter to discuss the subject. But it is far from being so in reality. Opinions are not of a cast-iron kind, that once made admit of no change or alteration. A man may not alter a cherished belief suddenly from what he hears or reads, but something on the other side that he had not thought of, or had not thought of in another light, oftentimes makes an impression that will go far to modify and enlarge, if not in the long run to completely change, his original view. This is one reason why it is wise to ask advice. No one, or at least very few, follow it unless it go well with the trend of their own proposed line of action, but very useful hints of what to avoid, or to strengthen a weak point, are often gained, that help forward toward success.

So much in a general way is a reasonable justification for entering upon the enumeration of a few things that are really beyond photographic reach.

Spite of much honest, but misdirected, effort, attempting the work pure and simple of the artist shall take the lead. It is so far to the credit of a photographic worker that he feels so keenly the beauty and particular expression of an artist's representation as to wish to present his picture in the same manner. Apparent ease and simplicity are as misleading as the same qualities characterising the work of genius in all directions. Owing to this, and the keenness of his appreciation, the photographer is more apt to lose the broader proportion of things that should clearly prove to him the impossibility of his task. The true artist does not present real things upon his canvas, but things real, and otherwise, after they have passed through the mills of his thought, feeling, and imagination. These, in turn, are the result not only of an inherent inclination to tread in one particular direction at all cost, but of many years of training that have served to emphasise the features of the particular world he really lives in upon his soul. This is quite a different world to our work-a-day one, a fact made apparent enough when, as an eater of bread and cheese, he has to come into ours for it. His gods are as strange to us as ours are to him. Even were it possible for photographic methods of execution to equal the artistic, the particular mental training and absorbing predisposition of the artist are fatally lacking in the photographer. Small wonder that artists who feel all this should show such contempt for the rival efforts of disciples of the camera, plus the retouching desk and rough-grained printing paper. We

should confine ourselves within our own true bounds; there is plenty of room there, and artists will not hesitate to approve of truth, fidelity, and felicity of selection in photographic work, nor be backward in helping with valuable hints towards higher perfection. It is really a great pity that so many good men should not see things in this truer light, but persist in trying to convince themselves, and scornful larger intellectual and artistic circles, that smudges can be turned into pictures by suggestive titling. If so profoundly dissatisfied with the qualities of a photograph pure and simple that they cannot entertain it at all, a wiser plan would be to acquire a sufficiency of skill in the use of pen, crayon, or brush, to be able to reproduce the photograph with any objectionable features or excess of detail left out. This is copying, it is true, and not art, but certainly much nearer it than the other class of work, both in aim and execution.

Turning to less debatable photographic territory, many things are technically possible of execution, but yet not advisable, that is, in pictures. Rapid motion and arrested action, for instance. If the object be to prove the rapidity of a shutter, the large working aperture of a lens, or gaining a scientific record, an express train travelling at full speed, with every wheel spoke showing clear, the bather in mid-air in the progress of his dive, or the hunter surmounting the hedge, are most suitable subjects, but as pleasing pictures anything but to the point. They have all an air of unreality that grates upon the feelings, for, whilst no human eye ever saw these things as represented, human reason can prove clearly enough that they must be true or the principles of optics and laws of light false. Slow motion, on the other hand, is eminently photographable, the flow of a quiet river, a ship under sail on a calm sea, a boat being punted up stream, a carrier's van, a timber waggon, cows in the lane on the way to or from the milking point, and so on.

Crowds and processions are disappointing in photographs, as may be very readily judged from those of recent ones welcoming our returning soldiers from South Africa. An artist can manage to give character to the whole by emphasising a few members, and suggesting numbers with a minimum of detail; the camera gives not only every individual, but every individual button, within its range.

Beyond the working reach of most, but within their critical appreciation, or otherwise, are photographs of theatrical arrangements and posing to imitate Scriptural scenes. They are undoubtedly out of place. Granted even that the object of their presentation be higher than that of money gain, they cannot but jar upon the images, dim and vague possibly, but very sacred, present in the quietest corners of most minds. Even in the highest of such as these, the Ober-Ammergau Passion Play, and, in particular, the photographic representation of its chief features, there is a sense of something out of place in the attempt at materialising that which cannot be materialised.

War pictures in the highest sense, that is, pictures of the actual fighting, are also as yet impracticable, although in the future a panoramic picture taken by a tele-photo lens will probably alter this. That is, if recent experiences of the value of cover do not nullify the function of anything but a rifle. No lens can hope to pierce the rocks of a kopje or the earthwork in front of a trench. The suggestions conveyed by the Kodak pictures, recently exhibited, of scenes subsequent to, but that have figured in, war action, are the best war pictures ever yet exhibited.

The list of the non-photographable might be so indefinitely added to as to be discouraging. As this is decidedly not the object, but prevention of wasted effort leading to disappointment, as a co-relation to the foregoing it would be well to formulate as broadly as possible some conditions that make things photographable. Certain rules of composition in line and light and shade have been evolved from the long experience and practice of artists as the most pleasing to the eye, and the mind of which it is the window. Adherence to them means that there is nothing on edge, as it were, or toppling over. They give a sense of restful balance and agreeable proportion. There must, of course, be much more in a leading picture—action, suggestion, or indication of human feeling; but even these must be judiciously balanced and foiled to be fully effective, and by much the same rules. These rules are the ones almost universally quoted as applying to photographic pictures. But just think for a moment of the widely different conditions of their application! In the simplest case of all, for instance, that of a peaceful landscape, with a machine intent only upon indifferently registering everything with the same hard and high precision, how can imperious classical rules be followed out? Something may be done by judicious selection of a point of view, but let those who have tried it give their experiences and show their results! Occasionally, almost as occasionally as the possibility of including an angel on the wing in the picture, such a happy natural arrangement may be hit upon as fulfils all the laws of composition. But it is such a rara avis—the picture, not the angel—that he who could neglect the opportunity of recording it would deserve hanging. In plain English, the rules of the artist with his power of selection are altogether unsuitable for the photographer. They overload him mentally as much as a suit of armour would physically. The only logical inference, then, is, that there can be no such thing as a true photographic picture! Well, frankly, the writer believes there cannot in the highest artistic sense, except, possibly, by such an exception, an accident, as referred to above, and which will but go to prove the rule in forming the proverbial exception. There need be no derogation of photography assumed from this. In the first place, the perfect picture, by whatever means created, is much rarer than we would imagine, and when gained, however fine and beautiful as a whole, we cannot but unconsciously concentrate our liking more upon one particular feature in it than its artistic and technical excellence as a whole. It may be a face, figure, pose, a group of trees, an old manor house, a noble-looking hound, or horse, or stag, the suggestion of human emotion, distance, home, the seasons, or what not. That these are the strong points, apart from their setting, is proved by the interest aroused by the lighter sketches and studies made by the artist preparatory to painting the full picture. Are they, indeed, not so strong that, when privileged to see them, we often wonder why even a better picture could not have been made out of them! Here is fair ground for the photographer. He can show similar things to great advantage. But they must be treated in a similarly broad, simple manner to be correspondingly effective. The old manor house taken with the fullest practicable aperture at the best distance for the suppression of the most minute of the detail any way, and vignetting finally utilised to cut off everything that would weaken interest in the central object desired. A fine dog's head against a plain background makes a far finer picture than that of a terrier standing on a drawing-room chair, and a horse successfully snapped off in the paddock is well worth looking at. Many a church tower makes a delightfully pleasant little study that misses its aim if the whole church be attempted as a picture, and an angle of the pier can be made far more sea-sidy than a view of the whole pier, or pier and beach. In portraiture a head and face can be taken without the distracting frills and folds of the fashionable dress, and even the most frivolous photographer, one would imagine, would take the former to be the essentials.

All, then, are not pictures in the orthodox sense, but what matters it if they are what we like best? They are generally of simple, bold subjects in the foreground or near middle distance, with inevitable obtrusive objects vignetted off to the last possible point. The camera gives liberal ease, rapidity, and truth in the execution of its work, but the necessary tribute to its mere mechanics must also be borne in mind. If this be willingly paid, instead of being fought against in a vain effort after the barely possible or really impossible, much more satisfactory results will be gained, and without any disagreeable mental friction.

FOREIGN NEWS AND NOTES.

Stereoscopic Work with two Dissimilar Lenses.—In Liesegang's *Photographischer Almanach* for 1901, Herr von Bernkopf relates his experiment, which whilst not without interest is of doubtful practical value, to obtain a stereoscopic print from two negatives taken by two lenses of totally different construction and focus. Being called upon one evening to make a flashlight group, he used a 13 × 18 cm. camera with a 22 cm. focus lens working at *f* 16. At the same time one of the younger members of the Photographic Society set up a No. 2 folding pocket Kodak of 9 × 9 cm. size, and 11 cm. focus objective working at *f*-14. Both negatives turned out excellent, and when the results were shown regret was expressed that stereoscopic pictures had not been taken. Herr Bernkopf decided, therefore, to attempt the production of a stereoscopic negative, and used first of all a transparency 7 × 7 cm. from the Kodak film negative; this was carefully focussed in the ordinary stereo reduction camera and the outlines of the principal figures of the group painted on the outside of the ground glass, and an exposure was made. A transparency from the larger 13 × 18 cm. negative was then put in

position and focussed till the outlines of its figures coincided with the painted ones on the ground glass. Then the other half of the plate was exposed. The distance from two identical points in the two negatives was from 7 to 7½ cm. The negative was finally developed and the result was stated to be a beautiful stereoscopic effect with natural relief, which could not have been better obtained by specially built apparatus. With regard to this last sentence we would point out that true or natural stereoscopy could not be obtained, because it is absurd to suppose that the centres of the two lenses were the correct distance apart.

An Interesting Experiment.—Hans Spörl, whilst making some experiments with a stripping film, discovered that, if a sheet of paper was coated with gelatine and chrome alum and then exposed in the camera and developed with pyrogallol, a strong brown positive appeared in the chrome gelatine after the negative had been stripped. To decide the cause of this, a piece of paper merely coated with chrome gelatine was exposed in the camera and then developed, but no trace of an image could be obtained even with long development. It was then noted that, when the duration of the development with pyro was not unduly prolonged, a much fainter positive was obtained, and that it could be washed out. Herr Spörl concludes from this that the assumed tanning action of pyrogallol on gelatine containing a sensitive silver salt after exposure to light is confirmed.

The Thuringian Glass Industry.—The new year brings unpleasant prospects for the Thuringian glass-blowers. There is a strong movement in Austria for an increase in the duty upon glass apparatus. It is proposed, for instance, to double the duty upon Röntgen tubes, although the rate, according to the *Deutsche Photographen Zeitung*, now stands at seven shillings per tube. Fortunately such duties are unknown in this country at the present time. The articles affected by the contemplated change comprise thermometers, barometers, aerometers, syringes, and other surgical appliances. The manufacture of these goods is centered in Thuringia, and Schmidefeld, Stürtzerbach, Ilmenau, Frauenwald, Gehlberg, and other towns will be much affected by the change. Although these articles may appear to be of minor importance as manufactures, the total exports of them from Thuringia amount to about 50,000*l.*, America, England, Austria, and Russia being the largest purchasers. The increase in the duties is, of course, a matter of grave concern for the industry in question, and is resented by the German papers. But the opposition seems to be largely influenced by selfish considerations, and is forgetful of the fact that Germany uses her customs tariff for protective purposes. As an example we notice in a recent number of the *Deutsche Photographen Zeitung* that German paper-makers are agitating for an increase of the duties upon paper.

Luminous Microbes. — It will be remembered that small bottles containing cultures of luminous microbes were sold at the Paris Exhibition and attracted considerable attention. This *living light*, as M. Raphael Dubois called it, has been submitted to a few simple tests by M. Léon Vidal, the editor of the *Moniteur de la Photographie*. One of the small bottles, bought at the Exhibition, was placed upon a dry plate, half of which was covered with a piece of orange paper. After two or three hours' exposure the plate yielded a very distinct image upon the part which had not been protected by the paper. The next experiment was by interposition of a coloured screen between the bottle and the sensitive plate. The screen was formed of three strips of coloured glass—blue, green, and red. After two hours' exposure, the plate upon development only showed an image where it had been covered by the blue and green glass. Beneath the red glass the plate had not been affected. It would thus appear that the light emitted by the microbes is analogous to white light. In reply to the question, whether the living light may be of any practical photographic importance, M. Léon Vidal reserves his judgment. We know very little of it at present, and it is quite possible that it may be found of value where very slow action and facility of use may be important. It is worth noting that the cultures may be kept for some time, M. Dubois, their discoverer, having kept them for six months. M. Léon Vidal had not noticed any loss of efficiency in the sample in his possession, after keeping it a month.

The Ammonium Persulphate Reducer. — Complaints have occasionally been made concerning the unequal action of the reducer and its liability to cause stains in the films. In the *Chemiker Zeitung*, N. Schönchen attributes these faults mostly to insufficient washing of the plate after fixation. As ammonium persulphate is a hypo eliminator and only acts as a reducer in the presence of free sulphuric acid, the following procedure is recommended. The negative to be reduced should be well washed and then rocked for a few minutes in a dish containing a five per cent. solution of ammonium persulphate made alkaline by addition of a few drops of ammonia. The solution should then be acidified by adding diluted sulphuric acid (1 : 5) drop by drop, and, when the negative has been sufficiently reduced by the acid solution, it should be rinsed and transferred to a five per cent. solution of sulphite of soda to stop further action. The negative should be finally washed. The editor of the *Photographische Mittheilungen* remarks that he has given the process a fair trial, and has found it very reliable and even in its action.

ART PHOTOGRAPHY.

[A Paper read before the Brentford Photographic Society.]

I.

My first feeling in beginning to write on this subject is, that it must be to many, as it is to myself, a somewhat hackneyed one. Not a week passes but in one or other of the photographic journals art photography is treated in a more or less serious manner. While, therefore, it seems impossible to say much that is absolutely new on the subject, I feel that it is only by making my best endeavour after some degree of originality in its treatment, by dealing with certain points in somewhat greater detail than is usual, and at the risk of being dull, to try to weigh dispassionately certain debatable points (always decided in opposite ways by special pleaders) with the view of arriving at some solid ground of conviction—it is only if I succeed in some measure in dealing usefully with these matters that my treatment of this well-worn theme can be at all justified.

Before any profitable discussion of the subject, or progress in its elucidation, can be made, it will be well to have, if possible, a clearly-defined idea of what art really is, but this is not such an easy matter as might at first be imagined. Let us see what guidance we can get from books, and, to begin, let us take the dictionary.

Art. Practical skill guided by rules. That is about all that can be got from this source. Now for the definition of one or two great writers.

"In all true works of art (if thou know a Work of Art from a Daub of Artifice) wilt thou discern Eternity looking through Time—the Godlike rendered visible." This is Carlyle—a tremendously high standard for the poor photographer, it must be confessed.

"Art is the spirit's voluntary use and combination of things to serve its end." This is Emerson—a very broad and comprehensive definition, doubtless, but whether practically helpful to us is another matter.

"How shall we hand down to future ages the spirit and form of all the joy and beauty we see filling the universe? Art alone can perpetuate the living realities of the world, the things of heaven and of Buddha, the life of men and women, ay, even of birds and beasts, and herbs and trees." This is a quotation from the Japanese artist, Hokusai, and is also more transcendental than practical.

Every work of art either states a true thing or adorns a serviceable one. Of all facts concerning art this is the most necessary to be known, that, while manufacture is the work of the hands only, art is the work of the whole spirit of man, and as the spirit is so is the deed of it. Great art is the expression of the mind of a great man, and mean art is that of the want of mind of a weak man. I say that art is greatest which conveys to the mind of the spectator by any means whatsoever the greatest number of the greatest ideas, and I call an idea great in proportion as it is received by a higher faculty of the mind, and as it more fully occupies, and in occupying exercises the faculty by which it is received. Needless to say, these are the words of John Ruskin, and in them I think we have the true touchstone of value in art. Although we may often differ in our application of this test of true art, it is difficult to see how there can be a better one expressed in words.

It is now time that we should address ourselves to the practical inquiry how we are to make photography take the art quality, and the following are among the various ways that suggest themselves:—

1. Selection of the best and most suitable subjects.
2. Selection of the best aspect or point of view of the subject.
3. Selection of the best conditions of light and atmosphere.
4. Artificial modification of the subject.
5. Use of technical means to modify the normal working of photographic processes, and the selection of the particular process that is deemed most suitable.

Believing that rule is best illustrated by example, and precept supported by practice, I shall, as far as possible, exhibit slides illustrating the various points, or, in the case of opinions advanced, slides which may in a greater or less degree serve to justify these opinions. I shall also sometimes put on the same slide several illustrations of some particular quality so that comparison may be more easy.

I shall deal in succession with the points just mentioned. The first, and I think by far the most important, is the selection of the best and most suitable subjects. When one begins the practice of photography the mere charm of the operation is sufficient, but as novelty wears off we find it desirable to take more and more pains to produce pictures that will justify the trouble of producing them, and that will, if possible, be something of a treasure to us. We are not long in discovering that all subjects are not alike suitable. We are obliged to pass by many subjects that charm us, on account of practical difficulties in their representation. Perhaps the most painful limitation of all arises from our inability to render colour. Even when we have used the appropriate means to secure, as far as possible, what are called colour values, we have not the most remote suggestion of the charm that many subjects possess from their colour alone. But there are other imitations beside this.

In many subjects the range of light and shade is too extended for representation on paper, but in some cases we can, by certain modifications in the exposure and development of our plates, restrict that range in such a way that the eye does not feel there is anything unnatural. Indeed, a picture is often more pleasing on account of a restricted range of tone, but, as a rule, we wish to have in our negatives almost the whole "gamut" from transparency to opacity. Here it may be mentioned incidentally that those pictures have the greatest light of range and shade that are printed on pure white paper in black colour. We cannot, for instance, have pictures in brown, or red, or blue, without restricting our scale, and this restriction is, of course, increased by printing on a tinted surface.

If we take no special care in developing plates where the subject is landscape, this extreme range of light is seen in the pure white that represents the sky, even in cases where there were rather prominent clouds. The slide now thrown on the screen will serve to show that it is quite possible to secure the proper illumination of both sky and ground if care is taken to retard or hasten development on different parts of the plate as required.

There are other cases, however, in which it is much more difficult, if not altogether impossible, to restrict the scale. There will now be shown two pictures taken on a small stream, at the same spot, and at the same time, the one looking up stream, the other down. In the first picture the lighting is good and the quality called breadth is satisfactory. In the second picture a ray of sunshine has penetrated into the scene, producing a speckled appearance, and the picture is in consequence far less satisfactory. The difficulty just pointed out is most frequently felt in confined and badly-lighted situations, especially where there are leaves, wet stones, or other reflecting surfaces, and it becomes almost impossible to secure that "breadth" of effect without which a picture is valueless.

Another limitation arises from the inability of the photograph to represent distance satisfactorily. The eye seems to magnify what it looks at. It does not do so in reality, but the effect is just the same. Unfortunately, the eye does not magnify the distance in a photograph, whatever the reasons may be. A distant range of mountains may be magnificent as seen in nature, and may yet look altogether insignificant when photographed. Here is a view from Stirling Castle, where the first range of the Grampians shows in clear weather as a majestic wall in the azure distance, but it is of little account in the photograph. Fortunately, this diminished appearance can be observed on the focussing screen, and, when it is practicable, we should approach the objects we wish to make impressive till they occupy that space on the picture that we consider essential. Of course, long-focus lenses come to our aid here in some cases, but I am not sure that the tele-photo lens is much of an art weapon.

The range of subjects adapted to photographic representation is so vast that it is impossible to enumerate its detail. Yet I think we shall be wise if we employ photography most largely in certain distinctive fields—those that the artist is baffled in, or tires of, or is confused with, and there are many such. Every one is attracted to some particular kind of subjects that awaken his interest or admiration in the highest degree, although, I believe, photographers carry more variety into their work, and are more catholic in their taste, than artists. In choosing subjects the difficulty will be to find the best and most characteristic types, because these are few, and require to be most carefully sought out. Take a tree, an elm, for instance. We can see many commonplace specimens of the tree, and a few that are singularly beautiful, but we have to search long and far till we find the one specimen that exhibits in highest measure all the grace and dignity of the tree. As it is with trees, so is it with every other thing that we wish to secure, we must search diligently till we find it. I dare say this attitude of mind becomes a habit with most of us in the end, and we are continually, and often unconsciously, on the outlook for the best examples of every natural object.

It is sometimes recommended to amateurs to choose one particular kind of subject in order that they may the more easily master its inherent difficulties, and such advice is probably, as a rule, sound. In any case it is best to be guided by one's own predilections. Some take delight in photographing the objects that illustrate the branch of natural history or of science, which is their special study. Some confine themselves to portraiture almost exclusively. Others restrict their efforts to the purely pictorial and artistic representation of land or seascape, and this seems to be the direction in which emulation is keenest. My own work has been chiefly in this direction, and, while I admire every kind of scenery, to me the hills and skies are nature's masterpieces. She bestows her utilitarian work on the level plains, as well as much that is also very beautiful, but all her triumphant efforts are set where our eyes can best behold them. As an artist sets his picture on edge, for us to look at it, so nature tilts her finest pictures for our delight. Her richest colours and most enchanting forms—all her revelations of majesty and mystery are found among the mountains, and, as if fearful that we in our carelessness and blindness should miss her choicest gifts, she repeats them all in her mirroring lakes. The purple and crimson of heather, the green and gold of grass and bracken, so rich among our feet, are, aloft and afar, blended and etherealised into such an iridescence of transcendent beauty that we lose ourselves in admiration. Alas! photography cannot as yet render these colours, but the grandeur of mountain form and towering cloud are not denied to us. But it is not alone the vast and the distant that charm us among the hills, pictures the most attractive are around us everywhere. Here is a group of pines, broken, but still defiant, telling, as trees can tell, of the fury of mountain blasts. There is a tremendous boulder, split by the wedges of the frost, and adorned with fern in every crevice. But, chiefest of all, most attractive of all, is the mountain brook. Its cascades are crowded with beauty. Are there wild flowers, the princesses of their kind, they gem the slopes around. Are there ferns, the most opulent of graceful frond, they spring from every bank. Are there boulders encrusted with rarest enamel of moss and lichen, everywhere they grace the channel, while the wild rose stands by adorned like a bride. Silver sand, and polished pebble, the plash and play of sparkling, pellucid waters—everything that can charm the eye is here to be found. Miles away on the hillside, you can tell where the brook runs, and where it falls in spray, for the birch trees have left all the slopes to crowd around it on its course from the rocky notch seen on the sky-line, down to where it joins the sweeping river that gives the glen its name.

The second division of our subject is the selection of the best aspect or point of view. This is a matter that demands most careful study. It is only men of experience who feel the necessity of taking infinite pains in choosing the point of view. A change in the position of the camera, higher or lower, back or forward, to one side or the other, may have a vital effect on the composition of the picture, even when the change is apparently trifling. In some cases it may be a matter even of a few inches that makes or mars the harmony of lines, or the linking together of light to light, and shadow to shadow. Here is a slide showing an ash tree growing in a somewhat exposed situation. It will readily be observed that from no other point of the compass would the curvature of the branches due to the stresses of the prevailing winds be so well expressed. The next slide shows the same effect on a row of birch trees, and I think the way in which these birch branches and sprays show the result of the external and internal forces that have acted on them is interesting and beautiful. Nothing can exceed the variety in the angles and curvatures.

Yet our photographs must not look as if taken at an artfully-selected point, from which alone a common, uninteresting place may be made to appear picturesque. We must, if possible, feel that it

portrays a place essentially beautiful, a place lovely from all points of view. The sculptor knows that his work must look well from all points, and the artist, in the same way, should, if he can, give the impression that the place represented would be delightful to walk about in, and be pervaded by beauty. The slide now shown is an attempt to produce a picture with this desirable quality. A beauty not seen but felt is attempted to be added to the beauty that is seen, a pervading harmony is added to that which exists on the surface alone. We must think of the ground plan of the picture, and then of sections of it, and feel that it is all right within and without.

Perhaps I should have spoken first of the necessity of exercising extreme care in selecting the point of view when dealing with figure subjects, where the most trifling changes are the reverse of trifling in the result.

We now come to the consideration of the effect of light and atmosphere. In the first place, it may be said with great confidence that there is scarcely any condition of light that may not be made available for good work. The brightest sunshine may be the best for one particular subject, while another may be best treated in dull or foggy weather. Even moonlight may be pressed into our service, its difference from sunlight as regards defining power is so amazingly small that the uninitiated would scarcely believe that a picture, apparently taken at noonday, was actually taken at midnight. As an illustration (perhaps more curious than anything else) of the way in which the most widely different conditions of lighting can be made to give the same result, there is now shown a slide made from a negative taken by moonlight, the moon being for the most part obscured by light clouds during the exposure of three hours. In the best summer light an equivalent result would probably have been got in, say, one-fiftieth of a second. This goes to show that the moonlight has only about a five-hundred-thousandth part of the actinic strength of the best daylight. It is, therefore, merely a question of length of exposure, sensitiveness of plate, and so on, to get a sunlight effect when the moon is shining, or, conversely, a moonlight effect by very short exposure when the sun is shining. I have heard an artist express as his opinion the absurdity of the latter proceeding, but, if he had shown that moonlight differs but little from immensely diminished sunlight, and that by gathering up moonlight for hours, or by cutting off sunlight at the hundredth of a second, we get identical results, he would likely have admitted there was nothing very absurd in it, although his belief as to the possibility of getting a good representation of the effect of moonlight or any other light by any photographic process whatever would in all probability have remained the same.

We are now long past the period when it was considered that the best photograph was the clearest one, and when it was regarded much as a diagram, and praised for the clearness and amount of detail it showed. Although we find now and again a tendency at present to go to the other extreme, there can be no doubt it is wise, as a rule, if not to eliminate unimportant detail (which can hardly be managed), at least to subdue it. Under the old creed photographs were usually taken at right angles to the source of light, so that all things might be strongly relieved by their cast shadows. Now, in many cases, a broad and soft effect is preferred, and this is best attained by working nearly against the light. The slides now shown will illustrate the effect of these two different modes of working. Although the first view, taken nearly in the direction of the light, is more distinct and vigorous, the scond view, taken at the same time and place, but against the light, will be felt by most people to be the more pleasing, and therefore artistically the best. It should, however, be pointed out that the prints from negatives from which the slides are produced illustrate my meaning far better than the slides do. It seems to be a peculiarity of lantern plates, no doubt in the main a desirable one, to make every picture vigorous rather than soft.

The next scene, an old bridge over a stream in a wood, shows the effect that may be got when there is a certain amount of haze, giving what the painters call "atmosphere," and subduing harshness when the amount of fine detail might prove oppressive. In the succeeding slide the effect of a broadly-diffused light over the whole surface of the picture is, I think, very beautiful. (This slide is by Mr. George Cleland, Edinburgh.) The next slide, by the same gentleman, is also admirable in lighting as well as in other qualities—"Waiting."

It is under this heading that the consideration of cloud effect most naturally comes in. It is admitted by all that a large expanse of sky represented merely by white paper makes the best picture ineffectual, while a good sky will redeem what is otherwise an indifferent picture. That being so, it is important to know how the practical difficulties of introducing cloud may be overcome. Doubtless the best way is to work at such time as the natural cloud effect is suitable to the subject, and of a kind that can be satisfactorily photographed, but it appears to be quite practicable, and, if skilfully done, unobjectionable, to print clouds from a separate negative. As has already been shown, it is quite possible, by controlling development on different parts of the plate, to give due importance to cloud without darkening the landscape. This control can also be extended to printing processes when required, and in the books by Mr. Horsley Hinton, and perhaps others, there are ample practical instructions for the control and modification of prints, as well as instructions for printing in skies from separate negatives.

It is, of course, necessary to make the sky harmonise with the rest of the picture and be appropriate as well. This slide, showing a pine tree, the survivor of a hurricane, has a stormy sky, in which fragments of torn cloud are drifting wildly to the zenith, and I think it is very appropriate to the subject.

Another, "After sunset on the Tay at Aberfeldy," has the natural sky of the negative, and this seems to be almost essential where there is water, which must, of course, truly reflect the sky above it.

I think it is in the late afternoon, or even after sunset, that most of the best cloud effects are got. Perhaps it is unnecessary to say that equally good results may be got at the corresponding hours in the morning by those who are abroad at that time.

In any case fine cloud effects when they occur must be secured with the utmost promptitude. This slide, from a sketch, shows how completely a sky may change in its character in the short time required to set up the camera at a new standpoint.

We should have places sought out that we can visit under particular conditions. We should go to the right place at the right time.

We now come to the artificial modification of the subject, which may include grouping, when that is possible.

In photographing landscape it is sometimes desirable to break away small branches, twigs, or tall weeds, when these interfere with the view. This can usually be done with safety. Whether it would be possible to carry out the converse operation successfully and transplant a few weeds, or, say, a small bush, or a bit of fencing, to break up bareness or formality in a foreground, or to balance an awkward line, I am not prepared to speak with any confidence. The camera has a keen eye, and would glory in showing up a faked scene to our confusion. It did once when I tried something of this kind. Still, with great care, I think there is a possibility in working within certain rather narrow limits. In the slide now shown it is quite evident that it would have been a clear gain to have lopped off the intrusive branch on the right. In this case the branch overhung a river, and was so difficult of access that I had to forbear touching it.

JAMES CRAIG.

EXPOSURE METERS.

AT the first meeting of the Camera Club for the new year, on January 3, Mr. James Cadett opened the 1901 session of the Club with a paper upon the subject of "Exposure Meters." He explained that his own practice with the camera was so small that he found it absolutely necessary to employ something which would afford him an indication of the exposure required under the conditions prevailing at any given time. His friend and neighbour, Mr. Payne Jennings, ridiculed the idea that exposure meters were of any utility, but, although his power of judging exposure was almost marvellous, he sometimes made mistakes, which he remedied by means of modifications of the developer. This brought Mr. Cadett to a brief consideration of the researches of Messrs. Hurter and Driffield as to the action of bromides in the developer. They found that it was possible by development to make differences in a plate of 11 to 1, but they said, and the lecturer fully endorsed the statement, that the less one meddled with the developer the better. A correctly-made developer should contain no soluble bromide, and, consequently, no caustic alkali, and the exclusion of bromide from the developer was one of the most important matters that had to be considered with reference to the future treatment of plates. It was a curious fact that a slow plate generally developed faster than a rapid one. For instance, a negative on an ordinary plate, developed with metol and sodium carbonate, without bromide, would reach average density in about 1½ minutes, while one of the more rapid plates would require four or five minutes. This was probably due to the fact that the very fine grain of a slow plate was more easily getatable, so to speak, by the developer, and that therefore less time was

required for development. Having pointed out the great desirability of giving correct exposures, Mr. Cadett proceeded to describe the various meters and actinometers which have been from time to time introduced. The first of these was the late Mr. Warnerke's sensitometer, brought out some 20 years ago, the ratios of the various tints of the instrument being calculated for the inventor by Mr. Cadett. For several years the lecturer looked upon this as an entirely satisfactory means of testing the speed of plates, but he subsequently discovered that the last five numbers read were valueless. To define the speed of a plate by the last tint shown by the Warnerke sensitometer was impossible, for the simple reason that the last tint shown must come in the curve of under-exposure, and Messrs. Hurter and Driffield had laid it down as a law that a correct negative must possess opacities proportional to the light intensities that produced them. Some of the present makers of exposure meters were basing their numbers on the same principle as the Warnerke sensitometer; they were working on the under-exposure curve of the plate, and, although their instruments worked fairly well in practice, the exposure indicated by them was generally excessive. He had been in correspondence with Mr. Watkins and Mr. Wynne upon the subject, and thought that an improvement would shortly be effected in this respect. The Hurter and Driffield Actinograph was a charming scientific instrument, and exceedingly useful in the hands of any one possessing a fair knowledge of arithmetic. For outdoor work it was perfect, and, if the indications for parts of a second had been expressed in simple fraction, instead of in decimals, it would be far more extensively used. With the actinograph one had to exercise judgment as to the atmospheric conditions at the time of exposure, the five divisions being "Very bright," "Bright," "Mean," "Dull," and "Very dull." The users of exposure meters containing an actinometer contended that an element of uncertainty was introduced in the determination of the particular weather conditions, and that this uncertainty was obviated when the light was actually measured by the time required to tint the sensitised paper of the actinometer. According to Mr. Cadett's experience, however, there was no more difficulty in deciding the weather aspect than in judging the precise moment when the exact tint was reached on the actinometer, and far greater errors were made with regard to the classification of the subject. Generally speaking, if the nearest important object was at a distance equal to fifty times the equivalent focus of the lens, the subject might be regarded as open or average landscape. In the estimation of exposures for the photography of interiors, both the Watkins and the Wynne meters possessed advantages over the actinograph, considerable convenience arising from the possibility of arranging a suitable diaphragm to enable the plate of the actinometer to be simultaneously exposed and for the same time. The Watkins meter was deservedly a great favourite, the counting pendulum being especially conducive to accurate working. He preferred to work without the blue glass, because, after the correct tint was reached, a further exposure made very little apparent difference in the appearance of the paper. The Wynne meter was also a very general favourite, and was very simple to use, its simplicity being due to the extremely clever and astute idea of expressing the sensitiveness of the plate by the size of diaphragm through which the plate would require the actinometer time for its correct exposure upon a normal subject.

In the course of a short discussion which followed the reading of the paper,

Mr. Chapman Jones said he always took an exposure meter out with him. He had never used it except to get a general idea of the character of the light, but he had a table of exposures which had been corrected from time to time, and which had proved of great service. Mr. Cadett had expressed the opinion that it was a mistake to take into account the colour of the subject, as recommended by Mr. Watkins, but Mr. Chapman Jones could not agree with this remark, and thought that an old oak subject or a red-brick building must require more exposure than a clean white-stone building. He thought, too, that a much greater distance than 50 times the focal length of the lens should be taken for the nearest object in an average open landscape.

Mr. Sanger Shepherd pointed out that there was a far better chance of getting a perfect negative on a slow plate than on a rapid plate. With the former an error of five, or even ten times, the correct exposure would still yield a good negative, but, with very rapid plates, the margin of error allowable was very small indeed. Many people did not appreciate the fact that the colour sensitiveness of the paper used in actinometers was different to that of the plate. It was sometimes stated, for instance, that the exposure for an isochromatic plate could be determined by placing the screen over the tint in the actinometer, but this course must result in failure.

Mr. Mitchell alluded to the very objectionable method adopted by one of the meter manufacturers for packing the sensitive paper, the package being sealed with a sort of fly-paper composition, which was a great nuisance and a detriment to the use of the particular instrument referred to.

Mr. Chapman Jones remarked that the last five numbers of the Warnerke sensitometer, although not of much use for half-tone work, were of service for many scientific purposes.

Rev. F. C. Lambert advocated the use of exposure meters, and did not consider it possible for an inexperienced person to expose with even approximate accuracy by merely looking at the image upon the ground glass.

Coming Events.

On Monday next, January 14, Mr. H. M. Lomas will read a paper on "Stag Hunting with the Camera;" and on Thursday, January 17, Mr. Ignatz Herbst will deal with "Photogravure and its Progress in England."

EXHIBITION OF THE WORKS OF MR. F. M. SUTCLIFFE.

The Sixth House Exhibition of the Royal Photographic Society, held at the Society's house, 66, Russell-square, W.C., is devoted to the works of Mr. F. M. Sutcliffe, and was opened on the evening of the 2nd inst. with an address by that gentleman. The Exhibition is free, and will remain open until February 16.

It is, doubtless, the ambition of many photographers to have an exhibition all to themselves, to be free to exhibit as many or as few works as they please, and to be independent of that brutal insensibility to merit which, we are sometimes given to understand, characterises all selection committees. Such an exhibition gives a man the fullest opportunity to display his power, but, at the same time, it puts him to the temptation to show his weakness. Mr. Sutcliffe has had the opportunity and the temptation. He has fallen into temptation. Mr. Sutcliffe has written much and charmingly anent pictorial photography, and we have naturally imagined that the standard he sets others would be the standard he sets himself in his own work. This Exhibition disillusionises us; the merciful rigour of a selection committee was sadly needed for Mr. Sutcliffe's own sake.

There was a pessimistic view running through the opening address, a hopelessness of the capabilities of photography, a deprecatory estimate of his own ability, as though Mr. Sutcliffe felt that the fatal facility of the Kodak in his own hands was leading him downwards, as, indeed, it appears to be. It also contained a half-ironical, half-serious homily on "frames," with just enough truth in it to make it a dangerous lesson to the unthinking. The whole constituted a piece of destructive criticism of photography, fortunately not earnest enough to be convincing, and certainly not written in the best of taste.

We have already indicated that, of the 185 pictures that form the collection, a proportion might well have been spared with advantage, not only to the Exhibition in relieving the crowded walls, but to Mr. Sutcliffe's reputation. Let us now turn to the brighter side. The greater portion of the work has been done in the neighbourhood of Whitby, as Mr. Sutcliffe tells us, with a quite unnecessary apology for a hardness in the character of the scenery. There is no dearth of subjects in his neighbourhood which lend themselves to picturesque treatment, and, as many of the pictures show, Mr. Sutcliffe is often able to appreciate the possibilities of his material and to render his impressions in a way which appeals to us, despite the limitations of photography he complains of. Whitby, as Mr. Sutcliffe represents it, is a place where there is a perpetual mist to soften harsh outlines and to envelop the distance in mystery. He makes the most of this natural attribute of the place, and his pictures are full of the atmosphere that others who work in, in that respect, less favourable climes vainly endeavour to simulate by artifice. Some of his atmospheric effects are charming, and one never has to hesitate in deciding whether or not the effect is truthful to nature.

In his groups Mr. Sutcliffe is sometimes very happy, his fisherfolk and others are always naturally posed, or, if not, he skilfully hides all signs of artifice. The groups are not always pleasing as pictures, and in many cases are of little other interest than as studies of character; still in this respect they are all worthy of some attention. Among the groups are many old favourites. "Stern Realities" has lost nothing of its freshness. "Water Rats," however, has undergone a metamorphosis. It appears here enlarged from its original size and printed in dusky red. The original print, which was hung in the Society's Exhibition many years ago, and for which the medal was awarded, is in the possession of the Society. A faded albumen print though it is, there is still a charm about it, which makes the present print appear but a crude imitation of its former self.

Mr. Sutcliffe seems to have trammeled his work with fetters of his own forging. He tells us in his opening address he has chosen the gloomier months in the year for his efforts. Naturally, there is a befitting thread of sadness through them, the sadness of weeping nature. But nature is not always weeping, and in the maritime town there are other people than sailors and fisherfolk. In "The Fisherman's Daughter," "Cinderella," and in a few others, Mr. Sut-

cliffe shows that he possesses something of the creative power and that he is not entirely dependent upon the selective faculty, which, indeed, sometimes fails him. It is to be regretted that he has not devoted more attention to work of this character. It is true that imaginative work is more conducive to fame than to the acquirement of the prosaic necessaries of life, and, to a professional photographer, whose pursuit of photography has a more serious aim than to be a mere pastime, this is a consideration; but we have always looked upon Mr. Sutcliffe as a shining example of a somewhat rare class among photographers—those who do not allow necessity to rule the conscience. These honourable few form a striking contrast to many self-styled amateurs and others who, while loudly proclaiming their unselfish devotion to art, are inwardly actuated by little but a sordid greed of gain.

News and Notes.

The Birmingham Photographic Society's Sixth Annual Conversazione will be held in the Grosvenor Rooms, Grand Hotel, Birmingham, on Tuesday, January 29, 1901.

Royal Photographic Society.—The Exhibition of Photographs by Mr. F. M. Sutcliffe, of Whitby, now hanging at the Society's rooms, at 66, Russell-square, may be seen, on presentation of visiting card, daily from 10 to 4, Wednesdays 10 to 8. All those who are interested are invited to call and see the Exhibition.

Messrs. Raphael Tuck and Sons, Ltd., of Raphael House, Moorfields, E.C., have been kind enough to send us a specimen packet of their souvenir postcards in honour of Lord Roberts' return from South Africa, together with a few packets of the latest additions to their Pictorial Postcard series. Messrs. Tuck remark: "Our Postcard Collectors' Prize Competition, the inauguration of which we announced some few weeks back, is now fairly started, and we beg to enclose an advance proof of the rules governing this competition, and which will be issued this month to the public through the usual trade sources. This competition, which will be in progress during the entire opening year of the new century, is already exciting great interest in many home circles throughout the country."

With the Christmas number of the "Poster" Mr. Hugh MacLeay announces that hereafter Mr. Charles Hiatt will succeed him as editor, and that he will devote himself entirely to the editorship of "Modern Advertising," a magazine "which will deal comprehensively with all matters relating to advertising." But the "Poster" is to be modified in certain ways, as its new title, the "Poster and Art Collector," explains. It will "continue to be the leading organ of artistic advertisement," but space will be found for other subjects so it may appeal to "all those who collect objects of art and bric-à-brac," and become "a general magazine written by experts for collectors." The truth is that, though a Poster Academy has just been formed, says "The Daily Chronicle," the Poster "boom" has seen its best days, and is on the decline. There is an attempt this Christmas to revive the artistic poster on London hoardings, but with not too striking results. The public finds art quite enough of a problem in the galleries, without having to confront it in the street.

Telegraphic Communication with the Planets.—It has long been an idea with some astronomers that the planet Mars is inhabited. Two or three weeks back, Mr. Douglas, in Arizona, observed certain phenomena in Mars during seventy minutes which, it was stated, he said, he looked upon as an attempt by the inhabitants of that planet to communicate with this world. However, last week, M. C. Flammarion, of Paris, declares that Mr. Douglas's message was amplified, and more made of it than the observer intended, but adds that he sees nothing rash in the project of communicating with the planet. Supposing that Mars is inhabited, there is no reason why communications between its people and ours should not be carried on, say, after the method of heliographic signalling, as is done by the Army in the field at certain periods, and it is also possible that the signals might be recorded by photography. But, and it is a big but that will occur to the lay mind, how is the code to be established? It would be easy enough if one of the people of Mars would visit us, or one of us visit Mars, but until that is possible it is difficult for the layman to conceive how any communication, if made, would be understandable.

Testimonial to Mr. W. T. Wilkinson.—"The Goldsmiths' Institute Journal" states that the first session of the photography classes was brought to a close on Friday, December 28, and Mr. W. T. Wilkinson took the opportunity of delivering a lecture before the combined classes on "Orthochromatic Photography," illustrating it with the spectrum and lantern slides, made by himself and by some of the students. At the close of the lecture, Mr. Gill, on behalf of the students, presented Mr. Wilkinson with a handsome fountain pen inscribed: "From the Photo Students, Goldsmiths' Institute, December 1900." In the course of his remarks, Mr. Gill further intimated that a sum of money was still in the possession of Mr. G. Waite-Wilson, which would be expended in the purchase of such photographic apparatus as Mr. Wilkinson should choose for himself. The students, said Mr. Gill, were desirous of showing their appreciation of the abilities of Mr. Wilkinson, and of his readiness at all times to aid them in the study of photography. Mr. Wilkinson, in thanking the students for their kindness in presenting him with so handsome and useful a present, said it appeared to him as a very eloquent testimony that the photographic section of the Goldsmiths' Institute was appreciated. The regularity of the students at the classes was most gratifying to him as a teacher, and he appreciated fully the very careful and eager attention which they always paid. He would always, concluded Mr. Wilkinson, endeavour to conduct the classes, so that the testimony shown that night by his students might be deserved.

Commercial & Legal Intelligence.

Last week Mr. T. G. Ames (Messrs. Edwards and Co.) gave a successful demonstration on the making of lantern slides on the Kristal plates before the Hull Society, which gave great satisfaction to the large audience.

Notice of Removal.—Messrs. Gold, Smith, and Co., notify that they have removed their offices and stock rooms to more commodious premises at 4, Victoria-bridge, Manchester. The firm state that the premises are as central as the old ones, and, in addition, they will be enabled to carry a larger stock of all classes of mounts, especially plate sunks and fancy mounts.

Messrs. Elliott and Son, of Barnet, inform us that, for family reasons, the business of Elliott and Son was incorporated under the Limited Liability Acts on December 20, 1900, and will in future be carried on under the style of Elliott and Sons, Limited. The management and staff continue as heretofore. All the shares have been retained by the proprietors.

In "The Photographers' Record" for January, Messrs. Elliott and Son, of Barnet, announce that a new factory for the manufacture of Barnet bromide paper and Barnet dry plates is being built, which will have twice the capacity of the existing works, whilst the building devoted to the manufacture of Barnet carbon tissue is being greatly extended, and new coating machinery is being laid down.

We learn from "The Journal of the Society of Arts" that the directors of Kodak, Ltd., have announced to their employés that they will grant additional pay to the extent of five shillings a week to any member of their number who may obtain a certificate for Proficiency in Commercial Knowledge from the Society of Arts, or a Certificate in the Commercial Knowledge Examinations of the London Chamber of Commerce, and a further five shillings for technical knowledge shown by the acquisition of a certificate in the examination for Photography of the City and Guilds of London Institute.

Kodak v. Nodark.—It has been decided in the High Court of Justice, Vienna, before the Vice-President, that the word "Nodark" applied to photographic cameras is an infringement of the trade mark of the Kodak Company. The Viennese firm selling the apparatus called "Nodark," having declined to cease the use of the name, action was brought, and the defendant was found guilty of having knowingly traded in photographic apparatus which bore a trade mark imitating the trade mark of Kodak, Limited, in a manner likely to mislead retail purchasers. The defendant was condenmed to pay a penalty of k.500 and costs, and to destroy all circulars, documents, and other articles bearing the imitation trade mark. The defendant alleged that he was only acting as agent for an American firm in selling the "Nodark" cameras, but the Court held that every business man must be well acquainted with the law bearing on such subjects.—Kodak v. Cosaque. A similar judgment has been given in the Civil Court, Paris, against a company in France using the name "Cosaque" for photographic apparatus. The Court held that the defendant company were guilty of fraudulently imitating the trade mark of the Kodak Company, the imitation being such as to cause confusion in the minds of the public. The defendant was condemned to pay at once to the Kodak Company the sum of 500f on account of damages to be settled by experts appointed by the Court, and was forbidden to sell the photographic apparatus called "Cosaque," or the "New Cosaque," or to print or publish any circular or prospectus mentioning the marks in question in any way whatever.

Patent News.

The following applications for Patents were made between December 24 and December 31, 1900:—

Camera.—No. 23,673. "An Improved Photographic Camera, also Applicable for Use as a Case for Field and like Glasses." P. Hartwig.

Copying.—No. 23,836. "Improvements in Means for Copying Photographic Pictures." W. Sauer.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
14...	Camera Club	*Stag Hunting with the Camera.* H. M. Lomas.
14	Glasgow and West of Scotland	Exhibition of Prize Slides.
15	Aintree	Annual Social and Prize Distribution.
15...	Birmingham Photo. Society	Social Evening.
15	Gospel Oak	*Rapid Instantaneous Photography.* W. Kilbey.
15	Scarborough	*Holiday Wanderings.* Rev. W. T. Reeder, M.A.
16	Aberdeen	Demonstration: *Thornton Film.* W. D. Welford.
16	Borough Polytechnic	Lantern Night.
16	Croydon Camera Club	*A Practical Lesson in Enlargement.* Kodak, Limited.
16	Redhill and District	Annual General Meeting.
16	Woodford	*The Hand Camera in Practice.* W. L F. Wastell.
17	Camera Club	*Photogravure, and its Progress in England.* Ignace Herbst.
17	Darwen	Smoking Concert.
17	Hull	*With Gamekeeper and Camera* W. Alton.
17	Liverpool Amateur	Annual Meeting
17	London and Provincial	Lantern Night.
17	Oldham	*The Homeland of Shakespeare.* J. H. Crabtree.
18	Bognor	Monthly Competition.
13	Croydon Microscopical	Demonstration: *Thornton Film.* W. D. Welford.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 3,—Mr. W. T. Wilkinson in the chair.

The Chairman showed a bromide paper print toned with Ferguson's copper process. The whites were liable, however, to degradation, but he found that this defect was avoidable by the addition to the bath of more ferricyanide.

Mr. R. P. Drage read from one of the French photographic papers that it was generally useless with this copper toning bath to attempt to clear the print, the image itself being invariably attacked.

Mr. A. Mackie handed round some of the prints toned by Mr. Hodd a few weeks ago, after his demonstration of the development of P.O.P. One of them had been referred to as over-toned, but Mr. Mackie found this was not the case, and that the other prints, although supposed to be toned, had not apparently been acted upon at all. These latter prints, however, had Mr. Hodd's approval.

Mr. T. E. Freshwater showed some photo-micrographs of shells, of native gold, and of the eggs of the parasite of the goose × 100.

Mr. Mackie referred to the demonstration at the Royal Photographic Society of the new method of lighting introduced by the Atmospheric Gas Co. of Leeds. The superior power of the light was wonderful, and the system, he thought, must be a valuable one. A mixture of paraffin oil and benzoline is contained in a suitable receptacle, and air is forced through this at a low pressure by an electro motor, a water motor, or convenient source of power. The gas given off, mixed with the air, is consumed in conjunction with an incandescent mantle, giving a light of really remarkable intensity and brilliance. The actinic powers of the light are still more marked; portraits can be taken in a short space of time, and P.O.P. prints can be made in some twenty minutes. Incidentally, it was mentioned that the mantle improved with age as regards lighting power and durability. It could be handled with impunity after a short use.

Mr. Haddon thought that the perishing of mantles so soon was due more than to anything else to the filth in the air, which settles and adheres to the mantle, clogging it, and preventing proper incandescence. The Bunsen burner drew up the air and the filth with it, so that the suggested placing of a cover over the chimney when not in use would not do much to lengthen the life of the mantle. If the air were filtered, however, before it reached the mantle, it would be longer preserved.

Mr. Mackie mentioned a form of acetylene light which was convenient where it was desired to turn off the light at times. A considerable amount of time was required for the generation of the gas from the carbide, which was prepared in a special way. A means of regulating the supply of acetylene gas was badly wanted, and the lack of this means was much against the more universal use of it.

Mr. Beckett remarked that the lower the temperature at which gas was generated the better the light it gave; consequently the slower it generated the better.

Mr. Freshwater mentioned the system of automatic production of acetylene by means of cartridges of calcium carbide which enter the water according to the rate of consumption of gas.

PHOTOGRAPHIC CLUB.

JANUARY 2,—Mr. E. W. Foxlee in the chair.

General business and the election of two new members having been disposed of, a conversational discussion upon points of photographic interest characterising the past year took place. The remarks, interesting though they were, covered too great a variety of topics to be intelligibly committed to a short report. Matters of general and scientific interest were also discussed at some length.

Croydon Camera Club—The meeting on the 3rd inst. was mainly devoted to the Kammatograph, a portable form of cinematograph, specially adapted for amateur photographers. Mr. Alphonse Courlander explained the mechanism and working of this unique apparatus to a goodly assemblage of his fellow members, and, assisted by Mr. Kamm, projected several moving photographs on to the screen, which fully bore out the claims advanced on behalf of the apparatus. Briefly put, these are that brilliant and steady pictures are possible, and that the apparatus is better adapted to amateur needs than are small cinematographs worked with celluloid film. The Kammatograph pictures are taken and printed on circular glass plates, which, by means of ingenious but effective mechanism, take a series of 600 pictures on a spiral, and yet project them in perfect sequence in rectangular fashion. The negative is developed at one operation, just as an ordinary plate. The positive is made as an ordinary lantern slide. The pictures shown by the instrument were very favourably regarded, one, a railway station, being encored. The price of the machine is but £6. The President passed round an ingenious porcelain weight helpful for developing celluloid film, also a number of Christmas cards, which were either entirely photographic or based on photography, which had been sent to him by acquaintances. Some were greatly admired.

FORTHCOMING EXHIBITIONS.

1901.

January 14–19 ..... Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

February 16–March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.

,, 20–27 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath, S.E.

March 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE BIRMINGHAM EXHIBITION.

To the EDITORS.

GENTLEMEN,—We shall hold our Annual Exhibition from February 23 to March 2 inclusive.

The judges have not yet accepted appointment, but I hope to have their names ready for an early issue.

We should esteem it a favour if you would make this known through THE BRITISH JOURNAL OF PHOTOGRAPHY.—I am, yours, &c.,

H. VOOGHT-CORNISH.

A WAGES QUESTION.

To the EDITORS.

GENTLEMEN,—I should like, with you, to congratulate "Comyn" on holding such a highly-remunerative appointment in photography. I consider myself a skilled operator in reducing, enlarging, photo-litho transfer, &c., having had 20 years' experience, and I should be very grateful to "Comyn" if he would put me in the way of obtaining a similar appointment to his own at even the low wage of three guineas, and for which I should be most happy to pay a handsome premium.—I am, yours, &c.,

ALL-ROUND HAND.

To the EDITORS.

GENTLEMEN,—May I ask your correspondent, "Comyn," if he could oblige me with a hint as to the direction in which I might seek an appointment at half the salary (six guineas) which he receives?

I have had a good experience in outdoor work, chiefly groups and architecture, also interiors, copying and enlarging, black and white drawings and pictures, preparing lantern slides for engineering lectures, &c., in every case exposing, developing, retouching, printing, and finishing all work myself. I have also made thousands of large sun prints, cyano, ferro, and gallic, generally preparing the original tracings myself. Have also a small knowledge of process work, can make screen negative, print on metal, and etch same.—I am, yours, &c.,

LONDON.

January 8, 1901.

To the EDITORS.

GENTLEMEN,—The letter of your correspondent, "Comyn," must ıuse some amazement amongst employers, who will ask themılves, "How is it possible, under present-day competition, to pay ı operator £6 6s. per week of five days, working from ten to five?" ; is certainly a riddle to explain how, when the general rate of ages is £3 3s., certain employers find it profitable to pay double ıat amount. It can only be answered in two ways, either such nployers are content with small profits, or that their commercial ıpacity is above the average. This latter is, I think, the true ılution. Such employers admit the fact that the rate of wages, *er se*, has no influence on profits. Wages are simply a charge on ost of production, and have not that close control over profits it usual to assume. This fact I have stated in the columns of THE RITISH JOURNAL OF PHOTOGRAPHY, and the present instance is a ery apt confirmation. The leading manufacturing firms, noted for ıe quality and excellence of their work, are found to pay wages ıuch above the average rate, and profit by so doing. A case is ıus clearly made out, namely, that, if high wages have these effects ı individual examples, why should not similar effects follow their eneral application? I think that like results would follow a general ise in wages, and that, consequently, manufacture would become ıore profitable to employers quite independent of the rate of wages.)bviously, "Comyn" is not overpaid, since no "large firm in the ity" is run as a benevolent institution for the benefit of employés.—
am, yours, &c.,
JOHN A. RANDALL.

THE TRADE POISONS BILL.

To the EDITORS.

GENTLEMEN,—I noticed in your issue of December 14 that a misake was made regarding the result of the meeting on the Trade 'oisons Bill at the London Chamber of Commerce. The resolution roposing to support the Bill was *not* carried. I know, of course, hat the statement to the opposite effect in your issue was published y you in the belief that it was correct. You were probably misled y an account in one of the daily papers.—I am, yours, &c.,
THE EDITOR OF "THE BRITISH AND COLONIAL DRUGGIST."

[We thank our confrère for his courteous note, but the report to vhich reference is made owed its origin, not to a daily paper, but o a purely official source. It was sent us, in fact, by the Hon. ecretary of the Trades in Poisons and Poisonous Compounds for echnical and Trade Purposes Protection Society. EDS.]

THE WEATHER AND PHOTOGRAPHY."

To the EDITORS.

GENTLEMEN,—The weather in this country is "a fickle jade." Last veek, while the temperature here was between 45° and 50°, the thernometer in Berlin fell to zero, and in Vienna it was not much higher. Until a few days ago we have had no actually cold weather this vinter, but then there was a quite sudden change, and the thernometer registered something like 20° below what it did a day or wo before. This sudden change, I find, has brought trouble to some nexperienced photographers who have not taken it into account in heir dark-room manipulations. One of my friends writes: "Somehing seems to have gone wrong with my lantern plates, for, although give double the exposure to gaslight I used to do with the same egatives, I cannot get the image out with full detail." Another finds hat some plates that were exposed two months ago have all turned ut under-exposed and would yield no density, though what were leveloped before Christmas turned out all right, and all were exposed nder similar conditions. In each of these cases the trouble must be ttributed directly to the lowness of the temperature not being suffiiently taken into account in the work.

Many dark rooms, even amongst professional photographers, are ot heated, and there is no provision for their being heated. In uch cases a paraffin stove, if used, will quickly bring the temperaure of a small room up to 55° or 60°. But not so with the contents f the bottles on the shelves or the water supply; they will require much longer time to acquire the temperature of the room, and for his reason they should not be kept in it at nights, but put into a varmer place. A shelf in the kitchen is an excellent place for the mateur to keep his chemicals during the winter months, as there hey will always be retained at a pretty equable temperature. Some bject to a paraffin stove in the dark room on account of the smell, ut there need not be much of that if the wick be kept properly rimmed and the outside of the stove be kept clean and free from il. Although, if these points be neglected, unpleasant fumes will e given off, though, however unpleasant they may be, they will ave no injurious effect on the work, whatever photographic operaions may be carried on in the apartment.—I am, yours, &c.,
January 7, 1901
WEATHERWISE.

THE HISTORY OF GELATINO-CHLORIDE, P.O.P.

To the EDITORS.

GENTLEMEN,—It is a proof of the great influence possessed by THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC that my remarks therein re the way that photographic history is written have already borne fruit.

Mr. E. J. Wall says, in your issue of last week, that "no one man can write the history of photography," and I would add that no one man ever invented anything entirely, and also point out that it is not the man who suggests, but the man who works out, perfects, and shows examples of a process that is the real inventor; and, as regards the commercial introduction of this paper, E. Valenta, in the "Photographische Correspondenz" for September, 1897, says, "Gelatino-chloride paper for printing out was first prepared by Obernetter, of Munich, in 1886, and later by Stolze, of Berlin, and Liesegang, of Düsseldorf."

I am, personally, quite indifferent in the matter, having no end to serve and no commercial interest in photography, and, if my remarks are the cause of greater care being taken by future photographic historians, they will not have been written in vain.—I am, yours, &c.,
J. BARKER.

January 5, 1901.

REVERSAL IN ECLIPSE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In the months of October and November, 1899, you published some correspondence from Lieutenant-General Tennant, R.E., on the subject of a photograph by Mr. Bremner of the eclipse of the sun, as seen by the latter at Quetta in January, 1898. In the picture the sun was represented by an opaque crescent, where the portion obliterated by the moon was luminous. General Tennant took exception to this, saying that it was impossible that the source of all light should become "black" on the positive. You subsequently published a letter from me, in which I stated that I had seen the negative and could say that it had not been "faked" in any way.

I now enclose a picture of the recent partial eclipse of the sun taken at Simonstown, and reproduced in the "Cape Times" Weekly Edition of December 12, 1900. In this you will observe precisely the same effect—the "source of all light" is black.

Perhaps some of your readers can explain why. My view is that at the time of being photographed the sun had assumed an orange colour, to which the plate used was insensitive, hence clear glass in the negative and black in the print.—I am, yours, &c.,
J. F. FORBES,
Captain, Wiltshire Regiment.

[We are much obliged to Captain Forbes for the illustration, which clearly shows the reversed effect described, and we have forwarded it to General Tennant in case he may wish to offer any remarks on the subject. EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. Hendrey, Godmanchester, Huntingdon.—*Three photographs of patent railway-truck couplings.*

FLASHLIGHT.—We have seen excellent results produced by the lens named. It should certainly serve your purpose for the kinds of work you mention.

MAKER OF LENS.—J. LAWS.—In reply: The firm of Bourquin and Co., whose name the lens bears, has been extinct for many years. They were not the actual makers of it, but only the sellers.

A. ANDERSON (Burton-on-Trent).—The apparatus shown in the sketch will, no doubt, answer the purpose very well. But where is the necessity of any apparatus at all for making the emulsion in small quantities?

ELECTRIC LIGHT IN STUDIO.—G. COSWAY.—Twelve 16 c.p. incandescent electric lamps, arranged in a circle as your propose, would be of no practical use whatever for taking portraits at night in the studio. The exposure necessary would be far too long for practical purposes.

LANTERN SLIDES AND COPYRIGHT.—"ART." The copies of the pictures in the foreign galleries you name are, in all probability, copyrighted by those who made them, and it would be illegal for you to reproduce them in any form whatever. "Being merely lantern slides" makes no difference at all. The reproductions are pirated all the same.

PHOTOGRAPHIC BENEVOLENT FUND.—"Q." writes: "Will you please tell me the address of the Secretary of the fund for the relief of distressed photographers, as I am in sore straits?"—In reply: There is no such fund now. The Association is extinct. It died from want of support from those it was established to help in time of need.

ORTHOCHROMATICS.—"F. C." writes: "Would you kindly advise as to the books most likely to be of help in obtaining an insight into the principles of isochromatic work?"—In reply: The subject is dealt with in the last edition of Sir William Abney's "Instruction in Photography," published by Messrs. Sampson Low and Co., St. Dunstan's House, Fetter-lane, E.C.

THIN NEGATIVES.—B. CLUER and "S. J."—In reply: The fault with the negatives is not that they are under-exposed, but that they are under-developed. The tardy appearance of the image, which has been mistaken for under-exposure, was due to the cold temperature. Had the developer been warmer, or longer time in it allowed, the negatives would have been fairly good.

WATERPROOF GLUE.—"G. A. W." asks for a recipe for waterproof glue for wooden dishes.—In reply: Marine glue answers the purpose well. It is composed mainly of indiarubber, mineral naphtha, and shellac. It is troublesome, not to say dangerous, to make on a small scale. We should recommend you to purchase it ready-made. It may be had from most operative chemists.

BOOK ON CINEMATOGRAPHY.—E. L. BARNES writes: "Could you tell me of any firm in existence that has brought out a book describing how to use the cinematograph, and everything connected with it, including motor and electric appliances?"—In reply: The best book on the subject is "Living Pictures," by Mr. H. V. Hopwood, published at the offices of "The Optician," 123-5, Fleet-street, E.C.

HEATING DARK ROOM.—H. WILSON asks: "Can you tell me a cheap and convenient means of keeping my dark room at a comfortable working temperature? It is very small and very cold. I may as well tell you that it was at one time the servants' w.c., so you will know what sort of place it is?"—In reply: One of the small paraffin-oil stoves, with a four or five-inch wick, will keep the place very warm, and the heat may be easily regulated.

DESIGNS FOR PHOTOGRAPHIC CHRISTMAS CARDS.—"J. G. J." The designs sent are excellent and decidedly novel, and we should say would, probably, be popular—to an extent. As to how to dispose of them, we should advise you to submit them to some of the publishing houses that make a feature of cards of the more artistic kind. We should also advise you to lose no time in doing so, as they have long been at work on next season's issues.

ART BOARDS.—A. D. BERRY writes: "In THE BRITISH JOURNAL ALMANAC, 1901, p. 767, there is an article on Mounting of Prints, in which it mentions 'art boards.' I should be glad if you could inform me where I could procure them, and probable price, as they are not to be got in this city (Leeds)?"—In reply: The author probably refers to the series of mounts for photographs issued by Messrs. Percy Lund, Humphries, and Co., of Bradford. Better write this firm.

ELECTRICAL RETOUCHERS.—"J. T." writes: "I am a professional retoucher, and am exceedingly anxious to know if a mechanical or electrical retouching pencil I have heard of is of any use? I have inquired in vain at various photographic dealers' in Glasgow."—In reply: Two such instruments were introduced to the English photographic public a few years ago, but we believe they are not now obtainable. We do not know of any retoucher who uses either one or the other.

RESIDUES.—"WASTE" says: "I sent my year's collection of residues to ——— to be reduced. They weighed a little over seven pounds, and all I got for them was £3 12s. 7d. Can this be a fair return?"—In reply: We cannot say; but, as the firm they were sent to is a highly respectable one, we should say it was. The value of residues is not governed by their weight or bulk, but by the silver they actually contain, and with the ashes and washings from some of the P.O.P.'s that is very little compared with their weight.

STUDIO BUILDING.—"STUDIO" writes: "I am going to erect a new studio, and should feel very much obliged if you would give me your valuable advice on the following: The site will give an east and west light only. Can such a light be used as successfully as a north? If so, should I have it glazed with ground glass to keep out the sunshine, or what would you recommend for that purpose? Would the enclosed sketch be good sizes, or can you suggest any improvement? What angle should the roof have for an east exposure?"—In reply: Yes. If both sides are glazed, either can be used at will, the west in the morning and the east in the afternoon. Then the sun will not be a source of trouble. We would suggest that five feet, instead of four, be made opaque at the south end. The proportions cannot well be improved upon. The angle for roof as shown in the sketch will be very suitable.

HOLIDAYS.—"W. O. M." says: "Will you please tell me what is the custom in the photographic line with regard to payment for holidays? I am an apprentice, and for the first year am receiving 6s. a week. Last week the governor stopped me 2s. because we did not open on Christmas Day and Boxing Day. Is that right?"—In reply: No, certainly not; you can, legally, demand your wages for the full week. Your employer must be a very mean man to stop 2s., and it is certainly no credit to the profession that he did. We should like to know who he is.

ENLARGING A SINGLE FIGURE OUT OF A GROUP.—"GROUP" asks: "Will you kindly inform me the best way to make a cabinet vignette of child out of a school group, without spoiling the group photo I have to copy?"—In reply: Presumably the face of the child is small, and an enlarged copy is required. In which case copy the face the size required, and if any of the other figures are in the way, and they cannot be vignetted out, better stop them out in the negative, so that the background prints white.

BLISTERS IN CARBON PRINTING.—"C. W. W." says: "We are, now and then, much troubled with blisters (very small) in our carbon prints, single transfer. I have noticed sometimes the water as drawn from the main comes out like whitewash through the air in it, but it quickly disappears after standing a while. Do you think this may have anything to do with the blisters?"—In reply: Yes, we do, and we have little doubt it is the cause of the trouble. Fill the tray used for the water for mounting the prints some few hours before it is required for use. The air will then have time to escape.

A PATENT MATTER.—"BEN" writes: "I notice that a firm of photographers, doing stamp photos by artificial light, state that the process is protected by patent. Will this apply to that firm's particular method or process, or is any process of producing stamp photos protected? Is there anything to prevent me, as a professional photographer, fitting up a camera of my own for the purpose and carrying on the business?"—In reply: If the firm in question have a process which is protected by patent, you cannot use that one. But, of course, you can make stamp portraits by any other method you may desire. Stamp portraits are not protected by any patent.

STAINED PRINTS.—C. CRIBB says: "Can you account for the stains on the enclosed prints, otherwise than their not being sufficiently fixed? My printer tells me they were in the hypo for the usual time, but I expect that, as the solution was very cold, he did not keep them turning about all the while."—In reply: The stains are, unquestionably, due to imperfect fixation, and, as some show by the shape of the stains that one print was allowed to stick to another, it is clear that they were not kept in motion while in the fixing bath. As you mention that the solution was very cold, a considerably longer time should have been allowed for its action. Warm the hypo solution up to 60° F. this cold weather.

VARIOUS QUERIES.—"ADULLAMITE" writes: "1. With the average lens, is it the rule that, supposing with the largest stop the exposure required is four seconds, will it be eight seconds with the next stop, sixteen with next, and so on? If this is so, it would be useful, when taking interiors, &c., as the exposure can be judged with full aperture; but when the stop is in perhaps hardly any outline can be seen on the focussing screen. 2. Is the purpose of the 'swing back' to keep the plate upright? 3. If so, is it generally effective for keeping the lines square? 4. Can you name me a simplified law book that will inform me on the formalities, &c., on purchasing a business, &c?"—In reply: 1. Yes, if the stops are arranged according to the Royal Photographic Society's standard. 2. Yes. 3. Certainly, if rightly used. 4. We know of no law books specially devoted to the subject. The 'Cabinet Lawyer,' published by Longman and Co., and 'Every Man's Own Lawyer,' published by Lockwood and Co., are useful works.

SPOTS ON PRINTS.—"TROOPER" writes: "I enclose prints. Can you, please, say why the same refused to tone, also the cause of the spots? I used the toning bath quite cold, as I have done before scores of times, yet never with same result. In the bath the prints almost faded away, turning to light-orange colour, and am at a loss to say whether the P.O.P. or the gold is at fault. I dissolved the gold in boiled cold water,, and, as it seems a good colour, and just as usual, I cannot see that it is at fault. About an hour previous to toning I had developed some platino prints, but in separate dishes, and had washed my hands thoroughly before toning, so I don't see any cause from that source. Would you advise me to have my toning baths at 'blood heat,' ascertained by feeling with the finger tips?"—In reply: So far as one can judge from the appearance of the prints, we should say they were washed in water, prior to toning, that contained some deleterious matter. We should surmise, by the look, a trace of hyposulphite of soda. It might, however, be something on the hands from previous work.

*** Our report of Tuesday evening's meeting of the Royal Photographic Society, editorial table, several answers to correspondents, and other matter, are unavoidably held over until next week.

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EX CATHEDRÂ.

Photography and Criminals. When any one indulges in the covetous habit it is apt to become as much his master as opium with the opium habit, and this breaking of the leash usually ends with a breach of the eighth commandment. Our Judges, being aware of this, try to cure the habit by increasing the punishment upon second and succeeding convictions. One difficulty in the way is the question of identification, for it goes without saying that one who makes free with other people's property is apt to convey names also, so that the mere name would be useless for the purpose. He cannot, however, appropriate a face, hence for a long time past it has been customary to make photographs of criminals before they leave prison. Sometimes this has been done by a prison official, sometimes by a local photographer who contracts at so much per head for doing the work. In course of time an immense series of albums of criminals' portraits has been accumulated. In the early days of this method it was a simple matter to run through the collection when it was required to know if a convicted criminal had been sentenced before, but now the collection is so large the labour and time involved is enormous. It is estimated that the average time occupied by an official expert at the work to search all these photographs is eight hours. Clearly this is almost prohibitive, and the probabilities are that photography will, to a great extent, be abandoned in favour of some other system. There is little need to regret this, for, from what we hear, the payments made to professional photographers have been utterly insignificant, and, further than that, dry plates have so facilitated the work that the prison warders have been gradually ousting the professional. The Bertillon system, which seems likely to supersede mainly, if not wholly, the use of the camera, consists in the registration of certain close anthropometrical measurements, about a dozen in number, such as length and breadth of head, face, and ears, length of feet, ditto fingers, and so on. These can be so classified, divided, and subdivided, that ten minutes only are required to search the register and discover whether the criminal is upon it or not. Hence "exit photography" seems the probable result.

* * *

Eclipse Photography. The last solar eclipse offered great attraction to the photo-astronomical enthusiast, and great was the disappointment of many that they were unable to leave the country and join one or other of the many trips organised for observation purposes. Professor R. W. Wood, however, has recently devised a method of producing an artificial eclipse, which so resembles the real article that any one can now enjoy the sight of an eclipse while seated in his armchair at home. He can see it, and also can photograph it. En passant, it may be said that a very fair artificial visual eclipse can be seen any evening from the inside of a four-wheeler if a disc of brown paper be stuck on to the window so as just to hide the nearest electric lamp. If the glass be an old one all the better. This effect, however, does not show the streamers, so conspicuous a phenomenon in solar eclipses, which Professor Woods' does. All the apparatus needed is a six-candle incandescent lamp, a rectangular water tank (an old aquarium is just the thing), a short glass tube, and half-a-dozen strips of tinfoil. The tank should be filled with clear water, and about a teaspoonful of solution of mastic, in alcohol, added. The lamp wires should pass through the tube, and the latter attached to its end by enough sealing-

wax to make the whole water-tight. Five or six strips of tinfoil, from half to one mm. wide, should be fastened with shellac cement round the lamp in groups opposite to each other, leaving clear spaces of equal width to the strips, and larger spaces, of course, between each group. Finally, a circular disc of metal, a trifle larger than the lamp, is affixed to the top of the lamp, so as to cut off the light and represent the dark body of the moon. When the light is turned on and the whole arrangement dipped in the water (rendered opalescent by the precipitated mastic) and viewed from the front, a most beautiful corona is seen, which the use of a Nicol prism shows to be radially polarised, as is the coronal light. To make the effect a visually perfect reproduction of an eclipse effect a little malachite green dye is added. There is then seen, if a proper amount of dye is used, "a most beautiful and perfect reproduction of the wonderful atmosphere round the sun, a corona of pure golden white light, with pearly lustre and exquisite texture, and misty streamers stretching out till lost in the bluish-green background of the sky." Professor Woods' description appears in a letter to last week's "Nature," and is accompanied by a photograph which recalls most strongly the published photographs of total solar eclipses.

* * *

Wood Preservation. With regard to the use of wood which has undergone special treatment to render it waterproof, &c., one of the latest patents is for the following process, briefly described: The wood is first dried at 212° F., and then subjected to a pressure of 100lb. to 200lb. and a temperature of 250° to 500°. Then, at a temperature of 150° to 300° and a pressure of 100lb. to 400lb., it is impregnated with a mixture of creosote, resin, and formaldehyde ("formalin"). The pressure is then relieved, and the wood allowed to soak for the liquid, thus rendered viscous, to be retained in the pores. Finally, the wood is hardened by treating it, under pressure, with resinate of lime, resinate of lime and turpentine, or hot milk of lime. We think it a matter of the utmost probability that, sooner or later, camera-builders will adopt wood treated by this one or other of recently published methods of hardening and waterproofing. There would seem to be, if the right process be chosen, everything to gain and nothing to lose.

* * *

The Oxford Convention. The meeting of the Oxford Camera Club, which was held on Monday evening last under the chairmanship of Sir William Herschel, the President-elect of the Convention for 1901-1902, was attended by the present President and Mr. F. A. Bridge, the Honorary Secretary and Treasurer. After the reading of the paper which is printed in another part of this week's JOURNAL, Mr. Bridge gave a brief history of the Convention, together with an indication of its aims and objects. This was followed by the exhibition of about 120 lantern slides made from negatives taken at previous meetings of the Convention, and contributed by the following skilful workers in this delightful branch of photography:—Mr. Harold Baker, Mr. Godfrey Bingley, Mr. F. A. Bridge, Mr. F. P. Cembrano, Mr. R. W. Dugdale, Mr. Edgar G. Lee, Mr. W. Parry, and Mrs. Catharine Weed Ward. It was evident that this exhibition, which, in photographic and pictorial qualities, was strikingly good, gave great pleasure to the meeting. The latter was held in the lecture theatre of the great Museum, which owes its existence to the efforts of the late Sir Henry Acland, whose lamented death occurred quite recently. The Oxford Camera Club is fortunate in having the opportunity of holding its meetings in a building of such a scientific and elevating character. We were interested to learn that the Club numbers over a hundred members, many of them connected with the University, and several being ladies who take keen interest in photography of a kind not exclusively devoted to aimless, if harmless, hand-camera work. It should be said that Sir William Herschel, this year's President of the Convention, is also President of the Oxford Camera Club.

* * *

Prospects for next July. Although six months have to elapse before the Oxford Convention, the sixteenth of the series, will be held, it is not too soon to refer to the local kindly interest in the meeting. This year the Convention will be privileged to have a President who not only bears a name that is illustrious in the annals of photography, but who himself closely follows each fresh development of colour photography, a subject which in all probability he will treat in his inaugural address. Of some of the other members of the local Executive who are thus early devoting time and attention on behalf of the Convention, we may name Miss Acland, Colonel Impey, Mr. Claude Rippon (the Editor of "The Oxford Times"), the Rev. W. W. Merry, Mr. Alderman Salter, Mr. R. A. R. Bennett, and Mr. G. W. Norton (the Local Hon. Secretary). The latter gentleman has a firm and business-like grip of the arrangements, which in the main respects may be looked upon as already complete. In all probability, the reception and the Presidential address will be given in the Town Hall of the municipal buildings, one of the handsomest and most refined civic palaces in the country. The ordinary meetings, the trade exhibition, and the lantern displays will be held in the Assembly Room of the Municipal Buildings, and the dinner at one of the larger hotels for which Oxford is famous all the world over. The excursions may include Warwick, Banbury, a river trip, and minor expeditions; and we believe it is the intention of Sir William Herschel to invite members to a garden party at his residence, Littlemore. The week's programme, which will include, we believe, some lectures upon subjects rather more novel and attractive than the hackneyed topics of every-day photographic discussion, is practically complete. An ideal meeting of the Convention may be looked forward to next July. Classic Oxford, with all its wealth of architectural and natural beauties and its rich historical memories, could not possibly be excelled for the inducements it holds out to the summer photographer, and it has the great advantage of being easily accessible from London, the Midlands, and the North. We specially suggest to those American readers of the JOURNAL who may have arranged to visit England next summer that they should set aside the week, July 8-13, for participation in the Convention. The Honorary Secretaries' names and addresses are: Mr. F. A. Bridge, East Lodge, Dalston-lane, London, N.E., and Mr. G. W. Norton, 13, Park-terrace, Oxford, and both gentlemen will be pleased to receive applications for membership. The subscription is five shillings per annum. Thanks to the kind co-operation of the lady and gentleman named, and Mr. Bridge, the prospects of a successful Photographic Convention at

Oxford in July next are of the very brightest, and we are sure that hundreds of our readers will join us in looking forward with feelings of keen anticipation to a splendid week's photographic work, and upon which, in years to come, we may look back with rare pleasure and satisfaction.

* * *

Exhibition of modern illustration.

To the Loan Exhibition of Modern Illustration, at the Victoria and Albert Museum, South Kensington, which was opened to the public on Monday last, admission is free, and, as it does not close for a period of two months, those of our readers who are interested in the subject should make a note to visit this unique collection of illustrative work. The Exhibition has been organized by the Board of Education, of whose Committee of Advice Sir William de W. Abney, K.C.B., acted as Chairman, with the assistance, amongst many artists and others, of Sir Henry Trueman Wood, M.A. The catalogue contains an introductory article by Mr. H. B. Wheatley, F.S.A., briefly reviewing the history of book illustration, and tracing with some minuteness the metamorphosis of the hand-engraved wood block of the early sixties—the golden age of book illustration—into the phototypic production of the present day. In all there are over 1600 exhibits, foreign as well as English, and the work of the most eminent illustrators, from the days of Leech and Doyle down to the present time, is shown. To photographers generally the Exhibition, of course, makes no direct appeal, but those whose concern lies with the reproduction of drawings for illustration will find abundance of material here to interest them, for in numerous cases originals and reproductions are placed side by side. Some of the Spanish work in colour has been reproduced in trichromatics, and the originals and copies are also mounted in juxtaposition. In regard to these it cannot be said that the colour block process has preserved the artist's touch or has satisfactorily reproduced the subtle hues in the paintings. This is an admission not made without reluctance, for, of course, theoretical writers have long insisted that trichromatic photography furnished perfect facsimiles of artist's originals. The thanks of the public are due to the Board of Education for organizing this most instructive Exhibition of 40 years' illustration, and, as it certainly is of distinct, if minor, photographic interest, we trust that many of our readers will take the hint we are giving them to visit it. That it is well worth inspection must be obvious from the indication which we have given for its scope.

DISTORTION IN LANTERN SLIDES AND ITS CURE.

When one sees a lantern show at the present time, one cannot but be reminded of the general superiority of the slides as compared with those produced a decade or so ago. Not that the commercial slides are so much better, but because those now made by amateurs are infinitely superior to the dense black-and-white things that used to be considered good enough to show at the time to which we refer. This superiority, in a great measure, is due to the excellence of the plates now supplied, specially for transparency work. Till these were on the market the amateur had, perforce, to be content with the ordinary plates that were intended for negatives.

At times, however, one does see slides shown that, though in all respects photographically perfect, are marred by the distortion of perpendiculars. This is most unpleasant to the eye when seen upon the screen, particularly if the lines happen to come in close proximity to the edges of the mask, and that is rectangular. This distortion of convergence, it is needless to say, is caused through the camera not being placed level when the negatives were taken. This might easily have been avoided if the camera had been used on a stand, but not so easily if it were held in the hand, notwithstanding that it might be provided with spirit or other levels. Again, it is often impossible to obtain the whole of a high building in a picture unless the camera is pointed upwards, and comparatively few hand cameras are furnished with a swing back, or rising front, which would enable the distortion caused by the tilting to be avoided. Even if the hand camera were provided with a swing back it is doubtful if the novice would always employ it with sufficient judgment to obviate the convergence of the lines, for the image, as seen on the finders, does not always coincide with what is included in the negative.

If the camera were provided with a rising front, with sufficient rise to avoid the trouble, we are met with the difficulty that the majority of hand cameras are supplied with lenses that are only capable of fairly covering the plate when they are fixed at its axis, and, if they are raised much beyond that, the lower corners of the negative suffer. The case would be different if all cameras were provided with lenses of the anastigmatic type, which have a great covering power, and even illumination over a wide field. Although the lines may be out of the perpendicular in the negatives, there is no reason why they should be in lantern slides made from them, for the evil may be corrected, though all may not be aware of the fact, although it has before been dealt with in The British Journal of Photography. Therefore, for the benefit of some of our younger readers, we refer to it again, now that the lantern season is at its full.

Supposing we have a negative of a building in which the lines converge toward the top, owing to the camera being pointed upward when it was taken in order to include the whole of the subject in the picture. Now, what we have to do to render the perpendiculars parallel is to enlarge the upper portion of the image and reduce the lower portion, then we shall get the picture as it should be. This, of course, can only be done when the slides are made by camera printing. If we put the negative in the dark slide of a camera with a swing back, and adjust it so that the top of the negative is nearer the lens than the bottom, and the image is received on the ground glass of a second camera placed in front of it, the perpendiculars will be seen corrected, provided, of course, that a suitable slope be given to the negative in the swing back, and that is easily adjusted. But it will be obvious that, as one portion of the negative is nearer the lens than the other, all parts will not be in sharp focus with its full aperture, therefore it must be considerably stopped down in order to get all portions sharp. The best method of obtaining that in practice is to first sharply focus the centre of the picture with a medium stop, and then put in the smallest one with which the lens is provided.

If the negative requires a very great slope to correct the

distortion, it may be found impossible, even with the smallest stop, to get all parts sharply defined. In that case it will be advisable to make the correction indirectly, making a transparency in which the convergence is but partly cured and then from that adopting the same means, making a new negative, which may then, if desired, be used for contact printing. If this procedure is found necessary, the transparency should be more fully exposed and made denser in the development than if it were to be used direct as a lantern slide.

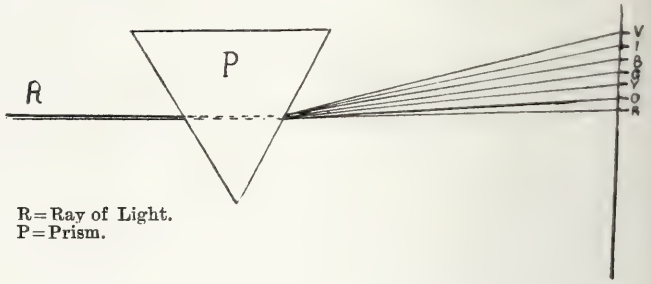
As some may not have a second camera, or one with a swing back, then an ordinary copying camera, such as is used for lantern-slide making, may be utilised by fixing the negative in the camera in a sloping position. This may easily be done with the aid of a wedge-shape strip of wood or a couple of wedge-shape pieces of cork, adjusted so that, while one end of the negative is in the rabbet of the holder, the other is kept the required distance away by the wooden wedge or the corks, as the case may be. This extemporised arrangement is readily secured in position with a few drawing pins.

When the slope necessary for the negative is very great, it will be a good plan to place a piece of ground glass an inch or two from it, at the back, so as to ensure its even illumination, which, in some circumstances, might not otherwise be attained.

ON A METHOD OF PRODUCING PHOTOGRAPHS IN COLOUR, SUITABLE TO THE REQUIREMENTS OF THE AMATEUR.

I WONDER how many amateur photographers, and for the matter of that, professionals also, have wished that the photograph they have taken might appear when finished the same as it did when on their focussing screens. Alas, though! the finished production, no matter how technically or artistically perfect, is never the same, it is, indeed, robbed of nearly all its glory by being reduced from a beautiful coloured picture to a sombre monochrome. In some cases this is, indeed, far more to be regretted than in others, for example, in the case of a glorious red sunset. If, carried away by the enthusiasm this magnificent sight invariably arouses in us, we take a photograph of it, the result is analogous to a girl dressed in some fancy summer costume, and the same girl draped in a mourning dress. The outlines are truly the same; but, whereas one is radiant in a rich and, let us hope, harmonious colouring, the other is levelled down to a dreary monochrome. There are not many photographers who would not welcome a method whereby they can procure a perfect rendering of whatever colour they may have in the object they are photographing, if this method is a certain, simple, and inexpensive one. Several ways are indeed known whereby photographs can be procured in colours, but they are hardly likely to adjust themselves to the requirements of the ordinary photographer, and, though the results are in some cases perfect, and the methods are absolutely scientific, yet the range and the extent of the operations necessary to attain a satisfactory conclusion are better fitted for the experimentalist than for the normal type of photographer.

In this article I shall endeavour to explain a method whereby anybody who is able to take an ordinary photograph in monochrome can, with practically no more trouble whatsoever, take photographs of places, people—in fact anything—in all the colours of the original object. Now, inasmuch as it adds considerably to the pleasure and chances of success if we understand the why and wherefore of our actions, there is no reason that the art of taking photographs, either in monochrome or in colours, should be an exception; I, therefore, intend to explain the theory of this process. To start with, it is known in America as the "McDonough process of Colour Photography," and in England the name of Dr. Joly, of Dublin, is also coupled with that of the American, as they were both workers on the same track, and their descriptions are simultaneously published. Now, the reason we are able to see objects is that luminous rays proceeding from the sun fall on them, and are reflected from the object and received by the eye, and carried from the eye to the brain, where the impression of the object is formed by the brain. This, however, does not explain the phenomena of colour, as the direct rays of the sun appear to our eyes as being white. We must proceed to analyse, therefore, these rays of white light. To do this we place in the path of the rays a prism of glass, which consists of a piece of glass one side of which is inclined to the other. The effect produced on the ray of white light is to scatter it into a band of colours called the spectrum, as in fig. 1.



R=Ray of Light.
P=Prism.

FIG. 1.

These colours are in the following order: red, orange, yellow, green, blue, indigo, and violet, and, furthermore, it will be seen that the red is deviated very much less than the violet. To cause this spectrum to return to white light again we simply place another prism in its path, of course inverting the prism, and we get white light again. From this experiment we learn that white light is really of a very composite nature. Now, suppose we take a piece of red glass and hold it up to the sun, we no longer see the sun white, but, instead, it is red. Why is this? Well, we have shown that white light consists of several colours, among them being red; therefore the explanation is that we have, by placing the red glass in the path of the rays of white light, prevented all the rays of which the light consists getting through and producing their impressions on our brain except the red rays. This principle will apply equally as well to any other colour. We, therefore, understand that the reason we see an object in any particular colour is because there is some material in that object which is capable of cutting off, or absorbing, all the other constituents of white light except the dominant hue of the object. If we proceed further, it can be shown that every colour which we know of is capable of being formed by a combination of three colours, viz., red, green, and violet. Thus pink is a mixture in certain proportions of green and red and yellow of red and green, and so on for any colour other than one of these three primary ones. We will return to this most important observation later on. It must, of course, be clearly understood that all these remarks remain as concrete facts on account of their relationship with the human eye. Let us, therefore diverge for a short space and try to understand what part the eye plays in our sphere of action. The eye, for the sake of our inquiry we will take as consisting of two parts, viz., the lens and the retina. The lens of the eye acts in the same way as the lens of our camera, viz., it collects the rays of light and focusses them on the retina, which is the equivalent in the human body to the focussing screen of our cameras. The retina is connected with the brain, and so the image formed on the retina is conveyed to the brain and produces an image of the object we are looking at. We must now proceed to another point in connexion with the human eye, viz., the duration of time required for a stimulus of light to act on the retina and produce a definite sensation. We cannot estimate this exactly, but we know it is very short, as otherwise we should not be able to see an electric spark, which is almost instantaneous in its appearance and disappearance. Further, this momentary stimulus excites activity and change in the retina which lasts a measurable period. This duration of the sensation after the stimulus has ceased may be so pronounced, when the stimulus is strong, as to give rise to a definite "after-image." We can see this for ourselves by looking full at the sun for a few minutes and then turning away, when we shall see an after-image

which may last some time and is very appreciable. If one stimulus follows another at a very short interval, we get what seems to be a single stimulus, but which obviously is really only a combination of the two separate stimuli, coalesced into one. The importance of this will be seen hereafter. We can easily prove it, however.

It has already been stated that white light can be formed by blending together three primary colours. Now if we produce a separate stimulus from each of these colours with a very short interval between them, we shall get a white sensation. We can easily do this by taking a circular white disc of cardboard and painting three sectors on it with each of the primary colours, now rotate it rapidly and the disc will appear white. By now I think you will have fairly grasped the idea that any colour we see can be formed either by one of three primary colours or by a combination of them. It is interesting to note how this is explained by physiologists by an actual study of the characteristics of the human eye. There are two recognised theories—known as the Young-Helmholtz and Koenig's. By the former the three primary sensations we have already spoken of, viz.. the red, green, and violet, are represented in the eye by a separate set of nerve fibrils. One set is sensitive to red, another to green, and the other to violet. To therefore produce white light, we must cause an equal stimulus to each of these fibrils; again, a compound colour —*i.e.*, a colour composed of a mixture of the primary colours—would be caused or recognised by our brains through the proper proportionate stimulation of the corresponding nerve fibrils. It will, of course, be at once perceived that the absence of any colour produces black, which is equivalent to a non-excitation of any of these nerve fibrils. Here, again, we can argue back to the three-colour theory ; let us look again at fig. 1. At first you might naturally suppose that there would be a nerve fibril for each of the colours of the spectrum, but our natural instincts seem to contradict this supposition, because nearly any one, when asked, say, what orange is, will at once say that it is a combination of red and green. If we go into an actual measurement of the spectrum, we should find that, though the sensation produced by a mixture of red and green was the same as the pure orange of the spectrum, yet the stimulus requisite to produce the sensation is not the same. But we are diverging from our path. Let us now see what Koenig's theory is.

Koenig states that there are four primary colour sensations—blue, green, yellow, and red, and further considers white and black as primary visual sensations. But Koenig also places these sensations into three groups, viz., red and green, yellow and blue, and white and black. For each of these pairs he states there are two substances in the retina which are subject to anabolism and katabolism respectively, which means that they are subject to a process of building up (anabolism) and to a process of destruction (katabolism).

Since the material which is subject to these contrary actions is already complete and to hand, it follows that the first action which takes place is a katabolic one, followed by the reaction of anabolism. I hope this is quite clear.

Thus we perceive a white, because white light falls on the retina and causes a *kata*bolism of the white-black substance of the retina, which katabolism produces the sensation of white in our brains. When we take away the white light we remove the cause of the katabolism, thereby causing an anabolism of the white-black substance, and producing the sensation of black. The other two substances of the retina are only sensitive to or affected by the yellow and blue, and red and green stimuli respectively. You will see that we can explain any colour sensation by either of these two theories. Thus we say, arguing on the Young-Helmholtz theory, that an orange sensation is caused by a properly proportioned stimulation of the red and green nerve fibrils, the violet nerve fibril remaining unstimulated and therefore inactive; while, if we adopt the Koenig theory, we say that the red and green substance, and the yellow and blue substance in the retina are both subjected to a katabolic action, this katabolism in the red and green substance producing the sensation of red, while in the yellow and blue substance it causes the sensation of green, the fusion of these colours causing the sensation of orange. Both theories have their supporters, but it would be quite out of place for us to attempt to differentiate between their respective merits.

As the Young-Helmholtz theory is possibly the better known of the two, and is the more easily understood and applied by the average individual, we shall adopt it for the rest of this article.

Now that we have so fully gone into the question as to what colour is and how it affects the eye, it only remains for us to apply our knowledge to some photographic method, and the result should be a photograph in colours. We will see how we can best do this. Now, since we have adopted the Young-Helmholtz theory of colour vision and are consequently fully aware that we can form white light by mixing the three primary colours together, and, again, since we also know that the human eye is not capable of differentiating between colours, provided the stimulation of the nerve fibrils producing these colours come sufficiently close after one another, it therefore follows that, if we take a piece of glass or paper and rule it with fine parallel lines of the three primary colours one after the other—*i.e.*, red, green, violet; red, green, violet, and so on—the sensations produced by their respective stimuli will follow so closely after one another that the eye will not be able to differentiate between them, but will blend them together, and consequently we shall get the sensation of white light. Of course, if the lines are ruled too coarsely, the stimuli thereby produced will not follow sufficiently rapidly after one another, and we shall then see each colour separately. It has been found out by experiment that, if a piece of glass or paper is ruled with three hundred lines to the inch, *i.e.*, one hundred lines of each primary colour to the inch, the eye cannot differentiate between the sensations produced by each stimulus, and consequently we perceive the glass or the paper as if no lines were there at all, *i.e.*, we perceive it as being white. This effect is rendered better by holding the glass or paper a short distance from the eye, say, about a foot or so away, as then the respective stimuli are not so strong, and the fusion of the colours is better. Now, of course, it obviously follows that to produce a colour all that it is necessary to do is to cut off those rays which we know are in the three colours, inasmuch as they are a portion of what white light is, which are not wanted to form the particular hue we require, and the result will be that we shall have only the properly proportioned constituents left, the blending together of which will produce the colour we want. Now the question arises by what means are we to get this cutting off of the rays that we do not require? Here, again, the answer is self-evident. We simply block them completely out by cutting them out with black, or, in the case of certain colours, it may not be necessary to completely annihilate them, but rather to only tone them down. We do this, of course, by using a lighter shade of black, and thus prevent all the rays from that particular colour passing through.

Now, all this toning down or complete destruction of the respective portions of our three primary colours can be photographically performed with the very greatest nicety. As every photographer knows, an ordinary photographic negative consists of an image of various densities corresponding to the several intensities of the illumination of the object; therefore, if in contact with our dry plate we place a piece of glass ruled as described above, we shall obtain what we want. This is very obvious, but I will explain it again. When the light passing through the lens falls on the red line of the screen, the effect is to prevent all rays but the red from passing through. Now, let us suppose that we are taking a photograph of a lady with a red dress on. Here we shall find, on developing our negative, that the dress is composed of a black deposit. Examine this with a magnifying glass, and you will see that what you took for a continuous black deposit is not really so, but only a third of the area of the negative, in that portion devoted to the dress, is black? Why is this? Well, simply because the only rays that formed that portion of the negative were of a red colour, and, consequently, were only able to pass through the red lines; no light having passed through the green and violet lines, the plate underneath them has suffered no change, and so it appears transparent. Now make a positive from this negative, and the reverse is, of course, observed, viz., that there are now two black lines to every white line that the dress shows. Now, if we place this positive in contact with the screen we placed in front of our dry plate, taking care that the registration between the lines of the positive and the screen are correct, *i.e.*, the transparent line in the positive is under the red line of the screen, we shall get our photo-

graph in colours. Why? Well, look at the dress portion. In the place under the red lines of the screen, our positive is transparent, and consequently the red light passes through it, while underneath the other two lines, there is a deep density sufficient to entirely prevent the rays of the light from these two colours passing through and producing an impression on our retinas. Similarly it will be observed that, if we examine the portion of our picture devoted to the face, here we shall find a deposit underneath those lines of our screen which are not required to form the flesh tint, and the only light which passes the screen will produce, through the stimulation they cause to our nerve fibrils, the sensation of the colour. Should two of the lines of our screen pass light through, then, owing, as I have already explained, to the rapidity with which the stimuli produced by these two rays respectively follow one another, the nerve fibrils in our eyes are not capable of differentiating between them, and so they become fused together, and produce the sensation of the mixed colours. This application of a mechanical contrivance to this characteristic of the eye is, indeed, very clever, and will be greatly appreciated by those who have clearly followed my remarks.

Any colour effect which we observe in our picture can be explained on this principle, which I have endeavoured to explain as clearly as possible, and it will be found to be most interesting to take the different colours and analyse them for oneself with the aid of an ordinary magnifying glass. These colour pictures may be as easily produced on paper as on glass, for, instead of having the parallel lines ruled on the glass, we can have them printed on the paper, which is then coated with a sensitive emulsion, which, owing to its thinness, is transparent enough for our purpose; then we make a print in the usual way from the negative we have taken through the ruled screen, and if we register our lines correctly we shall of course get our picture in its correct colour values. Naturally, should we place the red record over the blue line, the result will be completely wrong, not to say ludicrous. These paper prints are in some ways preferable to the coloured transparencies, as the contact between the colour lines and the positive is more optically perfect, owing to there being no air space intervening, and consequently, no matter at what angle of incidence we look at our picture, it will always give correct colour values; while, in the case of the glass positive, if we place our eyes too much on one side, owing to the air space between the screen and the positive, we may see green when it ought to be red. The remedy is obvious, viz., hold the positive straight. Now, the only obstacle to the immediate realisation of our scheme is that the characteristics of the photographic plate and the eye are not the same. To the eye there is no impression, that we are aware of, produced by any stimuli beyond the violet rays; but, if we throw the spectrum on to an ordinary photographic plate, on developing the plate we shall find that there is a very perceptible action beyond the visible violet portion. This action will be also much more pronounced when we use strong sunlight for our experiment, and in this case we shall, moreover, observe that there is what we may call an exaggerated action in the visible violet and blue portion. Now, it is obvious that, since our unaided eyes do not observe these phenomena, we must get rid of them by some means, as otherwise our colours will be wrong. Fortunately, we can very easily fulfil our desires in this direction by the following simple method: If we place a piece of glass coated with a film of gelatine, which is stained a pale yellow or lemon colour, in front of the lens, we shall find that under normal conditions the ultra-violet rays will be cut off. If the sun, though, is shining at the time, we shall have to stain our films to an orange colour to keep the balance of the colours correct. We further can assist the action of these "ray filters" by staining the dry plates on which the photographs are taken. It requires, I fancy, no explanation, after what I have already written, when I state that these dry plates are adjusted as regards their chromatic properties—that is, their capacity for rendering the colour values in the negative correctly—to the densities of the lines in the three-colour taking screen. Naturally, if we either have our filter in front of the lens too darkly stained, or if we stain the dry plate itself too deeply, we shall go and cut off rays of light which are visible to our eyes, and therefore are required for our work. You will, therefore, understand that the filter in front of the lens has to be endowed with the following properties:—

1. The capacity to cut off the ultra-violet rays.
2. The capacity of toning down the too pronounced violets and blues, when the light is strong.
3. The capacity of performing 1 and 2 without interfering with the action of the other rays or of causing a disproportionate action of these other rays.

You will now understand that the requirements to produce a correct colour-value negative resolve themselves into three practical working details:—

1. The filter must be of a density to adapt itself to the circumstances of the light at the time the photograph is being taken.
2. The lines of the screens through which the image formed by the lens has to pass to be split up into its three primary characteristics must be parallel and of an equal width, and sufficiently finely ruled.
3. The dry plate itself must be adjusted to the intensities of the screen and the ray filter.

I do not fancy that there is anything here that requires any further explanation at my hands, as the facts are very self-evident after what I have already stated.

As regards the characteristics of the "ray filter," or, to use a very much better term, the "chromatic balance shutter," it must be capable of adapting itself to the conditions of the light at the time of photographing our object. When the sun is shining we have a disproportionately strong action of the blue end of the spectrum; we, therefore, to get our chromatic balance, must tone down these rays by using a chromatic balance shutter of an orange colour. When the sun is not shining or the light is not very intense, were we to use this same orange shutter, we should be cutting off normal blue light waves which are required in our photograph, and therefore we should get a predominance of the red and green colours. We must, therefore, use a chromatic balance shutter of a lighter shade of orange, *e.g.*, pale yellow. This will have the effect of cutting off any ultra-violet rays there may be about, but will not cut off any of the visual rays. Inasmuch as it is a nuisance to carry two chromatic balance shutters about with us, the difficulty has been got over by making them so that our two requirements may be fulfilled in the one instrument. We have a circular frame which fits into the outside flange of our lens. In this frame there are three pieces of mica—one of them is stained pale lemon and the other two are stained an orange colour. The pale lemon one stretches across the whole area of the frame, forming a case work of pale yellow; the two orange ones are in the form of sectors of equal proportions; we can, therefore, cause these two orange portions to either overlap one another, in which case our frame will show that half the area is composed of a pale yellow ray filter, and the other half of a double thickness of orange filter; or, if we wish to, we can by moving one of the orange set of sectors. I should have, perhaps, previously mentioned that the lemon filter and also one set of the orange sectors are fixed, but

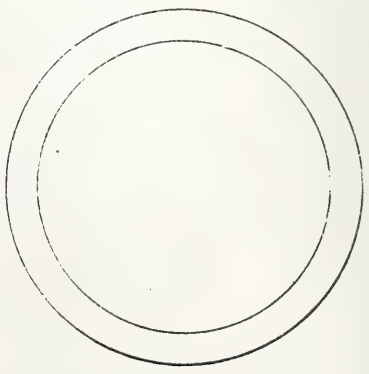


FIG. 2.

that the other set of the orange sectors is movable, so that you can move it so that it falls over the exposed portion of the lemon filter; or, by turning it in the opposite direction, you can make it fall over the other set of orange sectors—have a ray filter which consists of the lemon base and an equal area of orange filter. The various diagrams may help to explain this chromatic balance shutter.

In fig. 2 we have diagramatically represented the appearance of our chromatic balance shutter, with only the lemon ray filter fitted in the frame. In fig. 3 we have our complete shutter consisting of

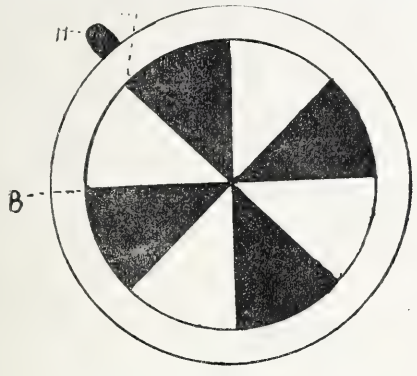


Fig. 3.

the lemon and one set of orange sectors fixed, and the other set movable by means of the projection, H. In fig. 4 we have this same shutter with this second or movable set of orange sectors closed over the exposed portions of the lemon, which are illustrated in fig. 3. It will be noticed in fig. 4 that H is now at B, whereas at fig. 3 it was

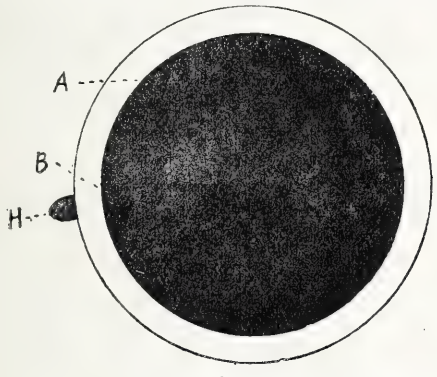


Fig. 4.

at A. The points A and B are points on the rim of the frame of the chromatic balance shutter, A, corresponding to the position of the movable section when our object is illuminated with diffused light, and B when we are are working in strong sunlight. It is, of course, possible to place the movable sector half way between A and B, and this position will depend on the quality of the light at the time. This shutter must be placed in front of the diaphragm of the lens, as otherwise the rays passing through it would not cross and blend together, and so we should get a patchy negative owing to the differences of the light intensities falling on it.

In practice it will be found that there will be little or no difficulty in correctly judging what "strength" of ray filter should be used, as our common sense will generally be sufficient to ensure success. Lastly, the exposures are naturally somewhat longer to produce a correct colour value negative than to produce an ordinary one, as the processes of filtration, which the light has had to go through before reaching the dry plate, have weakened its actinic qualities; but, nevertheless, the exposures are very well within the region of practical photography, a few seconds in a properly lighted studio yielding perfect results. All the apparatus necessary for working this process will shortly be put upon the English market, as the American company which is exploiting it has established an agency in London, the address of which is—The Natural Color Photo. Co., 9, Birkbeck Bank Chambers, Southampton-buildings, Holborn, London, W.C., and, if any one who is interested in the process can find time to call there, the results they will be shown will, I know, be more convincing than any words of mine as to the perfection and the practicalness of the system. The cost is also such as to place it at once within the reach of any amateur or professional photographer. I hope shortly, through the courtesy of the editor of this Journal, to publish an article on the practical working of the process, and this will be found to be a not unsuitable sequel, I trust, to the present attempt on my part, to explain the theoretical considerations on which this method is founded.

Arthur V. Kenah.

THE PERMANENCY OF TONED BROMIDE PRINTS.

The following *précis* of an address by Dr. Otto Katz of Charlottenburg before the Freien Photographischen Vereinigung of Berlin, which is reported in full in the current issue of the *Photographische Rundschau*, may be of interest as throwing additional light upon some of the subjects touched on by Mr. Welborne Piper in our last issue.

Dr. Katz points out that it is generally assumed that the cause of the fading of uranium-toned bromides is due to ammoniacal fumes in the air, on the hypothesis that gaseous ammonia will act on the red uranium ferrocyanide the same as liquid ammonia, but he states that no proof has yet been advanced, and that it is extremely unlikely that the very small proportion of ammonia, which according to the researches of Levy, Fresenius, Fodor, and others, is about 0.025 milligrammes in a cubic metre, will act, and still less likely in that some of this even is combined with carbonic or nitrous acid.

With regard to his own toned prints, although they had been kept in air containing a fair amount of ammonia, not the slightest trace of fading can be detected. In order to determine how far ammonia does act on the tone, prints were exposed under a glass plate to an ammonia atmosphere for eight weeks and scarcely any action could be traced at the end of the time, though possibly the tone became a little dirtier. When the atmosphere was saturated with aqueous vapour as well, however, a decided change was noticed. It may, of course, be advanced that the above conditions are not such as a print is submitted to, for the framed print can only be subjected to very slight changes of air.

Whatever may be the cause, there is no doubt that a large number of prints, toned with uranium and ammonio-citrate of iron, more or less quickly spoil, and Dr. Katz unhesitatingly condemns, as the main cause of the fading, the mountant with which the prints have been mounted. It may happen that a beautifully toned print, after it is mounted, even during the drying begins to bleach either as a whole or only in parts; and there is finally left a faded, yellowish, yellowish-brown, often also a reddish or by partial bleaching a spotty print. If this fading appears very strongly, it is seen at once, but often the change in the beginning is so slight that the tone has so slightly altered that it can only be determined if the original tone has been kept in mind. Before everything else the beautiful velvety colour is first lost, and it is seen that in time the fading proceeds apace and the picture alters still more. If this fading makes its appearance on the mounted prints, it is always in the fine details in the faintly toned parts first, for instance, in the faintly tinged sky, which will often become snow-white, and in the faces of portraits, &c. The time in which the fading appears differs, sometimes it is during the drying, often ten or fifteen minutes or later. In order to see these changes it is advisable to have two prints equally toned, and to mount one and keep the other unmounted. Roundly it may be said that every toned print suffers in mounting; all the usual mountants were tried by Dr. Katz with similar disasters, and in order to prevent them numerous experiments were undertaken, and the best remedy was found to be the admixture of a little of the uranium intensifier itself with the mountant immediately before using the latter.

Since this discovery very little trouble had been met with, at least in two years no fading had been detected, but occasionally another trouble had been encountered, and that was the formation of numerous minute white spots which almost always showed when examined under a glass a central blue crystal or amorphous blue mass, and it might be assumed that the intensifying medium had been abstracted to form the blue spot, which was in all probability Berlin blue. It was further found that it was necessary to add fresh intensifier to the mountant, that which had been frequently used was more liable to this trouble than any other. It was also found that the commercial mountants did not all behave alike: with some very slight fading occurred at first, but this gradually increased; with others the print was totally destroyed soon after mounting.

Bromide prints toned blue and green with red prussiate of potash and ammonio-citrate of iron—where, of course, uranium is not present—showed the same phenomena.

As to what the substance in the mount is that causes this fading is not quite clear. A series of the usual preservatives, carbolic acid, &c.,

were tried, but they had no effect, and therefore the cause must be looked for in the mountant itself. It was further noted that different sorts of paper behaved differently.

Another peculiar change to which uranium-toned prints are liable is a metallic sheen, which first, and in some cases, only appears in the darkest portions of the picture, which may appear in fourteen days, or only after weeks and months. This iridescent stain is well known as occurring on intensified negatives, although little has been published about it, and no explanation given of it. It must be an extremely thin film on the surface, for Dr. Katz cut films with a microtome and examined the stained and unstained portions, and could detect no difference.

Dr. Katz points out, and rightly, that the chemical processes in uranium toning are somewhat complicated; there are various double salts formed by the ferrocyanide and uranium nitrate, the fundamental base, the silver compounds, the acids, and the potassium cyanides, and then there are the physical properties of the uranium

In the discussion which followed this excellent paper, Dr. Fritsch pointed out that the action of sulphuretted hydrogen must not be overlooked, nor the action of the paper itself; and, further, the humidity or dryness of the air was an important factor, and Dr. Kaiserling stated that the peculiar metallic glaze could be avoided by collodionising or waxing the prints, the last having been suggested by Mr. E. Cecil Hertslet some months ago.

With regard to the fixing of uranium-toned prints, sulphocyanide of ammonium dissolves the silver ferrocyanide, leaving the uranium salt untouched. Ammonia, on the other hand, will not affect the silver salts, but converts the uranium salt into a pale yellow uranate, with possibly some solvent action, whilst hyposulphite of soda or potassium cyanide will dissolve the silver salt, the former leaving the uranium salt in the form of a dark brown sulphide.

With regard to the white spots with blue centres it would seem feasible to assume that these are primarily due to decomposition of traces of ferrid or ferrocyanide in the image film, possibly also to traces of metallic iron in the wash waters.

As regards the obtention of brown or red tones, we have already pointed out that there are two distinct salts of uranium ferrocyanide, the one with a formula of $(UO_2)_5K_6FeCy_6\ 12\,H_2O$, which gives a brown tone, and another $(UO_2)_3\,K_2\,(FeCy_6)_2\,6H_2O$ which gives red tones. Recognition of this would do away with the necessity of any retoning after ammonia.

Mr. A. C. R. CARTER'S HISTORICAL FALLACIES.

Many of us regard art-journalists as impertinent interlopers, when they come into our midst, and, innocent of true photographic history and photographic processes, dogmatise rashly after the manner of their kind.

In Photograms of 1900 Mr. Carter on the *Salon* is rich, distinctly *flamboyant*. He sets to work with all the cocksureness of the flatulent journalist to award praise and blame, and record history in the spirit of a Rhadamanthus—who doesn't know his business.

He begins by comparing the *Salon* to the New English Art Club, and by saying "Each had its origin in the high-mettled protest against convention." This is a fairy tale, and we refer Mr. Carter to a study of the *Photographic Journal* and The British Journal of Photography for December 11, 1891, where he can read the true and unvarnished history of the origin of the "protest." Most photographers know this history, but regard it as a disgraceful episode in photographic life. The fight for recognition of new work was made against the Parent Society by its own members, and, years *before* the Salon started, the Photographic Society had recognised and medalled the new men, called variously Naturalistic, Impressionistic, or Pictorial. This matter is not now for dispute, it is solid fact which most of us *know*, and we can read in the papers cited. The *origin* of the "protest" was in no way creditable, and this prevented some of the best pictorial photographers from joining the "Linked Ring," while the subsequent "labours" of the Salonites drove some of their members to resign, including one of the best men they ever decoyed, Mr. Bergheim. To-day not many men of ability would deem it an honour either to have their pictures hung there or to be elected members of the Linked Ring. It was, after all, a mongrel copy of the Vienna Salon and the Solar Club—for photographic salons were previously conducted in *Vienna*, and based on suggestions which came from this side and from members of the Royal Photographic Society.

Those of us who know the origin of the New English Art Club can only laugh at the parallel and wonder why anybody writes such nonsense, surely an art editor knows that the best men of the New English Art Club *left* the Club for the Royal Academy; indeed, the Club has been aptly called a sieve for the Royal Academy. We would recommend Mr. Carter to "inform himself" as Mr. Whistler has suggested all critics should. As to the "Earnestness of these gifted intentions," he might, perhaps, learn too that the earnestness lay in the "chase of the shekel," &c. To us photographers such scribbling is either very shallow and insulting, or very pretentious and ridiculous, according to each reader's temperament.

Mr. Carter, in innocence of the secret springs of these movements, goes on to commit himself and to misrepresent painters. Truth to tell, painters at first opened their arms to photography, until they "found it out," and then they cursed it as unclean and false, and the position of the pictorial photographer has fallen in the art world instead of risen.

Mr. Carter then sneers in that delightfully childish cocksure way of his at the "purist;" we, on the other hand, do not recognise hand works on a photographic basis, or we should claim many a man who is claimed by the painter body, but not by the entire body, and many of us view as an impertinence such remarks from one who is no photographer, who has not even gained an ephemeral reputation in photography, who to us is a nobody.

It would be a mere waste of time to traverse the dull and inflated pages of childish "criticism," but the more glaring errors we must briefly chronicle.

Photographic portraits are spoken of as "highly introspective studies of character," assorted "Röntgen-ray grams" we presume.

"A man in the street" has given us the best criticism yet of Mr. Craig Annan's work, and, knowing the photographer's character, we feel confident that he will not be spoiled, nay, will probably smile knowingly at Mr. Carter's ill-proportioned gush.

Another amateur is spoken of as starting "fresh veins of versatility," or "new technical enterprises"—well, we all know this matter, and we smile. Mr. Carter's remarks on another prominent worker of the old days are simply absurd, and that photographer must feel, "Oh, save me from my friends!" and we would in all humility advise his friends to show no more of his work; but fatuity can go no further when this worker's "Photograms" are compared to Mr La Thangue's paintings. We happen to have heard Mr. La Thangue's remarks on this worker's earlier and better photographs—out of respect for a man who is in the shade, we refrain from printing them; but such penny-a-line gush is no kindness. Another photograph is a Degas in inspiration, we should have written in "fumbling imitation." Mr. Greatbach's work is not considered equal to the ineffectual "Day's work nearly Done." Mr. Warren is reported as having struggled with "difficult problems." Mr. Annan is represented as being the first to take light from darkness, when dozens of these were done years before Mr. Annan ever exhibited. Mr. Thomas is suggested as a successor to Mr. H. P. Robinson, because he has taken, we believe, subjects Mr. Robinson never touched.

Indeed, the nauseous gush over the least important photographs, the slighting of the better work of less pushing men, and the grandiloquent words heaped indiscriminately on nobodies are calculated to do us harm and to revive that distemper "swell headedness," from which so many of our degenerates suffer. Mr. Grove is hailed as a "new comer," and in the notice of the Royal Exhibition Show we learn that *gold medals* (*sic*) are awarded.

We like enterprise, and admire the enterprise of the firm of Messrs. Dawbarn & Ward, but we condemn such a publication as this, for our regard for photography in all its branches is genuine, and trust the publication in its present form has died with the century, and that "Photographs for the year 1901" will be a book of reproductions of the best and most typical photographs of the year—each reproduced

n the best style with a few added notes as to technical details, and hat the selections of the photographs of the year be left to the judges of the Royal Photographic Society's Exhibition, the Committee of the Salon, and the creator of the one-man Show, and that the 'cackle be cut," and the dull and useless photographs of corners of the Exhibition be omitted. Such idle and pernicious chatter as these vapid "criticisms" and false "historical notes" merely lower photography in the eyes of artists and the cultured public, and, above all, cause heart burnings amongst camera-workers, and tend to degrade all that is best and noblest in photography. We want results—*i.e.*, photographs, not childish bleat—and photographs, if they be good, need no showman—they stand or fall by their own merits.

ART-CIRCLE.

NEW CENTURY PHOTOGRAPHY.

[An Address delivered before the Oxford Camera Club, Monday, January 14, 1901.]

In the last three weeks the newspapers have printed numerous articles of a retrospective character. The lines of progress in the century which closed a fortnight ago have been traced for us by many skilful pens, and I have no doubt that most of us have read so much history this new year that we have become somewhat weary of it. Let us then, to-night, by way of change, look forward, along one of those open grooves of time which Photography is manifestly destined to traverse. The loose threads of experimental work which must be visible to the eyes of the contemplative photographer should convince him that this modern handmaid of the sciences is still far from the maturity of her beauty and utility.

The Mystery of the Latent Image.

Our knowledge of the action of light on sensitive silver compounds —the pivot, so to speak, upon which the whole of modern photography turns—is still vague. Precisely what chemical change takes place when your lens projects an image of a view or object upon a sensitised plate or film has not yet been agreed by the investigators who have studied the matter. Two principal theories have been advanced. One, that a sub-salt of silver is formed; the other, that an oxy-salt results from the reducing action of light; but, so far, neither can be said to satisfactorily establish the identity of that most elusive mystery of photography, the Latent Image. This branch of inquiry was last dealt with in this country by Professor Raphael Meldola, who, I believe, favoured the sub-salt theory. But since then much has been recorded which by no means simplifies the mystery. You do not require the action of solar or other rays to produce a developable impression on the sensitive salt of silver; simple mechanical pressure will suffice. Again, Dr. W. J. Russell has shown on many occasions that the exhalations from organic bodies, such as wood, leather, essential oils, and so forth, affect the silver salts in exactly the same way as light; whilst even inorganic bodies, such as sheets of metal, emit what we may for convenience sake term influences which also exercise light action, or its equivalence, upon sensitive plates and films. More remarkable still are the discoveries of Mons. Becquerel, M. and Madame Curie, and others, of an entirely new set of phenomena grouped under the explanatory heading of radio-activity. Compounds of uranium, barium, polonium have been ascertained to store up and retain a form of energy which, when received upon the sensitive plate, affects it in exactly the same way as solar light, viz., by reduction. This hasty glance at a most interesting series of phenomena, quite as wonderful in their way as the penetrative influences of the Röntgen rays, which have only an indirect bearing on photography, may serve to remind us how wide is the field opened out to us by a consideration of photographic action, and the variety of ways in which it is set up. The ultimate outcome of all these wonderful manifestations of photographic energy no man can tell, but that they are destined to have great influence upon the photography of the future is at any rate probable, for modern science moves in the direction of utilising all forms of energy, and it may not be wholly wide of the mark to conjecture that photography by what is known as invisible light will be practised in some form or another during the century.

Pigmentary Colour Photography.

Your President whose interest in colour photography is well known, has from time to time brought before you the colour-photography methods of Mr. Ives, Professor Joly, Professor Wood, and Mons. Lippmann. The first three, as you are aware, are based upon the principles of trichromatics; the fourth is an interference process. All of them have passed out of the experimental stage, but it is doubtful if any considerable further developments await them. It must be said that, beautiful and interesting as these pictures undoubtedly are, they do not realise the general, or, at any rate, the popular, conception of what a photograph in natural colours should be. To do this a pigmentary process is obviously called for, inasmuch as the paper print, and not the transparency on glass, is the outstanding aspiration of the public at large. Experiments with this object have been numerous, and, to quote an expression I have already used, there are several loose threads visible which might be worth attacking by some new-century experimentalist in colour photography. I will particularly allude to the uncompleted experiments of Mr. Matthew Carey Lea, the most recent investigator of note, who did much good work in pre-gelatine days, and who published, some fourteen years ago, the results of a number of experiments which certainly raised hopes at the time that a good start in pigmentary colour photography had been made. He experimented with the silver haloids, and produced by purely chemical means of the simplest nature a red silver chloride which exhibited a range of colour "from white to black through the following gradations: White, pale flesh colour, pale pink, rose colour, copper colour, red-purple, dark chocolate, black." Carey Lea, whose experiments with this photo-chloride of silver, as he termed it, were very exhaustive, concluded his memoir with the words: "I am persuaded that in the reactions which have been described lies the future of heliochromy, and that in some form or other this beautiful red chloride is destined to lead eventually to the reproduction of natural colours." Probably, of all those who have experimented with the silver salts, Carey Lea in his work came nearest to a fundamental attempt to prove that a wide range of colour effects could be obtained from a pure silver haloid—a necessary condition of a pigmentary method according to the practice of modern photography. Thus, from the days of Sir John Herschel in 1839 down to comparatively recent times, a vast amount of experimental work in pigmentary colour photography has been recorded, and the new century photographer who attacks the colour problem by the direct, as opposed to the indirect, method of trichromatics, will find awaiting him a wonderful and fascinating mass of data upon which to draw. The marvel is that this branch of work has been so studiously neglected, seeing that the desire for a solution of the problem is so widespread.

The Lenses of the Future.

The advances in lens construction which have been made in the last thirteen years, mainly due to the production of a number of glasses having qualities of refraction and dispersion that were not possessed by the flints and crowns of which photographic lenses, before 1888, were composed, have been so great that the photographer may be well excused if he believes that the opticians have reached finality in this important matter. In the typical anastigmat of the day you have an intensity of working aperture covering and defining powers, and freedom from aberrations such as the lens-makers of 20 years ago would not have thought practicable. At that time it must have seemed futile to insist upon the theoretical requirements involved in the construction of a lens in which, to select the two aberrations most familiar to all intelligent photographers, astigmatism and curvature of the field were either destroyed or minimised, for the necessary glasses could not then be had. But in these times a more favourable state of things exists. The formulæ of the mathematicians cause no dismay to the glass-makers whose catalogue includes scores of varieties, admitting of combinations which in the completed objective result in the transmission to the sensitive surface of an image practically free from optical error. The influences of these advances have perhaps shown themselves more in photographic work of a scientific character than in that of those with whom photography is only a trade or a hobby. It is to the former class that any fresh advances will probably make the strongest appeal. One respect in which modern lenses are more or less susceptible of improvement is that of correction for colour. The experimentalists in trichromatic photography, for example, would welcome lenses from which the secondary and tertiary spectra had been removed, and what it is convenient to style the condition of apochromatism in contradistinction to achromatism was secured. The perfect correction of a lens for all parts of the spectrum is, however, a matter in which the average photographer will naturally feel small interest. Tell him that the new century will place in his hands a photographic lens as perfect as mathematical and mechanical science can make it at a very considerably lower price than he at present pays for it, and he will, no doubt, be glad at heart. This is, of course, a natural development of the optical industry. So great are the improvements constantly

taking place in mechanical science that before long we may expect that, even in the production of such a delicate instrument of precision as a well-corrected photographic lens, hand work, in the chiefest conditions, will be dispensed with, and the inevitable fall in prices will follow the adoption of automatic machinery. There are also grounds for believing that the very forms of the lenses used for taking photographs will be changed. We are so accustomed to the curved surfaces of lenses that it would be a novelty and a surprise to have these surfaces quite flattened. More important still, photographs during this century may actually not require the agency of a lens for the formation of the camera image. Dr. Emerson, whose name as the author of "Naturalistic Photography" will be familiar to you, and who is deeply interested in many branches of progressive science, a fact which may be of interest to those who look upon him simply as an exponent of pictorial photography, tells me that he has in contemplation a system whereby photographs may be taken without the use of a lens, and that this does not mean the employment of a pinhole, the simplest expression of an image-forming system. Reflective, in lieu of refractive, agency may occur as a possible explanation of what at present is a point of some perplexity; but this is mere guesswork. Enough that new-century photography without the use of lenses has entered the field of speculation; its realisation will be another thing.

A Japanese School of Photography.

We have recently heard much of the so-called new American school of photography, and its probable influences on British work. Doubt h been thrown on the validity of the claims of our American friends to have originated anything new in pictorial photography. In the United States the expressive word "freak" is widely applied to printed images which, whatever artistic qualities they may be imagined by their producers to possess, so carefully conceal their method of origin as to engender disbelief that photography, as we commonly understand it, had anything to do with the preparation of the results. In this country it is far too soon to gauge the effects which these clever efforts to mask photography in aiming at results expressive of the personal equation in pictorial work may have upon native ideas. As in all movements of this kind, a very long war of words remains to be fought before the work of the American school—a school without a system of teaching, it may be noted—has exerted its full effects, and either becomes assimilated by British workers or consigned to the limbo of useless experiments. But it may, I think, be taken as axiomatic that that much-dreaded person, "the man in the street," before whose withering frown even Cabinet Ministers, military commanders, great actors, popular authors, and other persons who live by the exercise of the creative instinct, have been known to quail, will not tolerate photographs which are deficient in likeness, verisimilitude, and recognisability. Whatever place amongst methods of graphic expression pictorial photography is finally destined to reach, it will probably not be by confusing the popular intelligence and provoking the ridicule of those who are in a position to put before us personal manifestations of art feeling independent of the trammelling influences of optics, mechanics, and applied chemistry. But from America I will ask you to follow me, in imagination, to a country which seems destined to wield no inconsiderable influence on European civilisation in the near future. I mean Japan. How soon will it be, I wonder, before we shall be discussing in this country an exhibition of photographs by the new Japanese school? Within my recollection Japan wholly relied upon Europe for her photographic supplies, but this is a state of things in course of rapid change. Japan to-day is busily engaged in making her own materials for photography. In a few years' time she will be independent of foreign markets. But more than this: there are distinct signs of the growth of a native school of pictorial photography. In this matter what I will term the innate artistry of the people asserts itself. I have seen portraits and landscapes, delicately coloured by hand, as well as in monochrome, which have a distinct charm and individuality difficult to express in words. In composition they are simple and direct, and each bit of work, whatever its nature, is characterised by the refinement and taste one associates with the artistic productions of the land of Hokusai. I think we may safely anticipate that Japanese pictorial photography will unmistakably reveal itself to us early in the century, although it is perhaps more certain that European photographic science and manufacturers will sooner feel the direct influences of the England of the East. A friend of mine has suggested to me that in the important detail of camera construction we shall not reach the acme of portability and lightness until the Japanese workman has shown what he can do with the slender materials he knows so well how to fashion and handle. I should not like to close this reference without mention of the fact that a British photographer, the late Mr. W. K. Burton, who lived in Japan for many years, was responsible for the dissemination of a great amount of photographic knowledge there which is now fructifying. Nothing would cause me so little surprise as to see Japan taking the lead in trichromatic printing, a branch of work which has not reached its fullest development in Great Britain, but which at the present time is the subject of close experiment in Japan, where the colour sense, if I may so express myself, is probably keener and acuter than in these sombre islands of the North Sea.

The National Records and Photography.

Clearly destined to remain indispensable in modern art, science, and industry, photography in the new century should look not without hope to more recognition at the hands of the State than it has hitherto received. This is an age of printers' ink and paper. Authorities are agreed that the greater part of the printed matter now sent out from the press is doomed to early destruction. The records of our times are being written, if not in sand, at least in a substance not more capable of resisting the tide of years—wood pulp. Of the myriads of books and newspapers, composed of such highly fugitive materials as paper and ink, that are being issued from the press, what residuum will be left for the historian of the 21st century to examine? Photography, by its own work, and not what istypographically printed about it, will live, it may be conjectured, to tell the story of its own evolution and progress, in reduced platinum and silver, and it is therefore consoling to note that the Government departments are showing increasing inclination to take advantage of the quality of comparative permanence which photography affords in the production of official documents. Still, what is done in the matter is at present small and half-hearted. It is disconcerting to reflect—and I have been assured that this is the case by historical students—that what may be termed the first-hand history of the country is in process of rapid decay. By "first-hand history" I mean the priceless manuscripts at the Rolls Office and other centres of national records, which, through constant handling and the changes which Time induces, more particularly in matter of organic origin, are fading or decaying. It would be a great step, but one for which posterity would be grateful, if the State resolved, before it is too late, that its essential records should be reproduced in permanent form by means of photography. It is tolerably certain that, unless some such course be taken at an early date, the student of history in future centuries will be searching for his references literally in a dust heap composed of decayed skins and papers upon which here and there some undistinguishable hierogyphics in printers' ink or gallate of iron will be faintly visible, and the meaning of which no man will be able to fathom. All the same, while we congratulate ourselves on the permanent nature of photographic impressions, let us not be deaf to the suspicion of fugacity which has decidedly attached itself to the now universal negative process, that of silver in gelatine. Recollect that this development of emulsion photography is barely a quarter of a century old, hence sufficient time has hardly elapsed to enable us to speak with confidence as to the unalterability of the results, especially in face of the undoubted evidence, recently published by Dr. Roberts, that star images in gelatine actually fade. I possess many glass collodion negatives nearly half a century old which in fineness of deposit and sharpness are, to my eyes, perfection. The images in fact, so far as it is possible to discover, have not faded or deteriorated in the least. The careless way in which modern gelatine photography is so often worked makes it doubtful if, 25 years hence, the larger number of negatives that have been made will stand the test of such a critical examination as will most collodion pictures. But it is impossible to foresee what Time, the greatest of all chemists, has in store for us in photography or anything else. I conclude with the new-century aspiration that, as facilities for an adequate study of photography in its manifold divisions and subdivisions do not at present exist, the great teaching centres will one day consider it desirable to include the subject amongst the higher branches of scientific work, and that recognised professorships of photography will be instituted at the Universities.

Thomas Bedding.

PHOTOGRAPHY IN 2001.

Our contemporary, "The Croydon Advertiser," prints the following humorous report of a meeting of the Croydon Camera Club, which is supposed to take place a century hence:—

"The usual weekly meeting on Wednesday last was the first regular one held in the large lecture theatre which the County Council recently built for the Club, and which was inaugurated last month by His Imperial Highness the Duke of Uganda.

"The evening was mainly devoted to a discourse on 'Subtelluric Photography,' by our renowned townsman, Mr. Alderman John Vokes, F.R.S.

"In opening the proceedings, the President (Sir Hector MacDuart) dwelt upon the national importance of Mr. Vokes' discoveries in enabling those who guard our shores to distinguish the approach of the new ninety-knot submarine destroyer at a distance of not less than twenty miles.

"Mr. Vokes stated that, although he had brought a carefully-prepared 'phono' with him, instead of grinding it out of them, he should treat them to a bit of old English—not old Scotch—and just speak to them in the old-fashioned way, which, no doubt, lecturers adopted when the founder of the Club used to preside over their meetings. Mr. Vokes then explained the remarkable steps whereby he had succeeded in evolving from the old X-ray apparatus and the yet more ancient Jena lenses the instrument which he designated the Zed-Ray-Graph. By availing himself of the unique properties inherent in that singular elemental atom discovered by the Duke of Surrey, known as 'Kameleon,' he had obtained such astonishing recording power that, using Rattan's colour-philm, he had got surprisingly vivid pictures displaying the marvellous alchemy of the earth in progress forty or more miles beneath its surface. The circulation of the molten matter, and all its splendid colour effects, were most startling when the muto-kroms were projected by Mr. A. E. Itakes on to the invisible screen. Following the above, the lecturer showed some results of surveys made with the instrument at a depth of from three to five miles, and stated that, as they could all see for themselves, Croydon was built over a diamond deposit far more important than any which they had read of in South Africa. Now that diamonds were manufactured so cheaply, the discovery was of no value, but, had it been known even a hundred years ago, it would have revolutionised our stately town. It was strange," he added, "that this enormous deposit should have been found underlying Croham Hurst, which was bought early in the twentieth century for the insignificant sum of £100,000, while the precious stones under it were then worth untold millions. Other parts of Croydon might have diamonds underlying, but, in consequence of the enormous force of electricity in use in our streets and flats, it was impossible to use his delicate Zed-Ray-Graph except on such a comparatively isolated spot as Croham Hurst.

"Mr. Progers subsequently drew attention to his useful application of Mr. Vokes' apparatus which he has modified for microscopic investigation. In the course of his travels in the Western Soudan he had visited that old-fashioned settlement known as Krugeria, in which dwelt a people said to have trekked a century or so ago from the United States of South Africa. Here the old and dangerous sanitary methods were still practised, hence he had been able to obtain pictures of invisible bacteria which are now extinct in England. The lecturer then showed, by means of the muto-krom, a set of moving photographs of germs magnified twenty million diameters. They depicted typhoid and diphtheria microbes passing from a Krugerian sewer ventilator. Some discussion arose as to why the diphtheria germ was rendered purple and the typhoid scarlet. It was remarked that the latter became much quicker thinned out by the action of the air than the former.

"Later in the evening much interest was evoked by Mr. Itakes' muto-colour snaps. The picture of the Brighton mail rushing over Croydon at a distance of a quarter of a mile, with the moon shining placidly on it, and the fairy lights illuminating its crystal drawing-room, evoked much applause, which was renewed when there was shown a muto-snap of the collision which happened on the previous day between the Reigate aerial car and a Pickford's flying parcel machine.

"After the usual vote of thanks, the President announced that the hundred and fourth exhibition would open at the County Council Temple of Pictorial Art on February 20, when, in addition to the usual collection of animated portraits, a series of Speaking Likenesses would be displayed, including one of the tenth Marquis of Salisbury addressing his fellow-citizens on accepting the Premiership of the Imperial Anglo-Saxon Confederation."

INTERNATIONAL EXHIBITION AT BLAIRGOWRIE.

The following is a list of the awards, with a short critique of the exhibits:—

Open to All.

Class A (Champion).—This is a strong class, and competition in it was keen. The silver medal was awarded to "Words of Comfort" (9), by Alex. Allan, Edinburgh, a striking picture, in Mr. Allan's well-known style. James Burns, Edinburgh, gained the bronze with "The wind bloweth from the sea" (18), a picture which we commended warmly when it was awarded the gold medal at the Edinburgh Photographic Society's Exhibition. Diplomas went to James Patrick, Edinburgh, for his beautiful,

"A stilly hamlet home that vies
With any earthly paradise"

(14), which took the gold medal in the open class at Edinburgh; and "A Sorrento Boat" (12), by Henry C. Elliott, Naples, a panel picture with striking reflections. "Whence and Whither" (15), by Chas. F. Inston, was much noticed by visitors, the feeling of vastness and grandeur in the sea and sky being powerfully pourtrayed.

Class B (Architecture).—This is a small class, in which Chas. H. Oakden, London, has a popular win with "North Choir Aisle, Winchester" (34), clear in detail, yet free from any hardness, and beautifully composed. Frank C. Smithard gains the bronze medal with an effectively-lighted rendering of the "Triforium, Gloucester" (33); while Edward J. H. Felce, Northampton, gains a diploma for "The Monks' Lavatorium" (29).

Class C (Instantaneous Work).—This is a good class, the silver medal being awarded to "A Good Point" (51), by W. J. Croall, Edinburgh. The dog is, no doubt, standing correctly, but from the point of view the hindquarters seem rather "mixed." The bronze medal goes to T. N. Foulis, Edinburgh, for a pleasing little study, "Hairst" (53), and diploma to Ernest G. Boon, Alassio, Italy, "Beach Study" (56). Some surprise was expressed that "Stockholm" (52), by J. C. Warburg, London, should go unnoticed. Other noticeable pictures in the class are "Crossing the Bar" (48), by W. D. Brown, Lanark, a fine bit of work; and Walter Kilbey's (Richmond) focal plane work (48-58).

Class D (Flowers, Fruit, and Still Life).—A small class, with several good things, the silver medal picture, "Roses" (67), by Harry Quilter, Leicester, being a gem, the position of the flowers being "easy." Miss Maclachlan, Blairgowrie, gains the bronze with "Lily" (68), a graceful study of a graceful flower. A diploma is awarded to Edgar Scamell, London, for his series, "The Growth of a Nasturtium" (70), a most valuable contribution to horticultural illustration.

Class E (Stereoscopic Work).—This class, a novelty for Blairgowrie, has filled up remarkably well, and is a popular one with visitors. The silver medal is awarded to Richard R. Soper, Liverpool, for "Ludlow Castle," in No. 77 set, a gem of stereoscopic work. Laurence S. Wilks, Walthamstow, gains the bronze with "Cloisters, Hofkirche of St. Leodegar, Lucerne," in No. 87; and Dr. W. M. Stainthorpe, Saltburn-by-Sea, is awarded a diploma for "Sunbeams," in No. 84, but this will be withheld, as the judges have awarded him a special silver medal in this class for "Apples" (85), a very successful Sanger-Shepherd process colour stereogram.

Class F (Lantern Slides), champion.—This, as might be expected, is a small but good class. Graystone Bird, Bath, gains pride of place with his successful "Launching the Lifeboat" (92). John Beeby, New York, wins the bronze medal with "After the Storm" (96), a thoroughly satisfactory slide; and George Clelland, Edinburgh, is diplomaed for "Waiting."

Class G (Lantern Slides).—This is a very large class, containing a large number of splendid slides. George B. Bainbridge, Morpeth, has a magnificent set in No. 106, and his "Coffee Drinkers," an Egyptian scene, glimmering with sunshine, and reminiscent of Ernest R. Ashton's pictures, is awarded the silver medal. The bronze medal goes to Harry Wade, Manchester, for "The Mendicant" (119), although several preferred his "Crypt, St. Mary's Hall, Coventry." Diplomas are awarded Wm. Chas. Johns, Plymouth, for "Altar and Reredos, Truro Cathedral" (110), a slide showing an effective mount; and John Beeby, New York, "Clearing Snow after the Storm" (121), a fine slide, the horses' breath being a strong feature in the picture, the whole composing well. Several critics would have wished it in a higher position.

Class H (Lecturettes).—This is a very small class, only four entries, and the judge (Mr. H. Snowden Ward) has awarded two silver medals, on account of the excellence of the "lectures," to Walter Kilbey, Richmond, "Rapid Instantaneous Work," and W. A. Taylor, Liverpool, "Evesham and District."

Open to Professionals.

Class J (Landscape or Seascape).—This is a rather uneven class, silver medal being awarded to Wm. Reid, Wishaw, for "Horses in a Harvest Field" (136), a splendid study of three horses. Not a few thought this should have been in the figure study class, although the figures do not occupy the major part of the picture, they are undoubtedly the motif of it. The bronze is gained by W. B. Mercier, Perth, with "Harvest Time" (133), a pleasing picture, well composed. A diploma goes to Wm. Reid, "On a New Zealand Farm" (140).

Class K (Portraiture and Figure Studies, including Animals).—This is a large class, but the general quality of the work is not so high as in the other classes. There are, however, exceptions. D. Milne and Son, Blairgowrie, take premier place with "Lady Victoria Herbert and the Hon. Misses Gardner" (206), a beautiful group of a lady and girls dressed in white. The composition is excellent and the dresses beautifully rendered. John Spark, Perth, who has several fine things in this class, gains the bronze with "Portrait Study" (222), a satisfactory picture. A diploma goes to A. E. Lane, Llanelly, for "An Old, Old Man" (179), representing a fine old head.

OPEN TO AMATEURS.

Class L (Landscape or Seascape).—This is the largest class in the Exhibition, and the general quality of the work is high. W. J. Croall, Edinburgh, gains the silver medal with "On the Sand-dunes" (286), showing a pleasing play of light and shade, an object lesson in "something out of nothing." "A Study of Shipping" (280), by E. G. Boon, is awarded the bronze medal. The play of the reflections recalls a picture by Craig Annan. Jas. Burns, Edinburgh, "Over the Surf" (294), and Frank C. Smithard, Derby, "Threshing Time" (250), gain diplomas.

Class M (Figure Study and Genre, including Animals).—A real good class. Alex. Allan, Edinburgh, is awarded the silver medal here, with "Old Ann" (313), adjudged the best picture in the Exhibition, and to which we have already alluded. Miss Boden, Derby, wins the bronze with a delightful study of a head, marred by an suitable frame.

"Sometimes with most intensity
Gazing we seem to see
Thought folded over thought,
Smiling asleep"

(320). J. R. Clark, Whitehaven, "In Pensive Mood," and J. Owen Price, Birmingham, "A Country Lassie," gain diplomas.

OPEN TO MEMBERS.

Class N (Any Subject).—This class shows a marked improvement since last Exhibition. First place is awarded Alex. Geekie for "My Boy" (378), a pleasing study of a little lad's head, shown in a circular mount. The bronze goes to Miss Maclachlan, "Study of a Frieze" (362), already alluded to; and diplomas are gained by D. G. Monair, "In Dublin's Fair City" (379), and John B. Maclachlan, "The Crofter" (373).

Messrs. J. Craig Annan, Glasgow, and Wm. Crooke, Edinburgh, kindly officiated as judges.

The catalogue is a praiseworthy production, the cover being specially designed by Mr. George Murray, a Blairgowrie native, who is having a successful career at the Royal Academy schools.

A varied list of entertainments has been arranged for the week, including colour photography, kinematograph and lantern-slide exhibitions, concerts, lecturettes, &c.

News and Notes.

THE South London Photographic Society's Annual Dinner will be held at Anderton's Hotel, Fleet-street, on Saturday, February 16, 1901, at 6.30 p.m.

ROYAL Photographic Society.—Technical Meeting, Tuesday, January 22, at 66, Russell-square, at 8 p.m. "Imitative v. Creative" (a comparison), by W. Edwin Tindall. The Exhibition of Photographs by Mr. F. M. Sutcliffe, of Whitby, may be seen on presentation of visiting card at 66, Russell-square, from 10 to 4; Wednesdays, 10 to 1.

THE employés of Mr. Jonathan Fallowfield will hold their Sixth Annual Bohemian Concert at the Champion Hotel, Aldersgate-street, E.C., on Friday, February 22, under the presidency of Mr. F. W. Hindley. Tickets, price 1s., may be obtained of any of the employés, or of Mr. James C. Preece, Hon. Secretary, 47, Scrafton-road, Ilford, E.

DURING his lecture to children at the Society of Arts, Mr. E. Walter Maunder told his audience an instructive story. A certain lecturer in astronomy observed that some of the students were not paying due attention. "Mr. So-and-So," he called out to one of them, "will you be good enough to tell us of what the corona is composed?" The student thus addressed hesitated for a moment, and then blurted out, "I did know, sir; but I've forgotten!" The Professor looked at him, and then exclaimed, "What a calamity! Here we have the only man who ever knew the composition of the corona; and he has forgotten!"

MR. Fisher Unwin has published a war book by Mr. W. K. L. Dickson, entitled "The Biograph in Battle." It describes the author's actual experiences and hardships in the field. The author went out to biograph the war, and succeeded in obtaining many photographs from places where the camera can never have been known before. At times he was even in the firing line. Mr. Dickson accompanied General Buller's force to Ladysmith, and was present at Colenso; he subsequently joined Lord Roberts's force, and was able to biograph the hoisting of the British flag at Pretoria. The book is illustrated with 100 biograph photographs.

"COPYRIGHT Churches.—The verger moves with the times—at least, one does, says "The Daily Chronicle." Until lately when he has not been busy in delivering archæological lectures to gaping tourists his time has been filled by arguments and pleas addressed to amateur photographers. He loathes the irreverent snapshot which pictures tomb, or altar, or himself with casual indifference; and he laments the loss of commission on photographs which he used to sell—so now he has devised a way to cap the camera. He leads the sacrilegious one to a spot behind a pillar, and points meaningly to a printed sign hung on the wall. It reads, "This Church is Copyright."

THE Birmingham Photographic Society's Sixteenth Annual Exhibition will be held at the gallery of the Royal Society of Artists, New-street, from February 23 to March 2 next. The judges will be Colonel Gale, Dr. P. H. Emerson, and Mr. S. H. Baker, R.E. The Exhibition will be inaugurated on Saturday afternoon, February 23, at 3 p.m., and remain open from 10 a.m. to 10 p.m., from Monday, February 25, to Saturday, March 2, inclusive. In addition to the competitive section, there will be an exhibition and demonstration of modern advances in colour photography, an exhibition of apparatus, lantern lectures, and vocal and instrumental music. The Hon. Secretary is Mr. H. Vooght-Cornish, Athletic Institute, John Bright-street, Birmingham, of whom copies of the prospectus may be obtained.

THE Newcastle-on-Tyne and Northern Counties Photographic Association held their Annual Exhibition in the Y.M.C.A. Buildings, Newcastle, on January 7 and 8. The number of exhibits was small in comparison with some former exhibitions, but the "quality" was in every way up to the standard. The first silver medal was awarded to Mr. Harold Cookson for an ozotype entitled "A Country Farm Yard," a beautiful picture containing many of the live stock usually seen about such places nicely grouped, and where even the fractious pig was persuaded to take up its proper position. Mr. Cookson also showed a set of birds, taken from life, and other rural subjects. Mr. Walter Corder received a silver medal for a platinotype print of Durham Cathedral with its environments, a pretty little picture, and one that deserves the more praise because of a somewhat hackneyed subject taken from a new and interesting standpoint. It owes much of its beauty to the soft rendering of the Castle and Cathedral in the distance, the foreground of houses aiding the picture by throwing back the centre of interest. Honourable mention was also made of Mr. Corder's "Norwegian Club Hut," the interior of a rustic room, with several appropriate figures arranged in the window. Bronze medals were awarded to Mr. Geo. Bainbridge, J.P., for his "Caravan in the Sahara" (bromide enlargement), and Mr. W. Errington Cowan, "Rothesay by Night" (silver print), the former being an instantaneous view taken from a moving train at a very considerable distance, and the latter a quarter-plate showing the lights of the town and boats reflected in the water of the bay. There were also a large number of pictures sent in as a loan collection by Mr. Bainbridge, Mr. Worsley-Benison, Kodak, Ltd., and others, which were very much admired. Lantern slides were very well represented, the silver medal going to Mr. Philip Spence for a set of pretty pictures of Venice. Mr. Spence also got honourable mention for a very fine set of instantaneous pictures representing tobogganning at St. Moritz in winter. Messrs. Wm. Haig Parry and James Baty both received bronze medals for sets of landscapes, and Mr. Wm. E. Rowden for microscopic subjects, the winning set being sections of the spine of echinus.

Commercial & Legal Intelligence.

THORNTON Film.—The prize of a folding pocket Kodak, given every month for the best negative taken on Thornton film during the preceding month, has been awarded to Mr. H. C. Leat, Totterdown, Bristol, for his picture entitled "Clifton Suspension Bridge," taken in December last.

A Terrible Accident at a Photographer's.—An inquest was held at the Church Room, Richmond, last week, on the body of William Joseph Maloney, who was killed on the previous Friday evening by a fall from the window-sill of Messrs. Gunn and Stuart's premises, The Quadrant, Richmond.—Thomas Jones, a photo operator, in the employ of Messrs. Gunn and Stuart, photographers, said the deceased was employed by the firm as porter. On the day in question he was cleaning some windows on the third storey of the premises, when he fell to the pavement below and was killed instantly.—After further evidence had been given, the jury returned a verdict of "Accidental death."

RE Edgar Albert Willis, senior partner in the firm of E. A. and A. A. Willis, Photographers, Scarborough.—The above-named debtor, in the course of his public examination at the Scarborough Bankruptcy Court, before Mr. Registrar Bedwell, stated that he and his brother entered into partnership about ten years ago. He alleged their failure to have been caused through keen competition and bad trade. He did not know what capital they had, neither did he know the value of the stock when they commenced. The present stock he estimated at £386 14s. 6d.—The Official Receiver said he valued it at £75.—After the other partner had been examined, the examination was ordered to be adjourned until the next Court.

CLAIM for the Price of a Crayon.—At the Brighton County Court, on Friday last, before His Honour Judge Martineau, Joseph Worthington Ford, of 25, Richmond-place, Brighton, artist, sued Thomas Clarke, of 3, South-avenue, Queen's Park, Brighton, to recover the sum of £2 10s., the cost of a crayon drawing, executed by him for the defendant's wife.—The Plaintiff, in the course of his evidence, stated that he was engaged to make a crayon drawing from a photograph of the defendant's wife. He executed the drawing and delivered it to the lady, in whose possession it remained for six weeks. He had applied for payment three or four times, but was unable to get the money. He received the order from Mrs. Clarke.—His Honour, after comparing the drawing with the photo, said it appeared to be correct, and gave judgment for the plaintiff for the amount claimed.

AT the Guildhall Police Court, on Friday last, before Mr. Alderman Smallman, Charles Frederick Matusch, aged 43, managing director of the Griffin Manufacturing Company, Ltd., of Appold-street, Finsbury, and Richard Harvey, aged 28, were charged, on remand, with having conspired to defraud a large number of firms.—It was stated that there were 112 cases against accused, involving a sum of £4,500.—Mr. Louis Wilson, managing director of Messrs. Wilson and Co., photographers, of St. Swithin's-lane, Aberdeen, said he sent specimens of photographs to Messrs. Leppoe and Co., in reply to a request for quotations. On June 22, 1900, he received an order, with a reference to Messrs. Harvey Bros. He received an answer from that firm "that they always met their engagements." He sent the goods ordered, but never obtained the money.—After a number of other witnesses had given evidence, the prisoners were remanded.

DIRECTORS of a Company and their Authority to Discharge a Servant.—At Brompton County Court, on the 11th inst., before Deputy Judge Clement Lloyd, Mr. William Grass, photographer's engraver, 41, Seagrave-road, West Kensington, W., claimed £2 10s. 6d. from the Art Photographic Company, Ltd., 146, Strand, W.C., and Willesden Green, N.W., the claim being for a week's salary (£2) in lieu of notice, and 10s. 6d., said to have been wrongly deducted from plaintiff's salary.—The Plaintiff stated that he had been in the service of the defendant company for about three years. In October last he was accused of having injured the silk hat of one of the travellers, and for this Mr. Herbst, who appeared to be chairman of the board of directors of the company, deducted half-a-guinea, and subsequently discharged him without notice.—The Judge: Who are you now suing?—Plaintiff: The company.—Who engaged you? Mr. Reicht, the managing director of the company.—Who paid you your wages? Mr. Reicht; but Mr. Herbst appeared to have something to do with it.—For the defence, Mr. Theodore Reicht said that he was managing director of the company. It was the company who paid the plaintiff his wages, but the money was sent to the works by him (witness). Grass was dismissed by Mr. Herbst.—Mr. Charles Steinheter, a traveller in the service of the defendant company, stated that, while he was conversing with the manager at the works, balls of wool and paper saturated with water were thrown at him, and in this way his silk hat was spoilt. The balls came from the dark room, and on rushing to the door and looking in, he found the plaintiff busily washing his hands in a very suspicious manner. He had no doubt whatever that it was Grass who threw the balls.—Mr. Herbst said that he was chairman and general director of the defendant company. Both Mr. Reicht and he had power to dismiss a servant of the company. The witness added that Grass had admitted at Bow-street Police Court that he threw the balls, and was bound over to keep the peace for three months.—The Judge (to Mr. Reicht): Had Mr. Herbst power to dismiss this man?—Mr. Reicht gave no answer to the question.—The Judge (to Mr. Herbst): You say that you had power to dismiss the man?—Mr. Herbst: Yes, with Mr. Reicht's consent.—The Judge (to Mr. Reicht): Did you agree that he should be dismissed?—Mr. Reicht: Yes, I said that I should dismiss him. I agreed to his being dismissed.—The Judge: I find for the defendants.

RE William Patterson Whitebrook, Photographic Dealer, Ireton House, Highgate, N. (trading as W. Patterson).—The first meeting of the creditors concerned under this failure took place at the London Bankruptcy Court on the 9th inst., before Mr. Pope, Assistant Official Receiver. It appeared that the debtor had carried on business at his private address as a photo dealer, by advertising in the trade papers and selling on easy terms. He commenced business in 1897, and the receiving order was made against him on December 21 last. He had never kept stock, but had purchased goods as he wanted them. His failure had been caused through want of capital and to his expenditure having exceeded his income, also to bad debts. He had carried on business under the style of W. Patterson, and he did black-and-white sketches under the name of Whitebrook, as there was a prejudice against employing artists who were suspected of deriving any aid from photography. Latterly he had given up black-and-white work, owing to defective eyesight. The house in which he resided belonged to a Mrs. Gleadow, and the whole of the effects therein belonged to her. Mr. Gleadow died in 1898, and before his death debtor promised to look after his wife and eight children, if anything happened to him. He had since maintained them, and the expenses in connection therewith was the principal cause of his failure. His business had been brought to a standstill owing to want of means to carry it on.—In reply to the Official Receiver, Mr. Radford, solicitor, of Chancery-lane, E.C., stated that he appeared on behalf of the debtor, and had no offer of composition to submit to the creditors, but the debtor would do his best to find a purchaser for the goodwill of the business.—The Official Receiver said the creditors would be greatly obliged to the debtor if he would do so, as it would materially enhance the amount of assets.—Debtor said he had a purchaser in view, and he should do his utmost for the creditors so that they received as large a dividend as possible.—The Official Receiver further stated that Mr. Radford held a mortgage over the debtor's book debts for £151, but the book debts were only valued at £77, so that Mr. Radford would have to prove for the balance. There was another matter, however, that would require investigation, and that was, as Mr. Radford had not given notice to the debtors to the estate of the assignment of the debts, the assignment was bad in law, and that probably Mr. Radford would have to rank as a creditor for the full amount of his claim, and the book debts would be realised for the benefit of the general body of the creditors. He could not give a definite opinion on that until he had gone more fully into the matter.—Mr. Radford said the reason he did not give notice of the assignment to the book debtors was because he did not wish to prejudice the debtor's business, and, if the Official Receiver's contention was upheld, he would have to rank as an ordinary unsecured creditor.—The Official Receiver said the debtor had not yet completed his statement of affairs, but the liabilities were estimated at £409, and, if Mr. Radford's claim proved to be unsecured, it would raise the debts to £660.—The estate was then formally left in the hands of the Official Receiver for summary administration in the usual manner.

Patent News.

THE following applications for Patents were made between January 1 and 5, 1901:—

PRINT-WASHING.—No. 7. "Improvements in Machinery or Apparatus for Washing Photographic Prints and suchlike Articles. J. C. HARRISON.

PHOTO-MECHANICAL PRINTING.—No. 58. "New and Improved Photo-mechanical Methods and Means for Producing Curved Printing Plates and Rollers." T. W. HENRY.

CAMERAS.—No. 114. "Improvements in Photographic Cameras." F. H SANDERSON.

ENLARGER.—No. 297. "Photographic Enlarger." C. H. WATSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
21	Camera Club	Discussion and Exhibition of Photographic Novelties.
21	Derby	Demonstration: *Velox Paper.* Donald Nightingale.
21	Doncaster	*Enlarging by Artificial Light.* T. H. Connor, jun.
21	Glasgow and West of Scotland	*Birds'-nest Photography.* Harold Raeburn.
22	Birmingham Photo. Society	*Clouds.* C. T. Cox.
22	Newcastle-on-Tyne	Prize Slides.
22	Rotherham	Prize Slides.
22	Royal Photographic Society	*Imitative* versus *Creative.* W. Edwin Tindall, R.B.A.
22	Thornton Heath	Demonstration: *The Carbon Process.* W. C. H. Anson.
23	Ashton-under-Lyne	Demonstration: *Thornton Film.* Walter D. Welford.
23	Borough Polytechnic	*Ozotype.* John McIntosh.
23	Croydon Camera Club	*Warm Hues on Platinotype, and an Easy Way of Colouring Platinotypes.* W. H. Smith.
23	Redhill and District	*The Watkins Method of Timing Development.* John Sterry.
24	Camera Club	*Some Yorkshire Caves and Waterfalls.* T. C. Hepworth.
24	Darwen	Demonstration: *Trimming and Mounting.* "Grapho."
24	Hull	Prize Slides.
24	Leigh	Demonstration: *Secco Films.* Charles Binns.
24	Liverpool Amateur	Exhibition of Competition Prints.
24	London and Provincial	*Chemistry and Practice of the Bromide Process.* T. Thorne Baker.
24	Manchester Amateur	*Enlarged Negatives.* J. Wood Smith.
24	Woolwich Photo. Society	*A Trip to Holland with the South London Photographic Society.* W. Slater, F.R.R.S.
25	Aberdeen	*Retouching.* R. Glegg, B.Sc.
25	Bognor	Demonstration: *Trimming and Mounting.* Mr. Fisher.
25	Croydon Microscopical	Prize Slides.—*Hand-camera Work.* A. Horsley Hinton.
25, 26	Glasgow and West of Scotland	Judging of Exhibits by Members.
25	West London	Demonstration: *Thornton Film.* W. D. Welford.
26	Scarborough	Prize Slides.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 8,—Ordinary Meeting,—Mr. Thomas R. Dallmeyer, F.R.A.S. (President), in the chair.

BUSINESS.

The certificates of twelve candidates for membership were read, and eight candidates were elected members of the Society.

Two Societies were announced as admitted to affiliation, viz.:—Derby School Photographic Society, East Kent Natural History and Photographic Society.

The President reported the admission of the following members as Fellows of the Society:—Dr. John Wilbur Bartlett (New York), and Messrs. W. E. Bond, Chas. P. Butler, A.R.C.S., Thomas E. J. Stephenson, Alex. A. K. Tallent, and John Watson.

Nine members were nominated and elected scrutineers of the ballot for officers and Council, shortly taking place.

PROGRESS MEDAL.

The President announced that at its meeting, just previously held, the Council of the Society had awarded to Dr. R. L. Maddox the silver progress medal, in consideration of his valuable work in the introduction of the silver bromide gelatine dry plate, which has done so much to revolutionise photography in many aspects.

Mr. C. H. Bothamley read a paper on "Some New Methods of Intensification." The paper did not deal with any new methods which the author proposed to introduce, but compared the results given by several of the newer intensifying and reducing agents, namely, persulphate of ammonium reducer, Lumière's mercuric iodide and sulphite intensifier, agfa intensifier and reducer, cerium sulphate reducer, &c. A number of simple experiments were performed in order to arrive at the composition of the proprietary articles and to demonstrate the author's arguments. It was shown that the agfa intensifier contained a sulphocyanide and mercury. Without the lantern slides and test slips with graduated exposures, which had been cut and treated with the various preparations, it is not practicable to convey adequately the lecturer's conclusions. A lengthy discussion ensued Mr. Chapman Jones, Mr. F. T. Beeson, Mr. A. Mackie, and General Waterhouse taking part.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 10,—Mr. P. Everitt in the chair.

Mr. J. E. Hodd brought down a camera of novel action, this evening being intended for the display of apparatus of such a character. The camera had the American type of front, but was not intended for use with dark slides. It had a magazine for 5 × 4 plates, of which eighteen could be carried. The changing is effected by pulling out the inner chamber from the back and pushing it in again. An indicator is actuated by the same process, and nothing on the face of it is likely to go wrong. Mr. Hodd also showed the hand-camera tele-photo lens of Bausch and Lomb, for photographing distant objects without a long bellows to the camera. The tele-photo attachment is a negative lens, and is applied by removing the ordinary lens of the camera just described, screwing the tele-photo lens in its place, and attaching the ordinary lens in front of the tele-photo lens. No extra length of bellows is required. A magnification up to 2½ diameters is practicable, and up to four diameters with additional bellows extension.

Mr. Kindon showed a flash-light apparatus, consuming a special mixture, which is fired by means of a percussion cap. It was a small device, to be held in the hand, or it may be attached to the ground with a gimlet and fired by means of a cord. For groups or extended subjects an extension is provided. The mixture was non-explosive, and supposed to be smokeless. Very little smoke was given off.

Mr. E. T. Wright showed and set up an old folding camera stand, not quite the thing now employed, but very rigid and serviceable.

The Chairman referred to his previous words on the subject of optical flats as a test for truth of surfaces. The test was that straight bands of prismatic colours should be visible between the two surfaces. He thought it might be interesting to examine a colour screen sent out as optically worked. If the surfaces were properly worked, the straight bands of colour should be visible, as between the two flats he had previously shown. It was seen that the bands of colour were very far from straight. It was a matter of importance that these colour screens, if sold as optically worked, should be so. At the usual price it might not be possible to do it, but in the ordinary way it was impossible to detect the error, and the mischief remained.

Mr. A. Mackie related some experiments that he had made after hearing Mr. Bothamley's demonstration at the Royal Photographic Society the previous Tuesday. It was shown that agfa intensifier contained a sulphocyanide and mercury. He had made up a strong solution containing these ingredients, and found considerable intensification took place. Diluted, the solution seemed to act fairly well. His experiments with the home-made mercuric iodide and sulphite intensifier were also described, but have been before alluded to. This intensifier differs from Edwards's intensifier in the substitution of sulphite of soda for the hyposulphite. Lumière found, as did others, that the hyposulphite gave results wanting in permanence, and there was no doubt that the sulphite was an improvement. The intensified negative should be redeveloped, however, and then would be practically permanent.

Mr. S. H. Fry said the advantage of Edwards's intensifier was that, if by inadvertence one went too far with it, the excess could be reduced. Was this possible in the same way with hypo if sulphite were used?

Further discussion ensued on this point, and it was suggested that, if hypo would not, something else might be found that was suitable. Questions, intended to discover which was the best intensifier and reducer of the newer arrivals, were also put, but no definite assertions were offered.

The Chairman stated that on a recent foggy day (Sunday, December 23), about 2 p.m., he had taken an Ilford special rapid plate in a slide, and opened and closed the shutter half way in the road outside his house. The following day, in a fair light, he took a portrait on it, but on developing the plate no fog or line of demarcation appeared, testifying in rather a surprising way to the lack of actinic value in the light.

PHOTOGRAPHIC CLUB.

JANUARY 9,—Mr. A. Mackie in the chair.

Mr. F. A. Bridge briefly announced the recent death of Mr. Ayres, one of the early members of the Club, at the age of 81. He recounted several interesting episodes in which the late Mr. Ayres took part. The deceased member was liked by all, and was a great authority on printing with albumenised paper.—It was unanimously agreed to send a message of condolence to the daughter of the deceased gentleman.

Some mention having been made of methods of reduction, one member saying that a certain proprietary article had failed in three hours to have any effect upon a pyro-soda negative, the Chairman alluded to a similar difficulty, which was ultimately found due to the negative having been varnished. Methods of varnishing were then touched upon.

Mr. E. W. Foxlee said that the Bedfords used to coat their negatives with collodion before varnishing them.

Mr. Bridge stated that Ashman, of Bath, used a varnish made of gold size and turpentine. Its drawback was the long time required for drying.

The Chairman believed that gold size did not long remain colourless, and therefore might not be suitable for a varnish.

Mr. Foxlee added that, if bought at oil shops, it was an unreliable and inconstant material.

Mr. Brown held that brown lac varnish made from button lac took a lot of beating, but very few people, he believed, now varnished their negatives.

The Chairman said that better varnish could be made at home than could be bought anywhere.

A question was received asking whether the number of prints tonable with a given quantity of bath varied with the nature of the bath—borax, acetate, and so forth. In other words, was one bath more economical of gold than another?

It was asserted that a borax bath did not require so much gold as did a sulphocyanide bath.

The Chairman said that in the "albumen" days there was a theory erroneously held that different baths gave different tints, and formulæ were given for warm tones and others for black tones, and so on. There was no real foundation for this. Different baths were adapted to different degrees of toning. It depended not so much on what was in the bath, but upon the state of the bath at the time of use.

Mr. Foxlee said that he thought it was a fact that different baths gave different tones, apart from the question of gold consumption. He instanced the differences between the acetate bath tones and those of the old chlorinated lime bath and the carbonate of soda bath. He believed that, on the whole, the acetate bath was the cheapest bath, inasmuch as it kept well, and gold could be added again and again.

The Chairman said that his practice was to make his bath fairly concentrated to start with, the yellowness of the gold being plainly visible. Whilst the slightest colour was visible in a toning bath it was not fit to use; a bath ready for work had a slight bluish tint.

Further discussion ensued regarding the peculiarities of paper salted and sensitised in various ways, the permanence of old albumen prints, and the keeping of paper and plates.

West London Photographic Society.—On the 11th inst., Mr. H. R. Procter read a paper on "The Newer Developers," and showed a number of negatives produced by ortol, kachin, imogen-sulphite, adurol, &c., as well as others which had been developed and fixed simultaneously with kachin and hypo. He could confidently recommend any of the above agents, and the combined developer and fixer was specially useful in cases of known over-exposure. In a discussion which followed, various members spoke well of ortol and kachin, whilst the Secretary expressed a preference for hydramine.

Thornton Heath Polytechnic Photographic Society.—January 8,—Second Annual General Meeting.—A most satisfactory report was submitted, showing an increased number of members and a substantial cash balance. The Executive for the ensuing year were elected as follows:—President, Dr. C. Owen Fowler; Hon. Treasurer, T. Ironmonger; Hon. Secretary, W. Burwell Smith; Committee, Mrs. C. A. Bynoe, Messrs. W. C. H. Anson, G. F. Course, B. E. Edwards, A. Gaymer, W. G. Langridge, P. Putnam, J. H. Robertson, and W. H. Rogers.

Southsea Amateur Photographic Society.—The Annual Exhibition of this Society is to be held on January 29, 30, and 31, and exhibitors are reminded that the last day for sending in work is the 24th inst. All particulars and entry forms can be obtained from the Hon. Secretary, Gilbert Wood, 10, Pelham-road, Southsea.

Birmingham Photographic Society.—January 8, 1901. A demonstration was given by Mr. Ames, representing Messrs. B. J. Edwards and Co. The subjects were the firm's "Kristal Lantern Plates," and the values of isochromatic plates over ordinary, both with and without a screen. Dealing first with the Kristal lantern plates, the lecturer demonstrated the methods of exposure, advising that the best results were obtained by using magnesium ribbon. Mr. Ames then proceeded to expose and develop some plates, the results showing that a very considerable latitude in exposure was allowable and that a very extensive range of colour from cold black to warm purple was easily obtainable, and that, further, the results with a uniform exposure and developer were practically the same, enabling the amateur to be certain of a greater uniformity than has hitherto been considered possible. With 1 in. magnesium ribbon burnt at a distance of 15 inches from the plate, which was developed with equal parts of developer and water, cold black tones were obtained. With three inches of ribbon, at 15 inches distant from the plate, and a developer of one part to three parts water, a warm sepia tone resulted. To obtain red tones the exposure must be increased three or four times and the developer diluted eight times. For purple tones a developer especially prepared by the firm must be employed. The still wet plates were then passed through the Society's lantern, and the results were much admired, and, what is more to the point, they equalled in beauty the exhibition slides brought by the lecturer. Sets of slides demonstrating the value of isochromatic plates were then thrown on the screen, and thus concluded one of the most successful demonstrations given under the Society's auspices.

Leeds Photographic Society.—The Annual General Meeting of the above Society was held on Wednesday evening, the 9th inst., at the Philosophical Hall. Mr. Godfrey Bingley, the retiring President, occupied the chair. The report and balance-sheet was submitted and adopted, and the following gentlemen were elected the officers and committee for the ensuing year:—President, Mr. J. W. Addyman, B.A.; Vice-Presidents, Mr. Godfrey Bingley and Mr. J. Croisdale Coultas; Hon. Secretary, Mr. Robert Mackay, 69, Albion-street, Leeds; Hon. Treasurer, Mr. T. Carter; Hon. Lanternist, Mr. A. W. Atkinson; Hon. Librarian, Mr. A. Nicholson; Committee, Messrs. B. A. Burrell, F.I.C., A. C. Bielby, B. T. Akers, R. Stockdale, M.A., and F. G. Harmer.

FORTHCOMING EXHIBITIONS.

1901.

January 18, 19..... Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

February 16–March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.

February 20–27 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath, S E.

March 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

A CHANGE FOR THE BETTER.

To the EDITORS.

GENTLEMEN,—Two or three years ago, I wrote you explaining my position, and asked your advice as to what salary I was worth. Your reply was that I could easily command £2 2s. per week. Since then I have opened a studio here, thinking there might be a good opening for me. There is a population of 28,000, and I am the only photographer. My takings for my first year, ending October 9, 1900, were £210, and from then to date £80, making £290 for the fifteen months I have been opened. Average, £4 16s. 8d. per week. Have I taken a step for the better? Ought I to be fairly content, or do you think I should be doing more with 28,000? You must pardon me troubling you with this, but I am an anxious worker. I am young (23 years), but fairly well up with my work (in your opinion also). I enclose price list, that you might see my rate of charges.—I am, yours, &c.,

ANXIOUS.

[We are very pleased to have our correspondent's letter. Let him persevere, and we have no doubt that in a year or two he will be meeting with marked success. EDS.]

REVERSAL IN ECLIPSE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I am much obliged by your referring to me Captain Forbes's letter and the enclosure.

I have really nothing to add to what I have said in my former letters, except that any censure which may apply to the title of the exhibition photograph does not do so here; the former purported to be the picture of an eclipse, the title of this is only a picture taken during an eclipse. Neither is a true representation of a partial eclipse, but this does not claim to be so; though untrue in part, it is, no doubt, an accurate print from the plate, and true as to the landscape. I assume that the title in large letters is meant to refer to some articles giving a general description of the visible phenomenon.

And now, Gentlemen, permit me to say that (so far as I am concerned) this matter must rest. I am no schoolmaster to teach elementary science. Any one can satisfy himself in a dozen different ways that the sun is really an intensely bright object on a comparatively dark background; any photographer can satisfy himself that, following the procedure described by Mr. Bremmer, will, even without an eclipse, give a negative from which a print will show a black sun on a bright ground. Of course, either result may be accepted as the truth; but the person who believes in the photograph differs so much from me in weighing evidence that discussion is useless.—I am, yours, &c., J. F. TENNANT (Lt.-Genl. R.E.).

11, Clifton-gardens, Maida-hill, W., January 11, 1901.

EIKONOGEN *V.* ORTOL.

To the EDITORS.

GENTLEMEN,—Mr. Welford's interesting letters praising Ortol induced me to procure some, and I found that my negatives had not sufficient density. My favourite developer is Eikonogen, with a little Quinol added; so I determined to compare the two developers.

I exposed four plates under precisely similar circumstances. Two I developed with the Eikonogen, and two with Ortol. The Ortol required the longer time, and even then the Eikonogen gave the best results, the negatives being admirable, whereas the Ortol plates were rather thin. The photos were views outside, and the exposure correct. The Ortol was the standard formula. I propose to adhere to Eikonogen.—I am, yours, &c.,

AMATEUR.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In part reply to Mr. Farmer (p. 815, December 21, 1900), I would say that in the trichromatic process, as applied to printing, when the prints are to be viewed in ordinary white light, it is necessary to do one of two things, *i.e.*, to either suffer some degradation of colour, or sacrifice something of the capacity for differentiating hues. It is easy to prove that a departure from the most approximately perfect theoretical method can be advantageously made with respect to certain colours, but the analysis of any such modified procedure will, I am sure, disclose a tendency towards the translation of an infinite variety of hues into a limited number. I have often heard early examples of trichromatic printing criticised on the score that they showed no variety of reds or greens, the reds being generally "brickey," and the greens crude and monotonous. Colour prints which I have made from kromskop negatives by gelatine printing have not been so criticised, and three-colour typographic prints from the same kind of negatives are particularly remarkable for the differentiation of hues. The first proofs from the blocks were distinctly "dingy," but when I had special printing inks made, which were perfectly transparent, and dried with a gloss, I obtained brilliant and remarkably accurate results.

Although Mr. Farmer bases his argument partly on the necessity for employing impure printing colours, his criticism, as stated, would condemn the kromskop negatives even for making gelatine prints; but it seems to me that the relative luminosity of greens and yellows should be, and is, preserved in such colour prints, whether the colours be simple or compound. The lowering of the green analysis curve at the E line virtually adds black (i.e., reduces the green) in the kromskop synthesis just as truly as in the colour print, yet it is obviously necessary in order to reproduce the spectrum accurately, and it preserves the colour and luminosity values in the Kromskop reproductions from ordinary coloured objects as well. In short, it seems to me that the original analysis must always take into account the luminosity value as well as the hue of every part of the spectrum in order to preserve these values even in reproducing compound colours.

It is easier to argue this matter from the other end, because the development of the argument is then direct and logical, and brings one inevitably to the conclusion that, assuming certain colours as "primaries," and taking the luminosity values of the spectrum rays as we find them, only one correct trichromatic analysis is possible, and such analysis bears the same relation to synthesis whether by plus or minus colours.

If Mr. Farmer would publish his approved analysis curves, it might be possible to make some comparisons which would further elucidate the matter. My own opinion is that it could be shown mathematically that every gain was offset by a loss which, from my point of view, would be more important than the gain. On the other hand, an improvement might undoubtedly be shown from the point of view of the commercial trichromatic printer, who seeks with imperfect inks and printing, to ensure bright, catchy results, ignoring the more subtle qualities, which can only be obtained under the more critical conditions which I would seek to establish. I have myself regularly made and supplied screens adjusted for modified and sharper curves expressly to meet such requirements, when asked to do so.

It has been evident to me that, if we would confine our tests to a few bright, saturated pigment or dye colours, with very little gradation of hue, even imperfect printing inks could be made to reproduce them without material degradation, but that the method that would accomplish this would infallibly break down on very many subjects for which the process is really well adapted if properly carried out. Practical experience in the use of the two kinds of screens has confirmed my belief. I can add that one practical three-colour process operator, to whom I supplied both kinds of screens, on first trials approved the special screens and condemned the Maxwell curve screens. I then gave him some detailed instructions about printing inks and test subjects, and urged him to make further trials, with the result that in a few weeks he finally adopted the Maxwell curve screens, and returned the others to me.—I am, yours, &c, F. E. IVES.

SOMETHING FOR NOTHING.

To the EDITORS.

GENTLEMEN,—I had sent a photograph to the person whose name appears on the enclosed post-card, stating that I should be willing for it to be reproduced with an article he was writing in one of the leading magazines if my name appeared as photographer and the usual fee paid. The photograph was sent by his request. This reply, after the receipt of the photograph, seems to be so beautifully expressed I thought you might be interested in seeing it.—I am, yours, &c.,

H. BIRD.

6 and 7, St. John-street, Stamford.

[We append a copy of this "prudent" author's post-card: "What is your fee if I use the photo? Several photographers are allowing their

productions to be produced free of fee, taking it a compliment to be addressed as 'the chief photographer.' In cases where men are asking for fees, not content with the advertisement of their names appearing, I am endeavouring, prudently, to obtain the productions of amateurs." We wonder if this frugal literary gentleman would be agreeable to supply editors and others with magazine articles, written gratis, in return for empty compliments and barren advertisements. EDS. *B.J.P.*]

A WAGES QUESTION.

To the EDITORS.

GENTLEMEN,—I notice Mr. Randall says, "Obviously, 'Comyn' is not overpaid, since no large firm in the City is run as a benevolent institution for the benefit of employeés." I venture to think personally, that, according to the present rate of wages, he is overpaid—providing his remarks as to his abilities, or rather the work he is called upon to do, gives a fair idea of things. It would be extremely acceptable if one-half of those who could do the same work as "Comyn" could get such a sum for their services. They certainly cannot, and that is why I must beg to differ from our esteemed friend, Mr. Randall. It would also be of interest to know what is being "overpaid." Upon what are we to form our conclusions? The present rate of wages, or any one particular firm? In conclusion, I would ask, "What is the present rate of wage for the class of work spoken of?" Leading firms may pay higher wages, but I cannot help thinking that for the work done—"ordinary work," as "Comyn" says—the wage is much above the present rate, and that to be contented with his lot is the wisest plan. I therefore agree with our Editor's remark—"Not to relinquish his present engagement."—I am, yours, &c., G. W.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

E. & E. Pickering, The Studio, Lavant-street, Petersfield.—*Photograph of the Hon. Mrs. A. Lyttleton.*

G. Milne, 45, High-street, Turriff.—*Two photographs of A. Stuart, Esq. Two photographs of Rev. L. M. Watt.*

F. J. MARTIN.—Consult a solicitor, who might advise you that it was a case of illegal possession, and would recommend proceedings.

ADDRESS WANTED.—J. JOHNSON writes: "Would you be kind enough to send me the address of your contemporary, the "Photographische Chronik?"—In reply: The address is Wilhelm Knapp, Halle-a-S.

ACETATE OF SODA TONING BATH.—T. BROWING asks for the formulæ for the acetate toning bath for albumen prints? It is acetate of soda 30 grains, and chloride of gold 1 grain, to 8 or 9 ounces of water. It should be made up twenty-four hours or so before it is used. The usual four ounces of hyposulphite of soda to the pint of water is the proper fixing bath.

A CAMERA QUERY.—"AUTOCAM" writes: "Re the Helioder camera, by Herr A. O. Festerling, notified in your JOURNAL March last, where can I get particulars? Are the machines on sale, what size are the pictures, and how long does it take to take and finish them?"—In reply: We have looked through the JOURNAL of March last, and can find no reference to the camera named. Will our correspondent be a little more explicit?

COPYRIGHT.—"X. Y. Z." writes: "Will you kindly tell me the course to pursue in the following case:—An unregistered photo ("copyright reserved" stamped on the back) is submitted to an illustrated paper, which publishes it and pays the ordinary fee. Subsequently the paper publishes the same photo in later issues, but refuses to pay further fees or to discontinue publication of photo."—In reply: It is doubtful if you have a remedy. Registration is essential to secure copyright, and unless that formality has been complied with piratically-inclined newspapers have the whip hand of you.

ARTIFICIAL LIGHT PORTRAITURE.—ARTHUR JONES asks: "1. Could you tell me if there is a book published on 'Portraiture by the electric light,' and, if so, by whom? 2. Also, which is better for portraiture, the arc light or the incandescent; also, what candle-power do you most recommend?"—In reply: 1. We know of no book specially devoted to the subject. 2. Probably the former. In order that your exposures may be sufficiently shortened, a candle power of about 10,000 will be necessary.

A SMASHED NEGATIVE.—"G. I. P." writes: "I gave a photographer a negative to have some prints taken off. He smashed it, and declines to give compensation. I prized the negative very much, as it was the best ever I had taken. What do you think would be a fair value to sue him for? Do you know of any similar case?"—In reply: We cannot recall such a case. All depends whether the photographer disclaims responsibility for breakages. In the absence of particulars we suggest that a claim for a few shillings would meet the case.

ROYAL WARRANTS.—"E. G." writes: "Would you kindly enlighten me as to what is the formality for obtaining the Royal warrant (the privilege of using the Crown, or Royal Coat-of-Arms on mounts, &c.) Would it be a sufficient qualification, having executed a commission for a member of the Royal Family, to make the application?"—In reply: As to the last question, we think not. But let our correspondent address a letter to the Comptroller of the Royal personage for whom he executed the commission, and he will learn what chance he has of securing the coveted Warrant.

DIRECT POSITIVES.—"MIDGET" writes: "1. Some short time ago I saw a reference (I think in THE BRITISH JOURNAL OF PHOTOGRAPHY) respecting a paper that was to be put on the market for making positive pictures direct. I think the firm was Thornton and Rothwell, Manchester. Can you kindly give me any particulars or direct me where I may obtain them? 2. Can you inform me of any paper, like THE BRITISH JOURNAL OF PHOTOGRAPHY, published in America, in which I could advertise for miscellaneous wants?"—In reply: 1. Address the Thornton Film Company Altrincham, Cheshire. 2. There is no such paper; but perhaps "Wilson's Photographic Magazine," published in New York, comes nearest to your ideas.

STUDIO GLAZING.—F. OLIVER writes: "Will you kindly give an opinion as to which would be the best glass for glazing a studio? The studio has a good north light, but is rather overlooked by windows, so I want a glass that will not stop out light and yet cannot be seen through. I saw your answer to similar inquiry a week or two ago, but am not sure what sort of glass you mean by white fluted. I suppose ground or rough-rolled would stop more light."—In reply: The sample labelled "18—W. A. and S." is what we had in our mind when answering a previous correspondent, but the "19 W. A. and S." would answer quite as well. The small piece not labelled would do very well, but we fancy it would be more trouble to keep clean than either of the others.

LINE DRAWINGS FROM PHOTOGRAPHS.—"W. H. W." asks: "1. If it is possible to go over the outline of a portrait (say, a P.O.P.) with a certain pencil or ink, and then lay it in some chemical, I believe iodine and pot. cy., which will dissolve away the portrait and leave the outline standing, which could be utilised for a line block? 2. What paper and ink can I use for tracing, say, a line drawing, which I can afterwards transfer to a zinc plate direct? 3. Can you inform me where I could get any books relating to the above subjects?"—In reply: 1. Yes. Trace the outline over with lithographic chalk and then bleach the photograph in a solution of bichloride of mercury. 2. Litho transfer paper and litho writing ink. Suitable inks for the purpose are supplied by Messrs. Penrose and Co., Upper Baker-street, W.C. 3. The firm just named supply all works that have been published on the subject. Write for their catalogue, which includes them.

SMASHED NEGATIVES.—"COPYRIGHT J." writes: "In 1893 I took a negative and copyrighted it. I broke up home here a year last March, and left for the South Coast, and before leaving a local photographer asked me if I had any negatives that would be useful to him. I sold him four or five half-plate negatives of views, which would be useful to him for opalines. He then asked me if I had any more, and I said yes, but not on sale, as they could never be replaced. I let him have the use of them for a small consideration of 3s. for three negatives, but with the understanding that they were still mine and he would keep them safe for me until I needed them. I have now returned, and want them, one especially, the copyright one. I may say he sent me the 3s. to the South Coast, and I forwarded them, but they got smashed to atoms in transit, but, luckily, I had duplicates, and at once sent those. He now refuses to let me have the copyright negative, and I have nothing to show in writing. But I have not transferred the copyright to him in any shape or form. Will you kindly tell me my position and what to do?"—In reply: We are not sure if this case would be covered by the Copyright Act. Probably a threat of a summons for illegal detention of the negative would have the effect of securing its return.

*** We have again to hold over many answers to correspondents, reviews, notices of apparatus, and other matter. All arrears shall be overtaken in our next; meanwhile we ask the indulgence of our readers.

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EX CATHEDRÂ.

A Great Patroness of Photography.

The death of Her Majesty, Queen Victoria, takes from us one who had been a steadfast patroness of photography during the past 60 years. It is difficult to exaggerate the beneficial influence upon an art born, so to speak, within her great and lengthy reign, which the late Queen's patronage of photography must have had; without her constant countenance and support, and the unceasing favour of the other members of her House, we may safely conjecture that photography would occupy a far lower place in popular esteem than it at present does. Photographers, like every other class of the community, will mourn the end of one of the most illustrious lives the world has seen; and the share of many of them in the national sorrow will be intensified by the knowledge that they were often brought into intimate personal association with the august Sovereign. Her Majesty, it may be mentioned, was Patroness of the Royal Photographic Society.

The R.P.S. Progress Medal.

The recent award of the Royal Photographic Society's Progress Medal to Dr. R. L. Maddox for his "work in the introduction of the silver bromide dry plate" is a reminder that the recognition in question has reached this veteran worker somewhat tardily. It is nearly a third of a century ago—to be precise, on September 8, 1871—that Dr. Maddox published in The British Journal of Photography "the first real attempt on record to compound a practically workable gelatino-bromide emulsion." This was the description applied to the Maddox formula 21 years ago by the late W. B. Bolton, then Editor of this Journal, and at the same time one of the highest living authorities on gelatine-emulsion photography. In these days we should look with some curiosity at a dry plate containing free silver, free nitric acid, and nitrate of sodium, but this was the condition of the Maddox plates if prepared according to the author's formula. In his experiments transparencies from negatives were made, plain pyro development, followed by pyro-silver intensification, being resorted to. We believe that these transparencies were for years objects of interest in the old York-street office of the Journal, when the late Mr. Traill Taylor was Editor. The direct influence of Dr. Maddox's experiments on the growth of gelatine-emulsion photography is not easy to trace, but modern historians do not hesitate to credit him with being the first to attempt to use gelatine as a vehicle for the sensitive salts—experimentally and practically. Alike as a master of the microscope, especially in its photographic applications, as well as for his gelatine emulsion experiments, Dr. Maddox is worthily entitled to the honour just paid to him, and upon which, in his retirement, we desire to heartily congratulate him.

* * *

Pigmentary Colour Photography.

Nearly fourteen years ago we printed in The British Journal of Photography two papers by the late Mr. Carey Lea, in the course of which he detailed a number of experiments on red silver chloride, a substance which, in his opinion, was destined in some form or other to lead eventually to the reproduction of natural colours. In the Almanac of 1899, and subsequently, we made references to Carey Lea's experi-

ments, with which it appears, from what we have recently discovered, many modern photographers interested in colour work are not acquainted. It has occurred to us that it may be of general interest if we reprint Carey Lea's valuable papers, which we propose doing in the JOURNAL next week. The experiments described in the papers are of a simple character, and may be repeated with great ease. Carey Lea's work excited much interest at the time his papers were published, but the great attention shortly after given to the Ives' system of trichromatics somewhat obscured his suggestion that the natural colour problem might possibly be solved by pigmentary means. Unlike many others who have taken up colour work, Carey Lea was no mere empiric—the pages of this JOURNAL for over 20 years bear witness to the fact that he was perfectly sound in photographic theory and practice, and made many useful additions to our knowledge. His "Manual" was at one time a standard book.

* * *

The Photographers' League, U.S.A. American photographic magazines reach us in such great numbers that we find it a difficult matter to keep pace with their contents. One of the most original of them, and the youngest in point of idea, has lain at our elbow for weeks, awaiting particular reference. It is the December number of the official organ of the Photographers' League, an incorporated body, with headquarters at New York. The League claims to be the largest body of photographers in the world, and its principal object is to enable members to buy photographic goods at wholesale prices, without the intervention of middlemen. We gather that the League looks forward to the time when it can control its own source of supply of everything photographic; at present it claims to be known in every photographic corner of the United States. The subscription is one dollar a year; for 25 cents a League badge or pin is issued, and, besides the great advantage of dispensing with the middleman's profit, there are others of a minor kind which are, nevertheless, decidedly worth having—such as a library, display albums, exchange and sale lists, an information bureau. On paper the League looks a businesslike affair, but it strikes us as strange that outside the pages of its own organ it does not receive much, if any, press notice.

* * *

What the League has done. But, judging the League by its performances, it must be a powerful, as well as a numerous, body. Here are two extracts from the official publication, which, granting their accuracy (and there is no reason for doubting it), amply prove that the League is by no means useless as an offensive, as well as a defensive, organisation:—"We note that Mr. W. F. Carlton, who was at the head of the camera combination, has stepped down and out. Surely this should be an object-lesson to would-be sole controllers of things photographic. Mr. Carlton has been associated with things photographic for about eighteen years. He is one of the very nicest of men. He is the victim of a big mistake. When he put a restrictive price on Premos his sales dropped off, and Pocos owned the field. When he formed a camera combine, the business done by outsiders must have surprised him. Finally he quit. He should be glad to be free from the responsibilities which must weigh heavily on his successors. He was too good a man to be head of a trust. The dry-plate combination has also gone to pieces, and everything we prophesied has come to pass. The dealer loses money on the stock on his shelves on December 1; the amateur lost money on his purchases prior to that date. The combination of manufacturers probably found that their increased profits on the plates sold were more than offset by the falling off of sales. Truly the League is the best thing, and our existence, objects, and methods find ample justification. Some people seem to think that we are straining a point when we attribute the recent disturbances among the trust magnates to our own efforts. Those people are not aware of the extent of our power. There are others who will soon be made acquainted with it. We predict a smash in prices of papers. Verbum sap." Now, to have defeated both a camera combine and a dry-plate combination in the States, the home of trusts, is no mean achievement for a mere association of photographers. The League, it will be observed, is flushed with victory, boasts of its power, and brusquely predicts a smash in prices of papers. We shall see. Meantime, we should like to know a little more of this Mighty League, the like of which does not exist in poor old Britain.

* * *

Cheap Platinum. A series of experiments is being carried out by the Post Office telegraph officials with the object of discovering whether platinum forms a good substitute for copper in telegraph and telephone wires. The ultimate decision is that platinum wire is not to be used "unless some means can be found to toughen it." Among the factors employed to aid in arriving at a decision, we read, is one to the effect that "platinum costs £130 a ton, while copper only costs £80 to £90 a ton!" Such a price is enough to make the photographic mouth water, seeing that sixty or seventy thousand pounds would be more like an average value per ton for the raw material of the platinotype process. It is, of course, easy enough to see what ought to have been written; it is obvious that metallic aluminium, and not platinum, was being experimented upon. It too often happens that scientific matters are treated by the daily press in such fashion as this; if their Editors would have a scientific press censor, it would be as beneficial to the readers as to the reputation of the papers. It is not long since the same mistake was made with regard to nails for soldiers' shoes, which we were gravely informed would, when made of platinum, be better in every way—much lighter, better wearing, and cheaper in the end!

* *

Action of Light. The need for close discrimination of all attendant phenomena when discussing the results of light action is instructively shown in an article by Dr. T. L. Phipson in last week's "Chemical News." He states that it has been known for some time that when spring water, rain water, and river water are exposed to sunlight, or even diffused daylight for a sufficient length of time in summer, the gradual development of what has been termed the "green matter" of Priestley occurs. Dr. Phipson has shown, however, that the source of this green matter is not the water itself, but the atmosphere whence the first fall of snow will bring them down abundantly. This is readily shown by first boiling the water in a flask, and filling up the neck with a plug of cotton-wool. Months of sunlight then have no effect. When sugar has been added to water (.3 per cent.) in a plugged flask no green matter, but a similarly constituted white matter, is produced in sunlight. Then, if the sugar solution, added to the water, is sterilised,

the formation still takes place; but, if the water be boiled before adding the sugar, the white substance is not formed, thus showing, as Dr. Phipson states, that the germs are in the water, and not the sugar, and the first-described experiments prove them to have arrived there from the air.

THE EVOLUTION OF THE CAMERA.

The first camera was a dark room. This may sound a trifle paradoxical, but is simply the statement of an undoubted fact; the Latin name, itself, of the prototype of our indispensable piece of photographic apparatus—camera obscura, i.e., dark chamber—amply bears out the contention.

To begin with, far back in the mists of antiquity, some man of a more inquiring mind than his fellows must have noticed that, if you have a tiny hole in the wall of your room, and it happens to be light outside and dark within, a small reversed image of the view without is sometimes thrown on the wall opposite. This man with the inquiring mind must have handed down the fact, until others more scientific, if not so observant, found out that the image was much brighter and more distinct when a convex lens was used instead of a hole, with a slightly curved white screen to receive the image. The next advance was in the direction of portability. Rooms are not very handy to carry about, and people got tired of having only one view to look at, so in 1569 the first portable camera obscura revealed itself to an approving world. The honour of this invention rests with Giambattista della Porta, of Padua, an erudite experimental philosopher in his day, whose memory should certainly be held in veneration by photographers, for where would Nièpce and Daguerre have found themselves without their "dark box?"

The box form of camera obscura had a long and successful run of popularity, under slightly varying forms, for nearly three centuries, before the discovery of the photographic action of light gave it an importance before undreamed of. The Abbé Nollet mentions the apparatus in his "Lecons de Physique," published at Paris in 1755, while a form of camera obscura which met with much favour for outdoor work in tracing landscapes, being especially designed for this purpose by M. Guyot, is described in an old work published in 1774, entitled "Rational Recreations." It much resembles an ordinary table, the camera being placed underneath, between the legs, and the image reflected upward by an inclined mirror on to a screen of plain glass, which forms the top of the table, and upon which it is stated a piece of tracing paper was laid, when the view might be either admired only, or traced with a pencil and drawn. How little they thought, those early dilettanti, that these same views would one day be drawn by a quicker pencil than theirs! One cannot help admiring the graceful outline of the legs, as illustrated in the curious plate accompanying the text of this long-forgotten book, though whether latter-day camerists would care to take them in exchange for their feather-weight folding tripods is doubtful. The thing must have been rather cumbersome to carry, but then there was not quite so much going to and fro in those days, and probably only those who had their carriage to carry it in could afford to have anything to do with it. One thing that may be noticed is the way in which a reversed image was avoided, a thing which we often vainly long for in our modern cameras.

The first use of the camera obscura for purely photographic purposes was when Davy, following up Wedgwood's experiments, tried by its means to obtain pictures on paper sensitised with silver nitrate. His success was not overwhelming, as may be easily imagined. The apparatus used by Nièpce and Daguerre in their earlier experiments was essentially the same as the primitive box form of camera obscura, and, at first, admitted of no possibility of focussing, being of what one might call "fixed focus." They did not admire "fuzzygraphs" at that time, however, so the lens was speedily provided with a telescopic action, and Daguerre's later cameras had, in addition, their body made in two parts, one sliding within the other, and clamped together by a screw at the bottom. Now and then we come across a surviving specimen of this arrangement on the beach at the seaside, or at street corners in town, dilapidated and shorn of all its former glory, serving to take cheap ferrotypes for those who will have them. These early cameras were provided with a slanting mirror at the back, the angle of which could be adjusted by a cord, and which served to show the image right side up, and more brilliantly, for the ground glass of the period was not remarkable for transparency. At first there was no separate focussing screen like we have at present, but a piece of ground glass, the same size as the plate, was inserted in the dark slide, which was used as a frame for it, with its shutter drawn and door at back open. After focussing, the slide was removed to the dark room or tent, and, the ground glass being replaced by a plate, all was then ready for reinsertion in the camera, and subsequent exposure. Undoubtedly, the plan was rather tiresome, but, at least, had the advantage that the image on the plate was always exactly identical with that on the screen, as regards sharpness, extent, and position.

We, with our light and portable apparatus, can scarcely realise how bulky and heavy was that which our predecessors had to carry. The early cameras might have been intended to be handed down as heirlooms through the centuries, so solidly were they put together, of the toughest and weightiest mahogany, with solid brass fittings of appalling thickness. The first revolt against this order of things was when Ottewill devised a folding camera, a rather complicated structure, which, however, enjoyed at the time much popularity. A better arrangement, though still of unnecessarily worrying complexity, as looked at by our modern eyes, was made by Mr. George Edwards in 1853, and obtained for its inventor the medal of the Society of Arts. Roughly speaking, it consisted of a rod, acting as baseboard, along which slid the front and back, both being capable of folding; while the body proper of the camera was a light-tight bag, containing the necessary apertures for the lens, and for focussing, which when in use went over all. There were, however, an annoying number of hinges and screws about this arrangement, and, as might have been expected, they proved too much for the limited amount of patience possessed by the photographers of the day. One loose screw is enough to be bothered with, that, namely, pertaining to the tripod, which, as we all know, has peculiarly nomadic habits—so Edwards's creation went back again into obscurity.

Those were the days of the wet plate, which had to be developed directly after exposure, and before it became dry. That being so, it is not surprising that various devices were mooted for using the camera itself as a developing chamber. Scott Archer is said to have used some such contrivance,

while Mr. Newton in 1852 designed a camera carrying troughs of solution for immediate development after exposure. The advent of dry plates, however, put an end to all these more or less laudable inventions, adding also to the camera's length of life, for the chemicals used in sensitising the plate had a terribly rotting and deleterious effect on the woodwork and slides.

The next step forward was in 1854, when Captain Fowkes, R.E., introduced the bellows body. It is always interesting to trace inventions and improvements to their origin; in this case, probably, it was the then highly popular accordion which suggested the idea to the gallant officer. The first bellows were square in form, the tapering variety being of later introduction. This great advance in the direction of portability would seem to have been the chief move onward toward the camera as it stands at present, for after this one improvement rapidly followed another, being now, however, more the ideas of rival manufacturers than those of isolated inventors. The swing back, the rising front, horizontal movement for lens, reversing back, double dark slides, changing boxes, and many another modern acquisition, were all developments that might fairly have been anticipated as a necessary consequence of better acquaintance with the purely mechanical drawbacks of the older cameras, combined with the rising standard of photographic requirements. It is quite amusing now to reflect how the primitive camera had to be turned over on its side to secure a picture "view-ways;" also, when looking at some of our more ancient photographs, to realise the calm contempt that early workers had for vertical lines in architectural subjects, not having then at their command the means of easily ensuring them. How they would have marvelled at our legion of hand cameras, too, of multitudinous and varied pattern, from the half-crown toy of the schoolboy to the latest elaborate product of optical skill and ingenuity!

The improvement in lenses, which, after all, are the most important adjuncts of the camera, have been even more remarkable, but obviously cannot here be dealt with from considerations of space; it is the body proper of the camera, moreover, that is under discussion rather than its keen-sighted eyes. The subject is full of interest, and much, very much, has, perforce, been left unsaid.

It is a pity that representative types of all the older cameras, and other photographic apparatus, cannot be preserved in some national collection, many that are now quite vanished being reconstructed for the purpose from contemporary descriptions. An excellent, though small, display of the kind may be remembered as one of the attractions at the Royal Photographic Society's Crystal Palace Exhibition of 1898. A larger and more complete permanent exhibit would be of great educational and technical value, more especially in years to come.

"IS PHOTOGRAPHY A FINE ART?"

This question has for the past few years agitated the amateur scribblers of our little world, and scarce one of these quill-drivers has seen the grotesque humour of the whole business.

They have written after their kind and for various purposes, to advertise themselves, for pelf, or pricked on by an egotistic vanity of all-consuming proportions. The matter will serve some student of degenerates in the future, as has been pointed out already in these pages, for most of this illogical gush bears its own hall-mark—the stamp of what Professor Lombroso has classified as the "Mattoid"—that useful beast of burden in commerce, but the useless duffer when art is under practice or discussion.

Our ephemeral periodicals are so rich in this class of verbosity that scarce any number is entirely free from the poison. One often wonders if anybody reads the stuff except the crazy writers of it, or if it be a sort of sawdust used to pad the vapid pages and interspaces between reproductions of photographs—which are in some cases excellent.

Nor have the serious records of the photographic world altogether escaped this murrain—scientific photographers have once or twice, in moments of wool-gathering or hard-up-means, permitted themselves to drop down to it, and even artists have unwisely and timidly ventured into the field. It is indeed the age of the advertisement of the ego and of hysteria; but let us hope that in the first decade of a new century this hydra-headed hysteria will die of inanition and disappear. One of the chief curses of photography is that failures in all sorts of branches of life are constantly entering its ranks, aspiring counter-jumpers, soiled bagmen, scorned daubers, and criticasters who have been held up to contumely in the art or literary world—they and many more come down to us, and, innocent of our history, customs, and achievements in the past, begin to issue their cocksure drivel, and for a time prosper, but they are always found out in the end.

The questions "What is Art?" and "Is Photography a Fine Art?" cannot be answered even by the majority of the ablest painters and other artists of the world. They can, of course, tell if a particular work be art or not, a good one or bad one; but the wise artist never bothers about the greater philosophical questions—they are not for him, they belong to philosophy. Imagine at any one-man show of painters' or etchers' work an "opening address" of such nauseous quality as we have been listening to during the last few years. Think of artists of various ability and fame philosophising on "Painting as a Fine Art." Reynolds essayed this feat and failed, but Reynolds was a very vain man, and many of us consider him not of the first rank.

No; the fashion has been for artists to stick to their work, and leave criticism and philosophy of the higher sort to those qualified to discuss them, and "criticism" of the lower sort to those who are not men enough to earn an honest living by road-mending or honest labour.

Let us for a moment consider the equipment necessary for a philosopher upon art. First and foremost he must have an unerring and delicate vision, and an instinctive *flair* for the beautiful—it must not be a cramped vision—he must recognise at a glance the beautiful vision in all the graphic arts—in sculpture, decoration, photography, and nature.

It is common for us to produce art writers who are sure and sane on one head of art and blind on the other. For example, Mr. Henley is an excellent—so far as he goes—critic of painting, but on sculpture he falls all of a heap, and is a poor object indeed. Indeed, we have ever opined that there are nine expert critics on painting to one on sculpture; in fact, sculpture is the shibboleth—a really good critic of sculpture is generally a good critic of all the arts, though a sculptor is often a bad critic of painting, and *vice versâ*, for they both "go for different things."

Secondly, a sound critic must have some practical acquaintance with at least one of the arts—he must have a thorough grip of it fundamentally, or he will go to pieces sooner or later, as did the party of critical duffers pilloried by Mr. Whistler in his *Gentle Art of Making Enemies*.

Thirdly, he must have a wide knowledge of art—he must have seen and studied the art of all countries, and have travelled largely. For example, the superficial often condemn the horses of some of the best of the Spanish painters, but any one familiar with Spain knows the kind of horse well, and that it is racy of the soil.

And lastly, but most important of all, he must have a scientific general education. It has been said no man is educated unless he knows all about one subject, and something about every subject. In any case, no man can even attempt to write philosophical criticism upon art unless he had a sound anatomical and physiological basis, superimposed by a sound knowledge of psychology—I mean a professional knowledge of the subject, which cannot be acquired under three years' hard work in proper schools at the very least. And as a rider to this of course must be added a practical knowledge of photography and its achievements.

The writer who attempts to write upon such a question as "Is Photography a Fine Art" without this equipment is either a conceited ass or a charlatan and impostor. And the same applies to critical articles on art. The lamentable blunders of Messrs. Ruskin and Hamerton will not soon be forgotten, and the hard names applied to them by Mr. Whistler were well deserved indeed. Mr. Ruskin is reported in his better days to have said he ought to have been a preacher—a clergyman—and for once no one will dispute him. Mr. Hamerton tried to learn to paint and failed, as did Mr. Ruskin, and he, too, confessed poverty drove him to write upon art. The story is the same all through the act. There are dozens and dozens of living painters who could easily write more sense upon art in one article than Ruskin ever wrote upon art in a lifetime.

All this does not mean discouragement for the pictorial photographer; on the other hand, we would at the commencement of a new century lift a great incubus from his shoulders, and beg him to leave scribbling severely alone, more especially upon such abstruse questions as the philosophy and criticism of art. His duty is plain, it is to do the very best photographs he can, and he will in that way be aiding the cause far better than in any other way, and let him leave writing to vain windbags or professional authors and philosophers. Some of the best and most enduring reputations in photography have been made by those who never scribbled—Mrs. Cameron, Messrs. Hill, Hollyer, Gale, Moss, Cadby, Wellington, Crooke, Werner, and dozens of others are cases in point.

There are many capable artists and some photographers who are good critics of pictures or photographs—they can say with certitude "this is right," "that is wrong," "this is good and that is bad," and they will be generally found to be in the right, but that gives them no right save to *act* as judges, and record their judgments; but directly they begin to question, "*Why* is this right or wrong, good or bad?" they enter fields in which they have no knowledge, and then they are at sea and *always wrecked*, for a special training is required to discuss such questions.

If our ablest photographers would confine themselves, in the better class papers, to giving us their experiences and researches, we should be a wiser and pleasanter body of men, for these stupid scribblings on "Photography and Art," "New Schools," &c., are, besides being a conceited pastime and a pure waste of time withal, very deleterious to the *morale* of our rank and file. Recrimination, down-heartedness, jealousies, &c., are all aroused by these scribblings on art. Did great good come of it, the price might be worth paying; but, since no good, but evil comes of it, it is an unspeakable folly—a folly that cuts both ways, on the readers and on the writers.

Some photographers seem to think it glorious to scribble for amateur journals, but many of them are too green or too vain to see that they are exploited by the tradesmen, who now turn journalists with the idea of getting cheap copy as they get cheap photographs, by never paying, or paying contemptible prices, for these productions, and so the great conspiracy for fleecing the amateur goes on and the professional starves.

It is an unsavoury subject, but, when a counter-jumper takes to "art" and "literature," there is only one result to be expected. For the sake of pictorial photography nothing could better happen than that these amateur journalists should miserably perish.

So for the new century let the motto of each good and true pictorial photographer be—*I photograph and exhibit in silence*, and on the tombs of such elect let there be incised, and filled with the purest gold, the words—*A wise and honest photographer, he never bleated.*

NOTES ON TWO OLD LENSES.

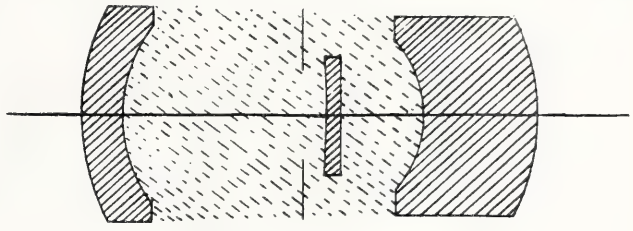
Through Mr. P. Everitt's kindness I have had the opportunity of ascertaining the particulars of two old lenses, which I communicate to the readers of this Journal as follows:—

The first of them bears the inscription "Sutton's Patent Cylindrical Lens, No. 23. Made by F. J. Cox, Skinner-street, London." As regards the time of construction we only know the date of T. Sutton's introductory article, which appeared in 1860. Apparently only a very few numbers of this otherwise unknown type have been made, and so it may be considered justifiable to give the date of construction of the objective in hand as the same year, 1860. In this specimen the finish of the surfaces is not of high perfection, so that the data given in the following are to be considered as fairly exact only:—

$r_1 = 33.3$
$d_1 = 5{\cdot}7$
$r_2 = 21{\cdot}2$
$b_1 = 25{\cdot}5$
$b_2 = 3{\cdot}5$
$r_3 = 123{\cdot}6$
$d_2 = 2{\cdot}1$
r_4 = very slightly concave
$b_3 = 11{\cdot}6$
$r_5 = 15{\cdot}7$
$d_3 = 16{\cdot}3$
$r_6 = 31{\cdot}5$

$L_1 L_2 L_3$ glass lenses holding the collective water lens between them.

The equivalent focal length seems to be about 10 cm. (4 in.). The objective showed on the ground glass small remaining astigmatism, but the curvature of field was very considerable. The principal



T. Sutton's Cylindrical Lens. Nat. size.

drawback of this system was the circumstance that water formed the collective parts. One of the difficulties arising therefrom, the tightening of the lens mount, was overcome by using a leather ring which was compressed by screwing the anterior cell into the tube. An interior diaphragm being fixed just in front of the inner dispersive lens, there was no contrivance in this specimen for altering the aperture of the objective. On the whole, we can easily understand the limited demand for this lens.

The type of the second objective, the orthoscope, has met with much more approbation, although it is now almost forgotten. The mount bears the inscription "No. 10,393, Voigtländer & Sohn in Wien und Braunschweig." I have to thank Mr. W. E. Debenham for kindly placing this lens at my disposal, through Mr. Everitt.

From an article first published in a daily paper and afterwards reprinted in a photographic periodical,[1] we learn that number 10,000 of the Voigtländer objectives was attained late in 1861. We are therefore entitled to date the present objective as early in spring of 1862. The type of construction is (approximately) given in fig. 103, p. 258, of my *Theory and History of the Photographic Objective*, and I subjoin the following particulars:—

Focal length, 452 mm. (17¾ in.), rel. aperture, 1 : 14·8.

$r_1 = 104{\cdot}9$
$d_1 = 9{\cdot}1$
$r_2 = 83{\cdot}4$
$d_2 = 1{\cdot}9$
$r_3 = 824$ concave
$b_1 = 20{\cdot}0$
$r_4 = 260$
$d_3 = 2{\cdot}2$
$r_5 = 148$
$b_2 = 1{\cdot}5$
$r_6 = 365$
$d_4 = 3{\cdot}4$
$r_7 = 104{\cdot}9$
$b_3 = 4{\cdot}0$

$L_1 = L_3 = 1{\cdot}517$
$L_2 = L_4 = 1{\cdot}575$

After reduction to the normal focal length of 100 mm. (4 in.) the radii differ from the original data supplied in the controversy between Fr. Voigtländer and J. Petzval; the refractive indices seem to be the same as given in J. M. Eder's *Handbuch*, the focometrical measurement I made furnishing results in good accordance with the numbers above. To my regret it proved impossible to ascertain from this specimen the original position of the dispersive crown lens; if I may give my personal opinion, it was in accordance with the *old* formula, so that the deep curvature was turned towards the image.

The finish of the surfaces is fairly good; the mount is a simple, rigid mount (I may mention that J. Petzval tried to introduce a tube allowing for shortening and lengthening of the distance between the two combinations, in order to introduce spherical aberration at will). The diaphragm was applied at the back of the objective, and a number of them were supplied apparently, although I was only in the

[1] Kreutzer's *Zeitschrift*, 1862. 5. 38-39.

possession of one stop. This specimen was not corrected for colour: according to the measurements made by R. Schüttauf, the chemical focus for distant objects on wet-collodion plates (as used in the early sixties) is about 5 to 6 mm.

Although the outcome of the present inquiry failed to give certainty respecting the position of the inner dispersive lens in the orthoscope, there are some other points with which we have become acquainted. Moreover, this is the only method at present available for arriving at a correct notion of our ancestors' ideas on lens construction. In one important point our knowledge is specially deficient, that is with regard to the objectives designed by Th. Grubb. There is no doubt about his ability in experimenting and forming correct ideas on the performance of lenses in general; but concerning his own construction, the "aplanatic" and its combinations, our information on details is practically *nil.*

I should only be too happy to make the measurements of such an objective could any kind reader give me the loan of the same for a short time. Needless to say, that every possible care and precaution would be taken.

Dr v. Rohr.

A PRACTICAL DEMONSTRATION ON THE MAKING OF LANTERN SLIDES BY CONTACT AND REDUCTION.

This was the title of a paper read before the Sutton Photographic Society, and which was illustrated by the actual making of slides, as well as by showing a number of slides, on the screen.

In the production of lantern slides several things have to be taken into account, and I may conveniently divide the subject as follows:—

1. The character of the negative.
2. Making slides by Contact.
3. Making slides by Reduction.
   (*a.*) Using daylight. (*b.*) Using artificial light.
4. Development of slides.
5. Clouds or skies in slides.
6. Toning, or otherwise altering the colour of the image.

1. Choice of Negative.

First, then, in selecting a negative, it has to be considered whether it is suitable for contact or reduction, because, although a pretty bit may be selected from a large negative, and although a quarter-plate may often furnish a good slide, yet, unless the idea of ultimately using these negatives for making slides occurred to the person taking them at the time he or she took them, the chances are that something will be sacrificed; moreover, a square picture, such as is thus obtained, is not generally to be recommended. Secondly, there is the really good negative, which will give a satisfactory result with any process, but in addition there may be a *dense* negative or a *thin* negative, and likewise a *hard* negative, which, generally speaking, does not produce a pleasing slide.

2. Slides by Contact.

Slides by contact may be made either by daylight or artificial light; but, as they are probably mostly made by amateurs in the evening, I shall only refer to the artificial light method. In the case of the *dense* negative, referred to above, printing the slide should be made close to the light, while the *thin* negative should be printed at a distance, and I may say that it is better to increase the distance than to alter the light or time of exposure. But, when very warm-coloured slides are required, both light and distance may be altered, the developer being of a suitable character. As with negative plates, so with lantern plates, the product of various makers differs considerably, and with the same maker we often have the rapid and slow series of plates, the former generally giving us the black tones, the latter the warm tones. The advice I give here is to stick to one make of plate, and, as far as possible, one developer, following the instructions given by the maker whose plate you have selected. There are practically *no bad plates* on the market, they would have no chance. The slides which will be put on the screen later on, are chiefly on Paget plates, but some are on Cadett and Thomas.

Although it is customary to enter in an exposure book all details of the exposure of a negative, yet the practice of doing the same in the case of a bromide print or lantern slide is not nearly so common as it ought to be, and yet it would really be even more useful, as the conditions are more fixed than they are in negative-making. I would therefore recommend that notes be made of each exposure saying whether by contact or reduction, light used, distance from light, time of exposure, plate used, and what developer, not only as a guide to future operations, but as enabling the operator to at any time obtain an exact replica. In reductions these memoranda could be made on the white side of the mask, at the bottom, the name of the slide being at the top.

3. Slides by Reduction.

Slides by reduction, of course, have to be made in the camera, or by some piece of apparatus made for the purpose; and here I may say that either enlargements or reductions may be made by the same apparatus if the position of the lens can be altered. I show you a little arrangement made by myself, suitable for quarter-plate negatives, and usable either for daylight or by artificial light; in the latter case I use a condenser, made by Hughes, *i.e.*, one $4\frac{1}{4} \times 3\frac{1}{4}$, being therefore rectangular, and cut from a six-inch circular condenser. This is very convenient.

Daylight.

(*a.*) Using daylight—Have your apparatus so that it will take a half-plate negative, with a carrier for a quarter-plate *fixed* on one end of a board (of course a larger size may be used if desired), with a camera at the other end of the board, which should be *movable,* and have a rack-work adjustment for the lens, which may be a four-inch one, so that the baseboard may not be unnecessarily long, and stopped down to *f*-16. The negative having been put in its place, film side towards the lens, and the lantern plate in the camera, the apparatus may either be pointed directly to a clear sky, with no houses or trees intervening, or, it may be kept flat with a reflector of white paper or opal glass, placed at an angle of 45° with the negative. In either case, see that the illumination is even all over, and that the image is sharp and of the *right size,* which should have been previously marked on the ground glass of the camera. It should be borne in mind that the size of the picture in a slide by reduction, from whatever size negative made, is $3\frac{1}{8} \times 2\frac{1}{4}$, which is just a *little* larger than the opening in the mask. The exposure may then be made, but it is difficult to give an exact time for this; I may, however, say as a guide, that I have found from 20 sec. to 1 min., lens at *f*-16, according to the character of the negative and time of day and year, avoiding direct sunlight, about right. A piece of fine ground glass may be interposed between the light and the negative, and this would render about double or treble the exposure necessary. I show you two slides in illustration of this. In any case give *enough* exposure.

Artificial Light.

(*b.*) Using artificial light.—If a condenser is going to be used, nothing better than the apparatus I have shown you can be desired, but, if the lime light is employed, the exposure is so short, that risk of over-exposure is incurred, and it is therefore better to interpose ground glass, as already referred to. I show you two slides, with and without the ground glass; one had 3 secs., the other 6 secs.; and you will see there is not much difference between them. Everybody, however, cannot use the lime light, so a paraffin oil lamp, with a parabolic reflector behind it, about nine inches from the condenser, so as to get an even illumination, will answer the purpose; but, of course, the exposure will be longer. If, however, a condenser is not available, then place a piece of fine ground glass about three inches behind the negative, and either have a paraffin lamp, with a reflector behind it, on each side of the ground glass, or pass a piece of burning magnesium ribbon to and fro, to illuminate the negative evenly, and give a fairly long exposure. Either of these two latter methods should be tried on the ground glass *camera-screen,* before putting in the lantern plate. As before stated, let the exposure be ample, but not excessive.

4.—Development.

The exposure, by whatever method, having been made, the next process is to develop the plate, and, in choosing the developer, four things have to be borne in mind, *i.e.*:—

(*a.*) The kind of plate used.
(*b.*) What the exposure has been.
(*c.*) The colour required.
(*d.*) Whether the slide is to be shown by oil or lime light.

(*a.*) Many makers send out two kinds of plates, fast and slow; the fast are, perhaps, most suitable for exposures made by gaslight and for black tones; the slow for exposures by daylight, either by contact or reduction, for magnesium ribbon, for the lime light, and for the production of warm colours.

(*b.*) The longer the exposure, and a suitable developer, the warmer the colour of the slide.

(*c.*) Suiting both exposure and development, any colour from black to bright red may be obtained.

(*d.*) A slide to be shown by oil lamp, must be of a less density than one to be shown by lime light.

Bearing these facts in mind, then, I may state that for lantern slides the development should not require forcing; if it does, an indifferent slide is sure to result. What is wanted is a clean, crisp, surface image, which on projection gives a brilliant picture, with all details, not a hard black-and-white, or a fogged or veiled one. If black tones are required, nothing better than metol or hydroquinone, or a mixture of these two, together with eikonogen or amidol, can be employed. Most excellent results are obtainable with pyro on Thomas and Cadett plates, using their formulæ. I give you two very useful formulæ for black tones:—

1.

A.	Metol	50 grains.
	Hydroquinone	25 „
	Sodium sulphite	1 ounce.
	Potassium bromide	20 grains.
	Distilled water to	20 ounces.
B.	Sodium carbonate	2 ounces.
	Distilled water	20 „

2.

A.	Hydroquinone	120 grains.
	Sodium sulphite	1¼ ounces.
	Citric acid	30 grains.
	Potassium bromide	30 „
	Distilled water to	10 ounces.
B.	Sodium hydrate	120 grains.
	Distilled water to	10 ounces.

To make a normal developer, take equal parts of either A or B, and the development should be complete in from two to three minutes. With either of these formulæ the temperature of the developer should be from 60° to 65° F., because at low temperatures hydroquinone almost ceases to act at all.

Should, however, warm tones be wished for, quite a different procedure is necessary. The exposure has to be prolonged from two to six times the amount required for black tones, and the developer modified accordingly. Thus, supposing 30 seconds at 1 foot from a gas flame, or 1 inch of magnesium ribbon burnt at 3 feet, be suitable (as it is) for the above black tones, then for

Brown tones,	60	seconds	at	1	foot,	or	2	inches magnesium at 3 feet.
Purple brown,	90	„	„	1	„	3	„	„ 3 „
Purple,	3	minutes	„	1	„	3	„	„ 2 „
Red,	5	„	„	1	„	5	„	„ 2 „

would be the correct exposure, using Paget plates. The developer necessary is made as follows:—

1.

Hydroquinone	¼ ounce.
Citric acid	1 drachm.
Potassium bromide	30 grains.
Distilled water to	10 ounces.

2.

Sodium hydrate	¼ ounce.
Sodium sulphite	1¼ „
Distilled water to	10 ounces.

3.

Ammonium bromide	½ ounce.
Ammonium carbonate	½ „
Distilled water to	10 ounces.

All these solutions keep well, and are used in the following proportions for the different exposures:—

		Time to develop.
Brown tones:	Water to 1 ounce.	
No. 1, ¼ oz.; No. 2, ¼ oz.; No. 3, 50 mins.		5 minutes, about.
Purple brown:		
No. 1, ¼ oz.; No. 2, ¼ oz.; No. 3, 100 mins.		10 „ „
Purple:		
No. 1, ¼ oz.; No. 2, ¼ oz.; No. 3, 125 mins.		12 „ „
Red:		
No. 1, ¼ oz.; No. 2, ¼ oz.; No. 3, 150 mins.		15 „ „

I will show you results by each of these formulæ on the screen presently. If Thomas plates, however, are used, the exposure has to be much greater, *i.e.*, for brown, 2 inches of magnesium at one foot; purple, 3 inches at one foot; red, 6 inches at one foot. The same solutions as given above may, however, with a little variation (easily calculated) be employed, *e.g.*, for red tones, six inches of magnesium at one foot, and two drachms each of Nos. 1, 2, and 3. There is a peculiarity too about Thomas plates. I said above that the image should be a clear, crisp, surface one, but with these particular plates this remark does not hold, because the image seems sunk and indistinct, and density can only be judged by looking through it in front of a good yellow light, but it comes out all right in the fixing. The acid fixing bath will be found useful, as it acts as a clearer as well as a fixer. There are five points to remember in making these warm colour slides:—

1. The developer must be at 60° to 65° temperature.
2. The *warmer* the colour, the *denser* the deposit.
3. Warm colours lose more in fixing than cold ones.
4. In judging density for projection, especially with an oil lantern, attention must be paid to 2.
5. In case of over-density or slight veil, a judicious application of Howard Farmer's reducer is useful.

I have not referred to the Ilford Alpha plates, because time is limited, but, with these, colours are easily got without all the formulæ given above, and they yield brilliant slides, as I will show you, but they are very slow, and most suitable for contact work by artificial light, though magnesium ribbon greatly diminishes the time of exposure.

5. Clouds.

I now come to the last division but one of my subject, and an important one it is too. We can all remember the time when it was common to show a slide having a vast expanse of bare glass to represent the sky. This was not only very inartistic, but it dazzled the eyes and prevented them from having a proper appreciation of the picture below it. I will show you a couple of such slides presently. Latterly, however, matters have altered, and we see comparatively few of such slides. The first thing to do obviously is to make a good collection of cloud negatives, and suitable clouds may often be seen, especially in spring and autumn. Very strongly marked or storm clouds may, of course, be taken, and are very suitable for some subjects, especially seascapes; but, as a rule, it is inadvisable to have obtrusive clouds, because they are, after all, but adjuncts to the picture rather than the picture itself, and should not distract the eye. In taking clouds it is well to use a fairly rapid plate, a small stop, and a quick exposure, and not to develop too deeply (hydroquinone yields very good, clear, cloud negatives). But the most important point of all is to note at what time of the year and day the negative was taken, and also to what part of the sky (as indicated by a pocket compass) the camera was directed. These data should be permanently fixed on each negative. It may not be out of place to state that films, perhaps, yield better cloud negatives than plates, and, at any rate, I have got more natural clouds in views with films than with plates. Be this, however, as it may, films possess this advantage, that they may be printed from either side, and so prevent reversal of the clouds. This reversal applies to the contact method; by copying in the camera, *i.e.*, reduction, it is avoided by taking the sky slide *through* the glass of the sky negative. Clouds obtained, as suggested by Mr. Clayden, by means of the black mirror (*reflected* clouds), are excellent. These too can be printed direct without reversal. If then the negative is devoid of natural clouds, it becomes necessary to print

these in by some method or other, and there are three ways of doing this :—

1. Printing the clouds on to the slide itself.
2. Printing the clouds on to the cover glass.
3. As No. 2, using the slide itself as a mask.

1. To do this, get a piece of cardboard with a serrated edge, or cut roughly to the outline of the picture (or a rough print cut out, such as I show you), and during exposure keep this constantly on the move in front of the sky portion of the negative, unless this is so dense that there is no fear of its printing through, then replace the ordinary negative by a sky one, and expose again, but this time shielding the portion of the slide which had been previously exposed, remembering that sky negatives require only one-sixth to one-tenth the time of the landscape. Then develop, and, if after fixing it is found that the sky encroaches too much on the landscape, a *very careful local* application of Farmer with a brush will remedy this.

2. This is probably a better way: mark the lantern plate on the slides where the landscape comes, as a guide, then, having exposed one plate for the landscape, take another plate, and expose for the sky, carefully shading as before the landscape part of the plate, as indicated by the marks previously made, with the serrated card, or cut out print as above, for the requisite time, and develop and fix. Now place the two slides, *i.e.*, landscape and sky, back to back, and carefully clear away any superabundant sky with Farmer and a brush. This answers very well for the black tones, but is not quite so easy for the warm tones, as it is difficult to exactly match the colours. I would suggest, as a good plan, to have a lot of cloud slides made from different negatives, with different exposures, and different development, and consequently different colours, each carefully noted; you will then have always handy a sky negative for your landscape, and the only thing necessary will be to clear off any sky not wanted with Farmer.

3. This, with care, is a very good way; make your landscape slide and finish it, and then use it as a mask for the sky. Put into the frame first the landscape slide, then the sky negative film up, and then the lantern plate, and make the exposure, develop, fix, wash and dry. You will probably find a slight outline of some part of the landscape negative in the sky; if so, be careful that, in binding the two slides together, these portions exactly correspond. I show you slides prepared by all three methods.

6. Toning, &c.

I have at last reached the final division of the subject; but time is short, and, as I am anxious to *show* as well as *tell* you how to make slides, I must hurry on to a conclusion. I need not refer to intensification and reduction as means for improving slides, because I dealt very fully on this subject about this time last year, and my paper was published *in extenso* in The British Journal of Photography and the *Photographic News* at the time. Toning with gold, of which I show you a slide, is easy, using the sulphocyanide bath, but about twice the strength employed for P.O.P. Toning with platinum, of which I show you two slides, is also easy, using the chloro-platinite salt dissolved in water acidulated with either nitric or citric acid. Either of these not only alters the colour of the slide, but produces a slight intensification. The various colours obtainable by variations in exposure and development I have already referred to. A red-coloured slide is obtainable by the uranium toning process, and it can be made still more red by dissolving away the silver with Farmer's solution; again, this uranium red slide may be turned into a blue one by immersion in the following bath :—

Strong solution of perchloride of iron	8 minims.
Hydrochloric acid	16 „
Water	to 5 ounces.

a green colour is first obtained, which, by prolonged action passes into blue. Schlippe's salt, about ten grammes to the ounce, may be used to alter and slightly intensify the image, but the colour, as you will see, is not a very pleasing one. Lastly, there is a new and very interesting process by Mr. W. B. Ferguson, Q.C., *i.e.*, "copper toning," and which is fully described in the current issue of The British Journal Almanac, p. 876. It is only necessary therefore to refer to it very briefly, the formula is as follows :—

10 per cent. sulphate copper ..	75 c. c. (70 minims).
10 per cent. solution ferri cyanide potasssium	66 c. c. (60 minims).
10 per cent. solution neutral potassium citrate	570 c. c. (2 ounces).

The solution obtained on mixing these is of an emerald green colour, keeps well, and does not stain. Colours ranging from purple-black to cherry-red are obtainable according to the time of immersion. I need hardly say that in all these toning processes, washing must be thorough, and that day light must be used to judge the various colours.

I will now expose and develop half-a-dozen slides as suggested in my previous remarks; after which I will, with the kind assistance of Mr. A. P. Hoole, put on the screen a number of slides produced by every one of the different processes I have referred to. And now I must apologise for the length of time I have kept you, in spite of all my effects to condense the subject-matter of this paper as much as possible.

J. H. Baldock, F.C.S.

ART PHOTOGRAPHY.

II.

While a great deal may be gained by the study of good photographs, he who wishes his work to reach the highest merit will gain far more by the study of the best examples of the best painters. A slide is now shown exemplifying (although in a rather minute way) the beautifully simple yet powerful composition and lighting in Orchardson's pictures. Another slide shows a notable picture by Gainsborough in the National Gallery of Scotland, the portrait of the Hon. Mrs. Graham, where it will be seen the management of the lighting is of a somewhat more complex nature. The next slide is a picture by Greuze in the same Gallery, "Girl and Dead Canary," very admirable for simplicity, delicacy, and beauty of composition. Another quality observed, the balance of opposing masses or unifying of opposing groups, is seen in the next slide, exemplified by Turner's "Old Téméraire," MacCulloch's "Inverlochy Castle," and Orchardson's "Napoleon on Board the Bellerophon."

The slide now exhibited shows two pictures, one a photograph called the "Ghost Story," by a deceased photographer, Terris, Markinch, and a painting by G. P. Chalmers, R.S.A., called "The Legend," and is intended to illustrate the difference observable between the best photographic groups and those we find in first-class pictures. It will be noticed that there is too often a huddled appearance, as well as a feeling of artificiality in the photographic grouping that it should be our aim to avoid as far as our means will permit.

It goes without saying that, if it is very difficult to make a successful group of people, the difficulty is not diminished when we have to deal with animals. Still, by using great patience—and many plates—it can be done. This slide, by an amateur, is, I think, a delightful group of lambs. It will be noticed that the attractiveness of the picture is due almost entirely to the lambs, and therefore very little to the surroundings, although these are very appropriate. The next slide shows a group of black cattle, perhaps fair enough, but with little claim to be called artistic.

Before passing from this division of the subject I would like to say that it seems to me that some of our current criticism of photographs is far too artificial and wooden. Rules may sometimes be wisely broken, and it is absurd to condemn a picture for some petty violation of a conventional precept. Let us not live in too much terror of that sort of thing. We constantly hear pictures condemned for "mere prettiness." That is right criticism, although it is sometimes applied unjustly, but how is it that we hear pictures so seldom condemned for the opposite and far more common and more serious fault — sheer ugliness? Mere prettiness, sheer ugliness—I fear the latter quality, passing as force—is somewhat in favour at the present time.

We now arrive at the division dealing with the use of technical means to modify normal working of processes.

In photographing landscape we rarely, if ever, get in our negative exactly the particular strength of light and shade and the exact degree of aerial perspective which characterised the scene at the time of our operation. Either or both will be modified to a

greater or less extent. Even the most experienced can hardly tell beforehand the particular quality a negative will possess. It is not difficult to understand why this comes about, because so many things—length of exposure, character of plate, manner and degree of development, &c.—will affect the result. By one or other of these causes or by all combined contrast may be varied within extremely wide limits. The result need not necessarily be worse than if the negative could only be made to give an exact reproduction of the scene as affected by the conditions of light and atmosphere at the particular moment. It may, indeed, just as likely be better. At the time of photographing the amount of haze may be more or less than we could have wished, and the quality called aerial perspective consequently either in excess or deficient. Even if the scene were visually all we could desire, we have our short scale attainable on a surface of paper to contend with. It is, therefore, distinctly advantageous to us, this power we possess of modifying contrast and aerial effect, but it is probably the wisest policy to exercise this power of modification in greatest measure when printing rather than in the making of the negative. I believe that most photographers aim at the production of a fairly vigorous negative, knowing that by various means they can produce proofs possessing almost any effect that may be desired. As a matter of practice they produce a variety of effects from the same negative, and choose that which, either by accident or design, best fulfils their ideal. Possibly a photographer may happen on a print that is finer than anything he had preconceived. There is nothing wrong in all this, although we might feel prouder were it otherwise. Indeed, it may be whispered that even among good painters it is not uncommon for a picture to turn out entirely different from the original intention, and it is certainly a fact that painters get their fine effects by accident sometimes, just as photographers do. It is undoubtedly the highest faculty to produce exactly and always what is intended, still it is something to be able to see and know a good thing when it comes in our way unsought. The nugget picked up by accident is just as good as that got by painful labour in the deepest lodes.

I now wish to say something on the subject of photography as applied to portraiture. First, I will show a portrait of Carlyle, by J. Patrick, Photographer, formerly of Kirkcaldy, now of Edinburgh. I take this to be the best and most satisfactory portrait of Carlyle that I have seen. It is the high claim of artists that they reveal in their portraits the spirit of the man, that they reveal characteristics only perceived by the eye of genius. Now, there is a certain amount of good, solid truth in this statement, but when artists make what is simply a bad likeness their admirers not unfrequently say that they reveal the real man, not the man as he is known to the tax-gatherer, but the man as he would appear in his most exalted moods, and so on, in a strain not altogether remarkable for simple honesty. I dare to think a portrait must in the first place be a true likeness, and as much as possible may be added to that of the artist's conception of the nobler qualities of the man. In this photograph I think we see the real Carlyle, we are taken as it were into his living presence, and we can see in his face whatever of outward evidence, at least, the fiery thoughts and emotions of more than three-quarters of a century have written there. We see expressed, not vulgarly, and with overpowering emphasis, yet clearly enough, the precise amount of attention the man gave to personal appearance—we see that, though he is no precisian in matters of dress, and does not despise the tailor and barber, his acquaintance with them is not more than becomes a man whose concern is with the weightiest and most abstruse matters that can occupy the mind. Compare this with a portrait greatly admired by artists, and therefore presumably rich in the qualities they most admire. We find the chief concern had been to arrange the clothes, hat, and so on in a strikingly picturesque way, and the man becomes too much a painter's model. It is a somwhat meek Carlyle, who sits parallel to a wall. I fear it was not Carlyle's distinguishing characteristic to sit parallel to anything. I will now show two portraits by eminent artists, the first a portrait of Dr. Adam by Raeburn, the second of Sir Fettes Douglas by the present President of the Royal Scottish Academy, Sir George Reid. In the case of Dr. Adam the beauty of the soft broad shadows and the kindliness of expression are something for the photographer to aim at. The second portrait is also broad and simple in treatment, as well as forcible in expression. It is not possible in photography to reach the peculiar perfections of painting; yet, if we put the truth in the highest place, truth higher even than beauty as a factor in art, it will be found that in this particular branch of art—which is also the most important of all—photography takes no humble place. It cannot be denied that, while the number of admirable portraits painted in any one year is but small, because the cost is so great and those capable of producing them are so few, the number of fine photographs is countless, and their value as a means of securing a lasting memorial of the form and features of those we love or are interested in is beyond all calculation.

Perhaps a few words may be allowed on the general relation of art to photography. All who have acquaintance with the subject are aware that there is an extraordinary antagonism between science and art, so that a picture possessing the distinctive qualities of both cannot be entirely satisfactory. This fact is unfortunately made use of to justify pictorial representations which are contrary to science, which in consequence reveal only the ignorance of the artist. I remember seeing in one of the magazines an engraving of a locomotive in which a single six-foot driving wheel was coupled to a three-foot trailing wheel. However good such a picture might have been in every art quality, it would be perfectly intolerable to any one who could appreciate such a mechanical absurdity. This is one instance from multitudes of the same kind, which make it clear that no art quality can redeem a picture which exhibits glaring stupidity or ignorance of facts. The productions of artists must advance with advancing knowledge. No artist would now put the conventional painters' lightning in a serious picture, although it has taken its place as a conventional symbol representing lightning or electricity. Every one feels that the true appearance of the lightning flash as revealed by photography (the truth of which is confirmed even by the evidence of unaided vision) is far more pictorially effective. In like manner, waves were generally represented by the older painters with a monotony of form, if not a conventionality of style, which in point of truth was little superior to the painters' lightning. Photography has for ever put such painting to shame. Nothing in nature is more complex in form than a wave, consequently nothing presents greater variety than the lights reflected from its surface, or transmitted through its mass. Each wave is the product of many waves. The great roller has on its bosom waves, the waves wavelets, and the wavelets ripples. So far as I am aware the infinitely beautiful and varied phenomena of wave and ripple were first clearly and fully shown by means of the camera. It can certainly be said that the eyes of painters have been opened to the beauties of these by the camera, and that they now paint them with a fidelity formerly unknown. Many other phenomena of the same sort might be pointed out, but there is not time to deal with them.

It is the great aim of some photographers to make their work indistinguishable from wash drawings. It is true that by taking uncommon pains we may succeed in a superficial way in doing this. But the question comes to be, Is it wise to do so? Is it wise to take so much time and trouble to try to get such a fictitious quality when, by means of the brush, a superior result can be got much more readily? Is it to be presumed that the man who can so well work upon the photograph by retouching, and by means of masks and various appliances as to make a broad and perfectly-balanced composition, is qualified to do the like with colour and a brush? Unfortunately there are some who go beyond the point we have spoken of, and introduce what is known as "fuzziness," obscurity, and confusion in the attempt to emulate some modern schools of art. Many of these pictures resemble the sonnets which a certain kind of people take delight in composing and editors print in their magazines, but not one person in a hundred reads beyond the first line, if as much as that. Triumphs of technical excellence these sonnets may be, but the misfortune is that they are devoid of all human interest. Pictures of the modern decadent and decorative variety are often defective in the same way, being mere blown egg-shells, sometimes pretty on the surface and pleasing to the eye, but without a particle of food for the mind.

Which of us is not thankful for clear, normal vision? Are we not all glad that we see things as they actually are, not distorted, contorted, spangled, speckled, bedizened, bedarkened, as if seen through bits of broken bottle, mere phantasmagoria, amusing only to children? Let us, therefore, not put on too high a pinnacle of admiration the art whose chief end and aim is in doing that same thing. And, when the critic tells us to "condemn no form that art assumes, but to try to appreciate it in every guise," let us first consider whether we shall do wisely in trying to acquire a taste for every extravagant or, mayhap, affected style of work that may appear, just because, if we are very willing and very apt, we may in course of time be able to blind ourselves to its insanity, and see alone some trifling quality of which it may be the unique possessor. Let us

be on our guard against senseless laudation of "broken-bottle" schools of photography, for there is something of this in the air at present. As there is poetic licence, so there is artistic licence, there is poetic truth as well as prosaic truth, and, while we aim at the highest, let us take great care not to shoot beyond the mark of sobriety. Photographers, of all men, ought not to try to throw the reins on the neck of fancy.

The world, with all its boundless wealth of beauty, wonder, and majesty, was not created, probably, that dilettanti might pass idle, desecrated lives in listless pleasure, but rather that the great mass of thoughtful men, whose lives are devoted to honourable and useful work, whether in higher or lower spheres, looking at the manifestations of love, wisdom, and power around them, might "follow nature up to nature's God." To my mind, therefore, the first concern of the artist should not be to paint pictures only that art critics and connoisseurs might babble about their "silvery tones," "magnificent brush work," "masterly technique," "mysterious suggestiveness," and all the rest of it. I do not despise these things, very far from it. But my first concern ought to be to paint pictures to strike home to every intelligent, observant lover of nature, though he had never before seen a picture and knew nothing of the shorthand of art. For one who can appreciate technical quality in pictures there are a hundred who feel when something that has delighted them is strongly and clearly put before them. If my picture does not appeal to, and give delight to, a Wordsworth or a Tennyson, be they ever so little learned in art, I ought to consider it in large degree a failure, and all the praises of all the critics should be small consolation. It is true that no picture can be of the highest worth that is not at the same time possessed of high technical excellence, but one thing is needful, and the latter quality alone is not enough. Many artists seem to have a belief that it is impossible to please both the artistically learned and unlearned, that a choice has to be made, and that, if good work is to be done, they must paint for connoisseurs and cognoscenti alone. There is little more than a superficial justification for this belief. The highest art should "enter in at lowly doors," and, in painting as in song, it should be the heritage of all. What is true of painting applies with equal justice to photography.

To get the greatest good from photographs they must be examined with patience, interest, and intelligence. The photographer does what he can to show what he considers most worthy of notice, but he cannot isolate and intensify as the painter can, and, as a consequence, the beauty present in a photograph is not thrust upon our attention. It is a poor photograph indeed which has not some little bit of charm in it. Yet the temptation to glance too rapidly over photographs is so great that every one feels it, and few try to resist it. Photographs are not to be raved about, to be absurdly enthusiastic about. Yet I suppose none of us attaches too much importance to his work, for it may have many uses besides its art use. A painting as a work of art may be perfect, or very nearly so, but a photograph, unless of a very simple or unimportant subject, cannot be perfect. But what of that? Do not most things charm through some slight defect, some failing from perfection? "Faultily faultless, icily regular, splendidly null," is the expression of a truth all must have felt. There is also a kind of beauty felt more than seen, finely described by Whittier:—

"Not beautiful in curve and line,
But something more and better,
The secret charm eluding art,
Its spirit not its letter."

I think every amateur should preserve in an album a copy of every photograph he takes, even if it is rather poor, and with no claim to be called a work of art. What diary, what biography read in printed books, could have half the interest, half the value to ourselves and our friends of such a pictorial record of our lives? The longer we live the more precious and interesting would these silent records become to us. Not only would we prize those that spoke to us of happy days, but those also that in the distant past spoke only of sadness, for

"Care and trial seem at last,
Through Memory's sunset air,
Like mountain ranges overpast,
In purple distance fair."

I have now finished what I feel to be, notwithstanding some prolixity, a most inadequate effort, and I can only trust to your kindness to overlook its many defects, and, where I have failed to make clear my meaning or fully to justify my statements on doubtful points, I hope you will allow honesty of intention and the desire to set forth only what is consistent with good sense and cultivated taste.

JAMES CRAIG.

Our Editorial Table.

LIESEGANG'S PHOTOGRAPHISCHER ALMANACH.

Ed. Liesegang, Dusseldorf.

WITH the present volume this bright little annual attains its majority, and we avail ourselves of the opportunity to offer our congratulations to Dr. R. Ed. Liesegang, under whose editorship the work has been issued for several years. The series of articles, forming the principal portion of the text, deals with many subjects of interest to the photographer, and the signatures comprise several well-known German authors. A portrait of Dr. Adolf Miethe forms the frontispiece, and a short account of this well-known optician's career is also given.

ERSTE ANLEITUNG ZUM PHOTOGRAPHIEN.

J. Gaedicke, Verlag des Photographischen Wochenblatter, Berlin.

THIS is a short guide to the various processes of photography involved in making a negative, and producing the print by any of the ordinary printing methods. Herr Gaedicke's name is a guarantee for the reliability of the work, and the conciseness of the style in which it is written should make this text-book a favourite with beginners.

A SECOND edition of Mr. S. L. Coulthurst's little book on "How to Make Lantern Slides" has been issued by Messrs. Dawbarn and Ward, Farringdon-avenue, E.C. Additional matter by Mr. G. E. Brown is included. Mr. Coulthurst is a capital worker, and understands his subject, so that the book before us is stamped with sufficient authority to give it place as a useful and accurate source of reference for those taking up a charming branch of photography such as transparency-making for the lantern.

A CASKET OF PHOTOGRAPHIC GEMS. 128 pp. Price 1s.

Published by Carter & Co., 5, Furnival st., Holborn, E.C.

A NEW edition of this familiar friend has been issued by Messrs. Carter. The book consists of a collection of five hundred up-to-date dodges, receipts, entertaining experiments, &c., in connection with photography, collected, classified, and alphabetically arranged for ready reference. Some of the information belongs to a period when photographic practice was different from what it is now, but the book, so far as we can see, is soundly compiled, and we do not hesitate to recommend it to those who have room on their shelves for a volume of useful hints, to which reference is frequently necessary.

PAPEROID.

Manufactured and sold by The Thornton Film Company, Limited, Altrincham.

PAPEROID is the name given by the Thornton Film Company to their latest flexible film, which has a paper base and is non-stripping. We have examined the samples submitted to us. The paper is of such a texture that it yields prints having no perceptible grain; it is evenly coated, and the emulsion is fairly quick. In use, precisely the same method of development as that adopted with plates or transparent films is followed, with the exception that it is advantageous to pin up the paper negatives for drying purposes. Paperoid is supplied in the flat or rollable form. Some of the best negatives in our possession are on paper, and they print the fine details surprisingly sharply. Those of our readers who can go back fifteen or sixteen years in photography will recollect that paper negatives for a time had a great vogue. It will be interesting to note if there will be a revival in this kind of work.

PHOTOGRAPHIC MOSAICS FOR 1901. Edited by Edward L. Wilson.

London: Published by Dawbarn & Ward.

THIS old friend, like many other publications, greets the young century in a new dress. Cover, type, paper, and printing are changed for the better, and "Mosaics" proudly takes its place as one of the most beautiful photographic annuals in the world. A glance at the articles shows them to be fewer than hitherto, but very readable and very useful. Commend us, however, to the many delightful half-tone illustrations in the book. These show at a glance what charm and spirit lie in first-class American professional portraiture, which is here so well illustrated that "Mosaics" is worth buying on that account alone. Wholly an elegant book, we congratulate Mr. Wilson and his associates on "Mosaics for 1901."

New Frame Edge and Title Negatives.

Manufactured and sold by W. D. Welford, 166, Romford-road, E.

Mr. Welford is issuing a series of designs in frames and shaded edges, into which the picture is printed by means of a mask. He points out that the negatives, being upon film, can be printed from either side. Another feature is that the title or description (or any wording) can be written on the back of the film, appearing in white or grey upon the finished print. The writing can be cleared off, so that each negative can be used for many pictures. The following are the instructions for use: Place the mask supplied with the frame edge negative upon the negative desired, and print to proper density. Then take the frame edge negative itself and adjust it so that the opaque portion properly fits over and covers the picture, and again print to full density. The result will be a framed picture. For titles and wording, write or print with some opaque medium (Chinese white is good; there are several opaque mediums obtainable at the dealers) upon the back of the frame edge negative as and where required. When dry it is ready for printing. If written on the back, it will appear correctly in the print, and, moreover, can be cleaned off again. The specimen sent us by Mr. Welford, who thoroughly knows the requirements of amateurs and professionals in photographic printing, show that by the use of these masks and negatives very pretty and artistic effects are obtainable in surface framing.

The Panel Series of Nature Mounts.

Manufactured and sold by Percy Lund, Humphries, & Co., Limited, Bradford.

Messrs. Percy Lund, Humphries, and Co. write us as follows: "We desire to draw your attention to our 'Panel' series of nature mounts, and to ask your acceptance of the accompanying sample packet. That many prints are improved by the addition of lines round or some simple device goes without saying; and, as many photographers do not seem to be able to or willing to handle the crayon or the compass pen, we have prepared for them a series of mounts ready for use. We are not entirely satisfied with the designs as they are at present, but we hope, with further experiments, to improve them." The mounts are neutral in tone, stiff enough to be placed upright, and the linear designs impressed upon them are both simple and effective. Photographs on matt-surface papers attached to these mounts will be much enhanced in effect, and we can recommend the Panel series to those who are discontented with the usual thing in supports for photographs.

The Bertha Retouching Powder for Bromide Prints.

Manufactured and sold by the Vanguard Manufacturing Co., Maidenhead.

The latest introduction of the Vanguard Company, which so skilfully caters for the smaller requirements of the modern photographer, should be greatly appreciated by the large army of bromide workers. The powder answers its purpose admirably, and the following are the directions for its use: Shake a little of the powder over the bromide print, which must be quite dry, and rub it in lightly with a circular motion, using a pad of soft white flannel or the palm of the hand. This treatment will remove all glossiness from the surface, and admit of any amount of retouching being done either with pencil, stump and chalks, or water colours. Of course, all dust should first be removed. This powder may also be used on varnished negatives to give a fine tooth for the retouching pencils. Apply lightly with the tip of a finger.

Notes on the use of the Wellington Papers.

Published by Wellington & Ward, Elstree, Herts.

Tastefully printed and bound, and illustrated with some charming specimens of bromide work, this 55-page book will be found a complete guide to the use of the justly popular Wellington papers. The book, which is written with knowledge, is full of useful information, and, as a copy is to be had gratis, every reader of this notice who makes application for one may take our assurance that he will have done a very wise thing. From the preface we cut the following particulars with regard to the personnel of this well-known firm:—"In photographic materials Messrs. Wellington and Ward have specialised by concentrating their energies upon the manufacture of the various forms of sensitive papers, and, at their works at Elstree, paper, and paper alone, is the end and aim of the many processes employed and the numerous machines in daily operation. Situated in a delightful country district, about twelve miles away from London smoke and fog, as rural as can well be desired, but so near to the main line of the Midland Railway as to be in touch with all the business centres of the country, Elstree, or, to speak with greater accuracy, Boreham Wood, is an ideal spot for carrying out such a process as the manufacture of photographic papers. Every facility in the way of fresh, dust-free air, an unlimited supply of pure water, and ample room for expansion, are at the disposal of the firm. The whole of the extensive works are under the personal supervision of Mr. J. B. B. Wellington and Mr. H. H. Ward, the former devoting the whole of his attention to work in the laboratory, whilst his partner has the control of the designing and construction of the unique machinery, most of which has been made upon the premises, the commercial side of the business being under the management of Mr. H. W. Hall. This machinery is capable of producing from three to four miles of photographic paper, forty inches wide, per day."

Catalogue Received.

B. J. Edwards & Co., Limited, Castle Bar Works, Ealing Dean.

The removal of the old-established firm of B. J. Edwards and Co. from Hackney to Ealing, and its conversion into a limited company, have given opportunity for the issue of a new book of prices, from which we make the following extracts: "The Directors have pleasure in calling attention to the increased facilities they have secured for perfection of manufacture, in their new and commodious premises at Ealing. The extensive experience gained by Mr. B. J. Edwards during the many years that he has been connected with the photographic trade in all its branches has enabled them to lay out their new factory to the best possible advantage, and, as they have at their disposal valuable formulæ and processes, the result of years of careful and costly experiment, they are now placing on the market plates and apparatus of first-class manufacture. These increased facilities will enable them in future to supply all their plates at popular prices. The factory throughout will be under the direct supervision of Mr. B. J. Edwards. Arrangements have also been made to devote attention to the manufacture of improved apparatus, and important patents have been secured for improvements in connection with camera construction. These novelties will be shortly introduced to the notice of the public." The new price-list, which extends to 40 pages, details all the photographic productions of the company, which has our best wishes for prosperity in its new home.

Mr. W. Tylar, of 41, High-street, Aston, Birmingham, is issuing a shilling view-finder, specially designed for use with hand cameras. Upon the top of one of these instruments it may be conveniently placed. The finder is one of the folding type, i.e., the ground glass, the mirror, and the double convex lens are jointed; but, by the aid of a simple catch arrangement, the finder is made to assume the ordinary shape, and the photographer may then look down at the small reflected image right side up. The finder, which answers its purpose, could not well be cheaper.

Commercial & Legal Intelligence.

The Gem Dry Plate Company, Ltd., of Willesden Green, N.W., have issued a sheet almanac for 1901, containing much useful photographic information.

Messrs. James Willing, Jun., Ltd., of 121, Strand, W.C., send us a copy of the 28th annual issue of "Willing's Press Guide." As a book of reference to the world's English-printed newspapers the volume is invaluable.

Mr. G. W. Secretan, the well-known trade printer and enlarger, of 210A, Tufnell Park-road, London, N., has issued a new price-list for 1901. We note that Mr. Secretan has been established for over 25 years.

The Glasgow International Exhibition.—Messrs. W. A. Mansell and Co., of 405, Oxford-street, London, W., have been appointed sole agents in London for Messrs. T. and R. Annan and Sons, who have acquired the concession of the exclusive right to take and sell photographs within the buildings and grounds of the Exhibition.

Messrs. Fuerst Bros., of 17, Philpot-lane, E.C., in sending us a copy of their latest price-list of photographic chemicals, remark: "You will notice that, in addition to our modern developers, papers, &c., we have also taken up photographic tabloids, as we feel that the demand for this form of chemicals amongst amateurs is increasing daily, on account of their portability and easy handling. We shall be pleased to furnish dealers with discounts on application."

Mr. W. F. Slater, of 5, Firs-parade, High-road, Lee, S.E., sends us his latest price-list of frames and mounts, and encloses the following note:—"Owing to the continual rise in the price of glass and other materials, the present price of frames will be increased 10 per cent. on and after January 21, 1901. Five per cent. of this should have taken place six months ago, but it was hoped the rise was only temporary. Prices are, however, still firm, and not likely to decrease for some time."

Claim by a Biograph Operator.—At the Merthyr County Court, on Friday last, F. W. Harvard, of Kennington, London, sued Alfred Norton, of the Prince of Wales Circus, Merthyr, to recover a sum of money due under a contract. It appeared the plaintiff undertook to give biograph performances of the "Passion" play for two weeks for £22, but the defendant complained that the performance was not so good as expected, and proposed to discharge his liability for £13. Plain-

tiff said the performances were not so successful as they might have been because too much light came from the gas lights and from the windows.—His Honour said if the defendant had counter-claimed and showed loss of custom he might have recovered something, but he had not done so. There would be judgment for the plaintiff for the amount tendered, viz., £13, and costs.

THE Austin-Edwards Monthly Competitions.—The following is the list of awards in the Austin-Edwards lantern-slide and film-negative competitions for January:—Lantern-slide Competition: £3 cash prize, H. Wild, Tunbridge Wells, "A Wet Night" and "All in a Garden Fair;" £2 cash prize, J. Stead, Heckmondwike, "Interior Norton Conyers, near Ripon;" £1 cash prizes, V. C. Baird, Broughty Ferry, N.B., "Please give me one;" Lieut.-Col. A. Dowdall, Chester, "Chatsworth Conservatory;" W. Page, Walworth, S.E., "A Cottage Staircase;" Miss E. Hawthorn, Islington, "Celebrated Horse, Hedon Squire;" J. Hartley, Colne, "A Happy Family." Film Negative Competition: The Frena camera, given each month for the best negative on an Austin-Edwards film, has been secured by Mrs. Howard Hayward, Territet, Switzerland, for her negative, "Scene from 'The Loan of a Lover.'"

IT is stated that there have been submitted to the municipalities of the United Kingdom, at the initiative of the Corporation of Glasgow, detailed proposals for the amendment of the Weights and Measures Acts, 1878 and 1889. The suggestions are conveyed in a memorandum by the Town Clerk and Chief Inspector of Weights and Measures of Glasgow, to whom the subject was remitted by the local authority. In the present Acts, it is pointed out, no power is given to inspectors to test the weight of made-up parcels in shops. During recent years the practice has grown of making up during the more quiet hours of business parcels of tea, sugar, meal, flour, and other commodities. These made-up parcels of goods almost invariably pass from merchant to customer without being weighed in the presence of the latter. In order that the practice may be effectually dealt with, it is recommended that the Weights and Measures Acts should provide:—(*a*) That goods sold by weight or measure in wrappers, &c., should be labelled with the words "net weight" when made up or kept for sale or sold; (*b*) that the said Acts should provide a penalty when goods sold by weight or measure are found to be short of the weight or measure represented; (*c*) that inspectors should have power to weigh made-up packets and to enter shops for that purpose. It is added that "the powers conferred on the Board of Trade by the present Acts leave too much room for local authorities to administer the Acts as they think fit. There is, therefore, very unequal administration throughout the country, particularly in the fees charged for the stamping of weights, measures, and weighing instruments." It is suggested that authority in this matter should be so extended as to secure uniformity of practice. Other proposals of a similar nature are added in the memorandum.

News and Notes.

THE Longton Exhibition.—The last day for receiving entries for this Exhibition is January 29.

WHICH should be Boycotted?—Mr. W. J. W. Stocks, of High-street, Uppingham, writes:—"In reference to your leaderette, "Which should be Boycotted?" I enclose a photographer's price list which lately came into my hands. You will notice there that he offers for 6s. extra on the price of small photos an enlargement (photo crayon, whatever that may be) and then states, similarly to the newspaper advertisements, that a guinea is usually charged for this alone. For a photographer to advertise in this strain is, I think, very disreputable."

THE Photographic Society of Ireland's Annual Exhibition of Photographs will be held in the Large Hall of the Society, 35, Dawson-street, Dublin, from Monday, March 25, to Saturday, March 30, 1901. The following class is open to all comers, gold, silver, and bronze medals being awarded:—For best picture, any subject or size, produced by any process. The gold medal will not be awarded unless there are at least 100 entries. There is an entry fee of one shilling for each picture sent in. The Hon. Secretary, Mr. W. F. Cooper, at the address mentioned, will be pleased to afford further particulars.

THE luncheon to Lord Roberts at Buckingham Palace.—The veteran photographer Royal, Mr. Horatio Nelson King, received instructions from Osborne to photograph the Lower State Dining, or Luncheon, Room prepared for the banquet. On this occasion, instead of one long table, five round tables were used, the centre one by the Prince of Wales, Lord Salisbury on his right, Lady Roberts on his left, and, facing him, the Princess of Wales, Lord Roberts, and the Duchess of Argyll. Mr. King had also on the last State concert to photograph the different groups of gold plate brought from Windsor to be used, as evidence of position of the various articles.

THE Basis of the Metrical System.—It is generally understood that the metrical system of measurements is founded on the measurement of a certain portion of the earth's surface—that a metre is the ten-millionth part of a quadrant of the meridian, that a cube the one-hundredth part of a metre each way will hold a cubic centimetre of water weighing a gramme. The correctness or otherwise of these data does not interfere with their usefulness, fortunately, for it is well known that an arc of a meridian varies in length according to its latitude. But the original measurement of the arc from Dunkerque to Barcelona is not correct, that a cubic centimetre of water and a gramme of water do not weigh the same. Finally a new meridianal arc is about to be measured. It will take four years, it is estimated, to carry out the measurement, which is to extend to six degrees of arc. The operations are to start in June next.

REDHILL and District Camera Club.—At the recent Annual Meetin the election of officers resulted as follows:—President, Mr. Francis H Ellwood; Vice-Presidents, Miss S. E. Duncan, Mr. James O. Grant Mr. Fredk. Izant, Capt. B. Marr Johnson, Miss Mabel Pelly, Mr. Ralp W. Robinson, Mr. R. Wyn Rucker, Mr. John Sterry, Mr. H. Speyer and Mrs. A. Thompson; Hon. Treasurer, Dr. H. J. Blackler; Hon. Lan ternist, Mr. A. H. Dunning; Hon. Secretaries: Portfolio, Mr. T. Perci vale Padwick; Journalistic, Mr. F. Martin Duncan; Excursion, Mr. A Fraser Torrance; General, Mr. William Rawlinson; Committee, Messrs Jas. A. Carter, B.A., F. Pullen Candy, W. J. Hatton, G. Wallace Peat Harold G. Perry, and Thos. B. Yates.

THE Rontgen Society announce that the President has placed at their disposal a gold medal to be awarded to the maker of the best practical X ray tube for both photographic and screen work. The competition is open to makers in any country. The jury will be chosen by the President and Council of the Society, and their names will be announced in the "Times" of March 1. Tubes intended for competition must be sent in, addressed to the Rontgen Society, 20, Hanover-square, London, W., marked "Tube for Competition," the package containing full name and address of sender, and must reach the Society not later than May 1, 1901. Conditions may be obtained on application to F. Harrison Low, M.B., Hon. Secretary, 12, Sinclair Gardens, West Kensington, London, W.

FIRE at a Photographer's.—Shortly after midnight, on Saturday last, the Sheffield Fire Brigade were summoned to the studio of Mr. G. T. Y. Dickinson, photographer, of Glossop-road, Sheffield. The building was a strongly-built one of wood. When the Brigade arrived they found every portion of it in flames. Two lengths of hose were run out, and with a plentiful supply of water, the flames were soon extinguished. About ten minutes after the arrival of the Brigade there was a loud explosion, which could be heard half a mile away. At first it was supposed that the gas pipe had melted, causing an explosion of gas, but it was afterwards discovered that the explosion was caused through the sudden evaporation of a bottle of ether and alcohol, used by Mr. Dickinson in his business. Among the cameras destroyed was one of the largest—if not the largest—cameras in Sheffield, in addition to a large number of valuable negatives, and some backgrounds were ruined. The origin of the fire is unknown, but the damage is covered by insurance.

ECLIPSE Photography.—At the meeting of the Royal Society, last week, Sir Norman Lockyer reported the results obtained by studying the photographs of the total eclipse of the sun, January, 1898, which were taken with the prismatic cameras. But for photography much of the evidences obtained by eclipse expeditions would be lost, owing to their fleeting nature. With it, however, we have a permanent record of what occurs. To the lay mind three years seems a long time to study the photographs, but it may not be so if the results be conclusive. It is said that no less than forty-two elements were enumerated as recognised, though not always with certainty. Amongst them were the familiar substances, calcium, iron, nickel, cobalt, copper, tin, lead, gold, potassium, sodium, and hydrogen. Many other substances familiar with us were, however, not found, such as antimony, mercury, arsenic, and silver. From the study of these photographs we are, to some extent at least, put in possession of what the sun contains, and, possibly, what it does not contain—thanks to photography.

COLOURED Lantern Sdiles.—When one witnesses a popular lantern show—by popular show we refer to those put before the general public—and there happens to be some coloured or tinted pictures, one cannot help noting the appreciation they meet with, notwithstanding that they may be anything but artistically coloured. Seeing that, it is surprising that so comparatively little is done in the way of coloured lantern slides. Those of us who are old enough to remember the "dissolving views" which for many years were one of the chief attractions of the old Polytechnic Institution, will call to mind the brilliancy of their colours and how widely different they were from the coloured photographic slides of the present day, however well they may be coloured; but that is readily accounted for. The Polytechnic slides were not small photographs, three inches square, but were painted on plain glass, and not on a photographic base, about eight inches by six, by skilled artists. Hence we had the colours in their purity. But with photographic slides the brilliancy of the colours is, of course, materially marred by the colour of the photograph underlying them. Still, effectively-tinted slides are a possibility, and it is not a little surprising that they are not more generally made a feature of than they are, even at photographic gatherings.

THE Burnley Exhibition.—The following is the list of the awards in the Burnley Exhibition, which was held on January 17, 18, and 19:—Open Class.—First prize, value £5, No. 20, Chas. F. Inston, M.R.P.S., Liverpool; second prize, value £3, No. 48, T. E. Corney-Wilson, M.R.P.S., Liverpool; third prize, value £1, No. 1, Miss Evelyn Boden, F.R.P.S., Derby; No. 553, R. S. Webster, Edinburgh (equal). Class A.—First silver medal, No. 126, Chas. F. Inston, M.R.P.S., Liverpool; second silver medal, 146, James Busby, Preston; bronze medal, 143, Chas. J. Harrison, Manchester, A.P.S.; bronze medal, 132, Dr. Barr, J.P., Rishton. Class B.—First silver medal, withheld; second silver medal, 215, Dr. Crump, Burnley; bronze medal, 193, Dr. Ellis, Liverpool. Class C.—First silver medal, 248, J. Leslie Shawcross, Blackburn; second silver medal, 244, F. Pinder, Burnley; bronze medal, 255, J. Leslie Shawcross, Blackburn (debarred), and awarded to 231, Dr. Barr, J.P., Richton. Class D.—First silver medal, 281, Chas. F. Inston, M.R.P.S., Liverpool; second silver medal, withheld; bronze medal, 280, Wm. E. Inston, Liverpool. Class E.—Bronze medal, 316, F. Whittaker, Nelson. Class F.—Bronze medal, 387, Dr. Crump. Class G.—Bronze medal, 404, F. Whittaker. Class H.—Bronze medal, 442, F. Pinder. Class I.—Bronze medal, 477, Dr. Crump. Class J.—First prize, hand camera, No. 5 set, F. Whittaker; second prize, bronze medal, 7 set, Benj. Slater. Specials for

classes E, F, G, H, and I.—First, 477, Dr. Crump; second, 478, Dr. Crump; third, 387, Dr. Crump; first reserve, 460, A. A. Bellingham; second reserve, 404, F. Whittaker.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
28.....	Camera Club	Members' Lantern Evening.
29.....	Aintree	Demonstration: *Bromide Enlargement.* John Harris.
29.....	Birmingham Photo. Society ...	Sixth Annual *Conversazione.*
29.....	Manchester Amateur	Annual General Meeting and Election of Council.
29.....	Rotherham	Prize Slides.
30.....	Borough Polytechnic	*Notes on Rejlander and his Work.* A. H. Wall.
30.....	Croydon Camera Club	Beginners' Night: *Instruction in Negative-making.* A. E. Isaac.
30	Photographic Club	Demonstration: *A New Gas for Portraiture and Printing.* Edward F. Chapman.
30.....	Redhill and District	Demonstration: *Optical Projection.* Arthur H. Dunning.
31.....	Camera Club	*Photography, from a Painter's Stand.* A. W. Rimington.
31.....	Hull	*Ives Photo-chromoscope.* A. H Ormerod.
31.....	Liverpool Amateur	*Some Practical Points in Pictorial Composition.* A. Horsley Hinton.
31.....	London and Provincial	Open Night.
31.....	Oldham	Demonstration: *Lantern-slide Making on Kristal Plates by Gaslight.* T. G. Ames.
February. 1.....	Aberdeen	*Stereoscopic Photography.* W. G. Borthwick.

ROYAL PHOTOGRAPHIC SOCIETY.

January 22,—Major-General J. Waterhouse (Vice-President) in the chair.

The Chairman said that he was sure that, under the circumstances of the great calamity that had fallen upon the nation, and indeed the world in general, by the lamented death this evening of our beloved Queen and patron, the meeting would desire to adjourn in respectful sympathy. He was sure that comparatively few people could ever realise to the full the good that the Queen had done for the nation and the peace of Europe during her long and prosperous reign. Exceptionally good health has always enabled her to devote an enormous amount of care and attention to the duties of her high station in life. She never spared herself, but consistently did her best for her people, from highest to lowest. The great loss which the country must now mourn was, doubtless, hurried on by the trials inseparable from the campaign in South Africa, trials that one can fully imagine to have been terribly severe to one of her advanced years and peaceful instincts. Her death would be felt as a personal loss to everybody, and one more sad could not be imagined. The absence of her advice and valuable counsel at the present time would be widely felt, but the country must hope to learn to go on as it has in the past, though deprived of the experienced guidance of the universally-revered lady who had just departed this life.

The Chairman's motion for the adjournment of the meeting was carried unanimously.

In conveying this decision to Mr. W. Edwin Tindall, who had come from Leeds to give a lecture entitled "Imitative v. Creative—a Comparison," the Chairman voiced the feelings of the meeting at the unhappy circumstances that prevented the fulfilment of his engagement that evening, after coming so far. He hoped that Mr. Tindall would find himself able to come up again some time next month and deliver the lecture which he was sure would prove most interesting.

Mr. Tindall expressed his willingness to do as the Chairman suggested. He felt that he could not, under the circumstances, have done justice to himself or his audience. He concurred with the remarks that had fallen from the Chairman, and again signified his readiness to visit London in the near future.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

January 17,—Mr. F. C. Kellow in the chair.

Mr. W. Tylar, of Birmingham, sent his representative to exhibit and explain the Dreadnought acetylene generator. The generator is suited for many purposes, amongst which may be mentioned lantern entertainments, house-lighting, copying, and enlarging. Portability and safety are specially claimed for the new generator, which will accommodate over a pound weight of the calcium carbide. The generator can be charged and left ready for use without fear of an overmake of gas; such is the claim for it. The gas can be turned off and on at will, hence its utility for the purposes named above, and the generator can be charged and started in three minutes. The bulk of the carbide of calcium, which is granulated, is supported quite clear of the water, and is admitted into the water automatically, according to the rate of combustion of gas. A small generator of this pattern, intended for lantern work, gives light for two hours sufficient for a 9 ft. circle. The jet has two burners served by one tap in a way that allows either of the burners to be extinguished, should particular slides require less light, as is sometimes the case. The light was used in the lantern for a short time, and some slides were shown.

The rest of the evening was devoted to the exhibition of members' lantern slides. The Chairman brought up several of Rottingdean and the South Downs, Norfolk, and miscellaneous places. There were also two views of the Dewey Arch, New York, erected in commemoration of his naval victories. One of the slides was described as reduced with cerium, and the entire absence of stain was commented upon. Mr. Featherstone showed some old Woodbury slides, made by the late W. B. Woodbury, the inventor of the process. The views were in Java, where Mr. Woodbury for some time practised as a photographer. The scenery and types of inhabitants were interesting in themselves, apart from the additional historical associations. Mr. J. W. Hodges showed the Mansion House when the roadway in front was paved with granite sets, the period being stated by Mr. Everitt as prior to 1872. Warwick Castle, Winchester Cathedral, and other subjects were also shown.

Mr. Lewis Medland had several photographs of new animals at the Zoological Gardens to show, also scenes at Barnet Fair, dogs, cattle, and types of hawkers who infest these country gatherings.

PHOTOGRAPHIC CLUB.

January 16,—Mr. Hans Muller in the chair.

Some discussion took place regarding the constitution of the precipitate formed by the admixture of chloride of gold and acetate of lead, and the characteristic colour of the same.

Mr. W. R. Stretton said that it was a yellow precipitate, which, if allowed to stand a long time, will deposit a purple film of gold. The toning bath, of which this mixture was part, gave a better result if the gold chloride were home-made. Hypo and alum dissolved the precipitate referred to. The stronger the gold chloride was in gold the richer was the deposit, and the richer the deposit the better the bath will tone. If the chloride be pale stuff, the deposit will be less strong. He found that the Eastman bath made up with commercial gold chloride did not give regular tones, but with his own gold chloride he got batches of as many as sixty prints without a suggestion of difference in tone. He had prints made in this way years ago, but they were quite good now. He said that precisely the same colours could be got without the lead.

Mr. G. E. Brown thought the precipitate was white and that the colour was that of the orange-coloured gold solution. He thought that the precipitate must be principally lead chloride, with a smaller quantity of acetate of gold; but he was not conversant with the latter substance.

Mr. G. W. Tottem referred to some trials of bichromate cells for dark-room illumination, with a view to eliciting some opinions about their utillty. Nobody seemed to have had practical experience of them, however.

Mr. F. A. Bridge and Mr. E. W. Foxlee both spoke of Hetley's double-flashed orange glass as safe for most classes of work. The first-named turned such a lamp to the wall for isochromatic plates, and worked by the reflected light.

Mr. Foxlee found ruby glass cause a most painful effect upon his eyes. He used two thicknesses of Hetley's glass, placing a piece of ruby in front for isochromatic work until the image is fairly out. Canary fabric or paper, which diffuses the light, is as comfortable as anything, but cannot be used alone for very sensitive emulsions or isochromatic plates.

Mr. A. Mackie showed a price list of an early firm of dry-plate makers, which was curious for the prices charged and the exposures prescribed. With a Dallmeyer 1B carte lens and a bright light, groups in the open air required 20 seconds. A 6 in. view lens with a ¼ in. stop, with an open landscape or marine view, required two minutes. Houses, with dark green foliage and shadows, wanted ten minutes. Church and cathedral interiors wanted all day. The price of quarter-plates was 4s. 2d. per dozen. It was thought to be the collodio-albumen plate of an old Manchester firm.

Croydon Camera Club.—There was a crowded roomful on Wednesday, 16tht inst., when Mr. E. A. Robins, representing Kodak. Ltd., gave a demonstration of the system of enlarging from Kodak film, approved by the company. Mr. Robins began by explaining the various makes of bromide paper which he intended using, including the favourite royal bromide, and also explained the system of toning advocated, i.e., alum-hypo. Following which, by means of a Hume cantilever lantern, using a "muffled" lens, in addition to the usual optical arrangement, and burning oxyhydrogen gas, he produced a capital 20 in. by 15 in. enlargement from a half-plate size film on royal bromide, the art of "quiffing" being also explained. Other enlargements were subsequently made, the developer in each case being "M.Q." (metol-quinol). This portion of his subject being finished, some of the newer patterns of the ever-popular Kodaks were shown and described. Included in these was the "Panoram," in which the lens travels through the arc of a circle during exposure, rotating the while on its optical centre. In connection with this, Mr. Robins showed some remarkable and funny results which can be obtained by misusing the Panoram. Thus a straight line may be rendered as a curve, a level stretch of country can be changed into a steep hillside, and an endless number of diverting metamorphoses of actuality indulged in. The No. 3 folding pocket Kodak was held to be the most attractive of the collection shown, and was much admired for its compactness and appearance.

Croydon Microscopical and Natural History Club.—The Annual Meeting of this Club was held at the Old School of Art Room on Tuesday, January 15, the President (Mr. W. Whitaker, F.R.S., P.G.S.) in the chair.—The accounts for the past year having been presented by the Hon. Secretary and Treasurer (Mr. F. T. Townsend), and passed by the meeting after a slight discussion, the reports of the various sectional committees, with the exception of those of the Meteorological and

Botanical Committees, which were postponed to the February meeting, were read. During the year, in addition to the ordinary monthly meetings and excursions, the botanical, geological, and photographic sections have been very active, and, by special meetings, excursions, &c., have endeavoured as much as possible to promote the work of the Club. The Museum Committee has had a succession of objects of local interest on exhibition in the Club's case at the Town Hall, and has now a good collection of bronze implements from the immediate neighbourhood, lent by the Croydon Corporation. Unfortunately, the Club has recently sustained a great loss by the death of Mr. Philip Crowley, F.Z.S., F.L.S., who from the commencement of the Club had taken a great interest in all its proceedings, contributing very much to its success as an ordinary member of the Council and as President. Mr. Crowley was also an enthusiastic photographer. A vote of condolence with the relatives of the deceased gentleman was unanimously passed, on the motion of Mr. Mennell, F.L.S., seconded by Dr. Franklin Parsons, F.G.S. The result of the year's work having been communicated, Mr. Whitaker, the retiring President, read some notes on scientific work in Surrey during the past decade, as a sequel to his address of January, 1900, on "Ten Years of Geological Work in Surrey." Mr. J. Epps, F.L.S., a good photographer, was elected as President in succession to Mr. Whitaker, to whom a vote of thanks was unanimously given on his retirement. A smilar vote was recorded on behalf of Mr. Townsend on his relinquishing the hon. secretaryship, which he had held jointly with the treasurership during the past year. Hon. Secretary, Museum, N. F. Roberts; Hon. Librarian, A. Rood; Hon. Lanternist, J. H. Baldock, F.C.S.; Photographic Committee: J. H. Baldock, Lanternist and Recorder; H. D. Gower, Portfolio Secretary; E. Pierce, Secretary; A. Roods, C. J. L. Russell, A. J. Weightman. The Council gains this year no less than three photographers.

North Middlesex Photographic Society.—At the Annual General Meeting, on January 14, the following were the officers elected for the year:—President, R. Child Bayley; Vice-Presidents, J. C. S. Mummery, J. W. Marchant; Council, S. Barnard, C. Beadle, H. W. Bennett, F.R.P.S., D. H. W. Broad, F. W. Cox, A. G. Lawson, J. MacIntosh, H. Smith, H. Stuart, C. R. Steele, W. Taylor; Librarian, F. A. Haylett; Assistant Secretary, T. Pring; Hon. Secretary, R. R. Rawkins, 5, Alma-road, Canonbury, N.

Liverpool Amateur Photographic Association.—The Annual Meeting was held on Thursday, January 17 (by kind permission of the Committee), in the rooms of the Artists' Club, the retiring President (Mr. J. H. Welch) in the chair. Six new members were elected and all the honorary members were re-elected. Dr. Llewellyn Morgan was elected President for the ensuing year, the other officers chosen being Messrs. E. Rimbault Dibdin and Joseph Appleby, Vice-Presidents; P. H. Phillips, Hon. Treasurer; and E. Simnett, Hon. Secretary. Messrs. F. A. Schierwater, J. H. Welch, Wm. Harvey, R. F. Soper, James Parkinson, Henry Lupton, and Dr. C. Thurstan Holland were elected to fill the vacancies on the Council. The awards of the judges in the annual competition were as follows:—For prints: Challenge trophy and gold medal, Mr. Joseph Appleby; Mr. T. E. Corney Wilson highly commended; silver medals, Messrs. A. A. Booth, G. T. Tickle, J.P., and C. Gostenhofer and Miss L. Harvey; bronze medals, Messrs. J. H. Canevali and John Lamb. For lantern slides: Challenge trophy and gold medal, Mr. J. H. Houghton; silver medals, Messrs. E. M. Ellis and J. D. Paterson. The competition prints will be on view for a fortnight in the Club Rooms, Elberle-street, on presentation of visiting card.

FORTHCOMING EXHIBITIONS.

1901.

February 16–March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S, 10A, George-street, Edinburgh.

„ 20–27 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath, S.E.

March 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Patent News.

THE following applications for Patents were made between January 7 and 12, 1901:—

CAMERAS.—No. 525. "Improvements in and relating to Photographic Cameras." Communicated by F. W. O. Lischke. Complete specification. A. J. BOULT.

CAMERAS.—No. 640. "Improvements in or relating to Cameras." Communicated by A. P. Prentice. KODAK, LIMITED.

PLATE-LIFTERS.—No. 663. "Apparatus for Lifting and Holding Photographic Plates and the like." A. C. KITZ.

PRINTING APPLIANCE.—No. 703. "Improved Means Applicable for Use in Fastening Canvas or like Aprons employed in certain descriptions of Photo Printing Apparatus." J. HALDEN.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

A CHANGE FOR THE BETTER.

To the EDITORS.

GENTLEMEN,—When I read the letter, signed "Anxious," in last week's BRITISH JOURNAL OF PHOTOGRAPHY, I rubbed my eyes and read it again.

Then I sat up, and began to think. Here am I, a ninth-rate photographer, scratching the hair off my head in trying to make a living—no, existence is the word—as the only man in a town of about 4000 people, under the impression that England was as full of photographers as a cat is of hairs, and secretly rejoicing that no one up to the present time has thought it worth his while to divide the population with me.

Yet, here we are told that a town of 28,000 has only one photographer. Is it in China, or perhaps Turkey? If in England, all I say is, "Happy Man! Your success is certain, even if you used wet plates, and only made collodion positives, a millionaire you must surely die." 28,000 people, and one photographer!!! Dear "Anxious," treasure up your town. Don't breathe a word of where it lies, whether in the cold Klondyke, or the sultry Sahara, or, by my halidom, if I get to know anything near where it is I shall certainly mark 14,000 of those people as my own, and the dear little wife will be sure of a new bonnet for the spring.—I am, yours, &c., OTHELLO.

A WAGES QUESTION.

To the EDITORS.

GENTLEMEN,—What I accepted as obvious is evidently not so to your correspondent, "G. W." I assumed that "Comyn" was not overpaid, because, from my experience of trade, employers do not engage an assistant at a weekly loss of £3 3s. By some means or another this firm must make it pay, or their business could not go on. If, then, one firm can do this, it must have methods of getting value in return for the higher wages paid. The trade union rate of wages is generally considered very high, yet some employers find it profitable to pay above trade union rates. It does not therefore follow, because some men receive more than the average rate, that they are overpaid, but rather indicates a far-sighted policy on the part of their employers. I would call the attention of "G. W." to the announcement that Kodak, Limited, are willing to give an advance of 5s. weekly to an employé who passes the City and Guilds of London Examination in Photography. Here there is no reference to the current rate of wages, fuller services commanding higher pay. An assistant is not overpaid until the market value of his output falls below the amount of his wages. If cost of material and production equals 10s., and wages 10s., and the article sells for 19s., then the worker is overpaid; but these conditions rarely occur. Thus, neither the general rate of wages, nor the rate of any particular firm, can be taken as a standard of value to measure wages. Wages are a charge on cost of production, and are fixed in relation to selling prices and profits. Hence the employers who pay high wages either produce articles cheaper, or sell them above average prices. In no case is it possible for them to employ "overpaid" assistants.—I am, yours, &c., JOHN A. RANDALL.

To the EDITORS.

GENTLEMEN,—During the past few weeks a number of letters have appeared in your Correspondence columns on this not unimportant question. They were called forth in this way: In December last, you replied to a correspondent in the Answers column, who wrote to the effect that his firm required the services of a man who was capable of doing the work that any ordinary photographer up to his work should be capable of doing, and asking you to give him "some idea" of what salary should be paid for the work. Having in mind the present state of the photographic labour market, you replied that about three guineas a week would be a fair remuneration for such services. A fortnight afterwards, a correspondent, "Comyn," wrote, saying that "surely a mistake has been made as to the salary," adding that he worked for a City firm, doing similar work, from 10 o'clock to 5 o'clock, with no work on Saturdays, and received double the salary you suggested. In an append to the letter you congratulated the writer on the short hours he worked and the salary he received, and, at the same time, advising him not to relinquish his present engagement until he was sure of a better. Now, six guineas for a week of 35 hours—equal to nearly 3s. 8d. an hour—is not bad pay as things photographic go at the present time. That seems to be the general opinion of those who have written on the subject. That

some houses do pay their hands that have long been in their employ and proved their ability, high salaries—even beyond the actual market value—is certain, and they are wise in doing so to retain them. It is doubtless under these circumstances that your correspondent "Comyn" is paid the salary that seems to be the envy of so many. But that salary must not be taken to represent the general run of wages paid. The labour market, whether skilled or otherwise, is governed by supply and demand. It is to be wished, in photography, that the supply were less and the demand greater.—I am, yours, &c.,

January 19, 1901. AN EMPLOYER.

REVERSAL IN ECLIPSE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—It may be interesting to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, with reference to reversal in eclipse photography, that I made two exposures on the solar eclipse of May 28, 1900. The first was made at 3.35 p.m., and the second at 3.40 p.m. An exposure of 1-15 of a second was given to both, and, on developing the first, I obtained a beautiful result, the crescent being quite opaque, with no sign of halation or reversal; but on examining the second exposure (the plate being developed in the same way as the other), one was surprised to find, like Mr. Brenner, that the crescent had fixed out perfectly clear glass, and, as before, no reversal. One of the slides I exhibited at the Royal Photographic Society's Exhibition in my lecture in November, and referred to an account given in one of our papers that it was observed by one of our eminent astronomers that occasionally the presence of cloud gave rise to some very beautiful colour effects, the sun and its intermediate surroundings appearing of a rich red, which changed to orange, and, finally, to a brilliant white as the intervening layer thinned away, and at the moment of the red phase the exposure must have been given.—I am, yours, &c.,

J. COOPER ASHTON.

323A, High Holborn, January 16, 1901.

ANALOGY OF GELATINO-BROMIDE TO BICHROMATED GELATINE.

To the EDITORS.

GENTLEMEN,—In your Foreign News and Notes, a fortnight ago, you referred to some experiments of Herr Hans Spörl with stripping films from a chrome gelatine paper. From these experiments Herr Spörl concludes that the assumed tanning action of pyrogallic acid on gelatine, containing a silver salt, after exposure to light, is confirmed. But did this fact require confirmation? It was well established in this country twenty years ago by the late Mr. Leon Warnerke, who, in 1881, worked out, and patented, a practical process founded upon it. Mr. Warnerke's process is this: Paper is coated with gelatino-bromide of silver, a rather thick coating being used. The paper is then exposed in the camera and developed with pyrogallic acid in the ordinary way. When developed, it may or may not be fixed, as that is quite immaterial. The negative is squeegeed, face downward, on to a glass plate, or other support, just as if it were a piece of exposed carbon tissue. After resting for a time it is put into warm water, when, after a short time, the paper can be stripped off, and those portions of the gelatine that have not been influenced by light are washed away, leaving the image in relief precisely as in the case of an ordinary carbon picture. The reduced silver in this case forms the image, instead of the usual insoluble pigment in the carbon process. From this it will be seen that, in this country at least, there has been no doubt as to the tanning action of pyrogallic acid on the exposed gelatino-bromide of silver. In this process the inventor, as one modification of it, proposed to add an insoluble pigment to the emulsion, so that carbon enlargements could be made direct with a camera exposure. Although this process of Warnerke has many applications, it has not come into any general use. Indeed, it seems to have been quite neglected, overlooked, and forgotten, and so has the principle underlying it, as witness the communication just referred to. When Mr. Warnerke patented his process, he read a paper upon it, and demonstrated its working, before the Photographic Society of Great Britain —now the Royal. This paper, and a subsequent one upon it, will be found on pp. 266 and 330 of your volume for 1880.—I am, yours, &c.,

A. F. WHITWORTH.

January 19, 1901.

WEATHER FORECASTING.

To the EDITORS.

GENTLEMEN,—Several letters have appeared in the "Standard," in the last week or two, calling attention to the unreliability of the forecasts of the weather as issued daily from the Meteorological Office. In the first letter that appeared the writer, erroneously, surmised that the forecasts were issued by the Royal Meteorological Society, which was, of course, soon corrected. In this letter the writer asked and many have asked the same question in compiling the annual reports, what the terms "possible," "perhaps," "probable," &c., count amongst the successes? One correspondent asks this pertinent question, "Whose judgment settles the large proportion of successes which the Meteorological Office from time to time announces to an admiring public?" adding that "I cannot remember having ever seen a statement that any one outside the office takes part in calculating its successes. Am I wrong in inferring that some one in the office which issues the forecasts pronounces on their success?" The writer goes on to say, "If it be so, I submit that the publication of the percentages is likely to mislead a confiding public," and adds that, "if 'successes' are to be announced, they should be successes certified by an independent body." If this were done, one who reads the daily forecasts and notes how they are fulfilled, would be inclined to doubt if the successes would come out to the same total as they score in the annual reports of the Office. Amongst those to whom fairly accurate weather forecasts would be most valuable would be photographers, but few rely upon them. The Meteorological Office costs the country between £15,000 and £20,000 a year, and what value do we get for it in the shape of reliable forecasts?—I am, yours, &c.,

January 20, 1901. WEATHER PROPHET.

CROYDON CAMERA CLUB EXHIBITION.

To the EDITORS.

GENTLEMEN,—May I remind your readers that entry forms for the above are now ready, and will be sent on application? They should be returned to me by February 2.

We are now offering gold, silver, and bronze medals. The open classes include landscape, marine, figure studies, portraiture, architecture, lantern slides, and novelties. Pictures and slides entered for South London Exhibition will, if desired, be sent by us from our Exhibition direct to the South London Society.—I am, yours, &c.,

W. H. ROGERS Hon. Sec., Croydon Camera Club,

46, Bensham Manor-road, Thornton Heath. January 19, 1901.

RODINAL.

To the EDITORS.

GENTLEMEN,—I shall be glad if you, or any of your numerous readers, can tell me if rodinal developer is injurious to the skin, as I called on a brother developer the other day, who develops all his plates with it; in fact, rodinal is the only developer he uses, and his face appeared as if he had a bad attack of eczema, or some other skin disease; and, in conversation, I found has had a bad breaking-out on his face nearly ever since using the rodinal (nearly two years), and it has been thought by some that rodinal may be the cause.

I shall be glad to know the experience of other rodinal-users. Thanking you in anticipation, I am, yours, &c.,

OLD PHOTOGRAPHER.

[We at one time used rodinal somewhat freely, but without tracing any ill effects to it, and we do not remember to have heard of such a case as that described by our correspondent. EDS.]

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Mr. Ives, in his very kind answer to my request for some logical argument or experimental grounds upon which he bases his methods, takes the position that it may be better to modify his curves for bright, catchy results, but that his curves are, nevertheless, scientifically and practically accurate. I regret being unable to follow him, and, in the form of an article, am sending you one or two examples which can readily be experimentally demonstrated or put to camera tests.

Mr. Ives very properly asks me to publish our approved analysis curves. They are those utterly condemned by him; they consist of three bands, red, green, and violet respectively, whose full action are at the extreme ends of the spectrum, and in the green they are, in fact, substantially identical with the projection colours, and are in conformity with the teaching of Professor Clerk-Maxwell in 1862 (it should perhaps be mentioned here that Prof. Clerk-Maxwell did not use his colour curves for photographing natural objects, but the same filters that he used for projecting), and Monsieur Louis Ducos du Hauron in 1870.

In regard to the practical three-colour process operator, who has finally adopted Maxwell curve screens, his results must be very inaccurate, or perhaps he illuminates his room with three homogeneous beams of coloured light to view them, for even Mr. Ives admits that these are the very essence on which the successful use of Maxwell's curves depends. We have come into contact with a good number of the practical three-colour operators in this country, but never yet one who would work Mr. Ives's screens, and Mr. Alexander Tallent, whose book on tricolour photography has been so highly appreciated, has now also condemned them. THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 15, January 4, 1901.—I am, yours, &c.,

HOWARD FARMER.

Polytechnic Institution, 309, Regent-street, W.

[The article to which Mr. Farmer refers will appear in our next. EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

FLUTE.—We abolished the Exchange Column five years ago. An advertisement is your only course.

FORMULA FOR RETOUCHING MEDIUM.—"J. H." writes for a receipt for making retouching medium.—In reply: Pale resin, one part; oil of turpentine, one part; oil of lavender, two parts.

X.—We do not give recommendations of the nature asked for. But the first-named instrument had a very high reputation, and some of the best hand-camera work that we have seen was produced in it.

T. C. E.—An advertisement in the JOURNAL will be your best course. In the ALMANAC the principal German papers are mentioned. You might try one of them. Sorry we can give no more definite advice.

RECEIVED.—Inquirer; B. C. B.; A Frequent User of the Process; Tenant; Enlarger; Aug. Wheeler; Portable; Walter Barrett; Moss; Opaque; A. F. Mack; H. Mason; South Wales; and many others. These in our next.

DIAZOTYPE PROCESS.—J. CLARE writes: "Can you tell me if the diazotype process of producing photographs on textile fabrics is patented or not, as I wish to make some pictures on silk by it?"—In reply: The process was protected by patent, but whether the patent, which was taken out several years ago, still exists, we are unable to say, though we surmise it is not. You can ascertain at the Patent Office.

RESTORING A FADED GELATINO-CHLORIDE IMAGE.—C. H. EVANS writes: "Can you tell me of any method of restoring the image in a very much faded gelatino-chloride print? It would not matter how temporary the renewed image would be."—In reply: We can only suggest that you try the method devised for restoring the image of faded negatives by Sir William Crookes, which will be found on page 2 of our issue for the 4th inst.

STALE PLATE TROUBLES.—"W. S. J."—In reply: The negative shows that it was taken on a very stale plate, and the discoloured film is in no way the fault of the photographer to whom you sent the plates to be developed. Therefore, it is not surprising that he should repudiate your claim for damages. If you refuse to pay him for his work, he can sue you in the County Court and recover. No one could make good negatives on such plates.

PHOTOGRAPHY IN SOUTH AFRICA.—"EMIGRANT" writes: "Can you give me any idea as to what prospect I, as a first-class operator age 26), would have in South Africa, and where would be the best place to go to?"—In reply: From what we have heard, the prospect would be good. But it would be quite useless for any one to go there at present. Wait till things get more settled than they are now, or are likely to be for some little time to come, we fear. Any of the large towns.

WASHING TROUGH; FIXING TRAY.—R. MCALISTER asks: "1. If a small domestic washing tray, if it is coated inside and out with Aspinall's enamel, will do for washing prints in. 2. If the zinc tray he uses for developing carbon pictures in will answer for the hypo solution for fixing silver prints in?"—In reply: 1. Yes, it will do very well. 2. No, because the hypo would soon destroy the zinc, and the prints would probably be stained if they came in contact with the metal.

COPYRIGHT.—"SENLIM" writes: "Will you kindly let me know if I should be justified and quite right in copying photographs from view books for a customer of mine? Does the law of copyright debar me from copying and selling only one copy? I do not wish to exhibit the same for sale or to do more than one copy. I have repeatedly refused to do this, but, not being quite clear on the matter, I would esteem your advice a favour."—In reply: If the originals are copyright, you run the risk, in making copies of them, of an action for infringement."

FUMES FROM LAMP.—G. E. CROSS says: "The lamp (three-wick) in a ——'s lantern I have smokes and smells most offensively when burning. Is there anything I can add to the kerosine oil that will prevent it? I have heard that camphor will prevent the smoke. Is that so?"—In reply: If the wicks are carefully kept in order, and the outside of the lamp is kept free from stale oil, there should be neither smoke nor smell, provided the air passages to the wicks are kept clear. The addition of camphor to the oil is said to be an improvement, but we have never found it, or any other addition, necessary when the above precautions are attended to.

TRADE OR PROFESSION?—E. SMITH writes: "I have been asked by a county auditor for the information if photographers class under the head of professionals or trade. I should be much obliged if you would kindly give me your opinion."—In reply: We should classify photographers as tradesmen. Sorry we cannot reply by post.

PHOTOGRAPHS OF FROST CRYSTALS.—G. B. RODGER writes: "Would you kindly inform me where good samples of frost crystals, photographed, are to be had? I fancy I have read several articles in THE BRITISH JOURNAL OF PHOTOGRAPHY from time to time, but have forgotten."—In reply: As prints, we know of no source for these photographs; but as lantern slides they are fairly common. Messrs. Newton, Fleet-street, and other optical lantern houses would, no doubt, be able to supply them.

SEPIA BROMIDE PAPER, &c.—"TASTE" writes: "Could you oblige me by telling me of a firm who supplies sepia bromide paper other than ——'s, which is as difficult to work as carbon? Also, where I can get transferrotype paper that is used to make window and glass door transparencies? I cannot find either in any of the leading firms' catalogues."—In reply: Sepia colours can be obtained on papers of the velox and gravura type by simple development. The Eastman Company used to supply the transferrotype paper, and we think it is still supplied. Write to the Kodak Company.

COLLODION FOR THE WET PROCESS.—G. K. WILLS says: "I wish to go in for taking ferrotypes by the wet collodion process, and should like to know if the ordinary enamel collodion is the right thing to use, if it is iodised; and, if so, please tell me how to iodise it?"—In reply: The ordinary enamel collodion is not suited for the purpose. Formulæ for the collodion and iodiser are given on page 1074 of the ALMANAC. But, as you are a beginner in the work, we should recommend you to purchase the collodion ready-made. By doing so you will ensure having the right thing, and much depends upon the collodion.

NEW METHODS OF INTENSIFICATION.—"T. S. M. W." writes: "Will you kindly let me know if I can obtain a copy of the report on the paper read by Mr. Bothamley at the Royal Photographic Society on January 8 on "Some New Methods of Intensification?" Although you say it is "not practicable to convey adequately the lecturer's conclusions without the slides," &c., &c., I should much like to know what he said about the two intensifiers and the two reducers."—In reply: Mr. Bothamley's paper will, no doubt, be published in full in an early number of the Society's "Journal." The Secretary, 66, Russell-square, W.C., will supply a copy for a shilling, plus postage.

WATERPROOF ADHESIVES.—N. N. MOSDITCHION writes: "1. Will you kindly give me the address of the best technical and scientific journal of England? 2. Will you kindly give me also some formula about the strongest and waterproof adhesives, to stick a piece of caoutchouc on another piece of caoutchouc, and to stick pieces of leather together?"—In reply: 1. "Nature," published by Macmillan and Co. 2. Coat the two surfaces of the caoutchouc with indiarubber solution, let the solvent evaporate, and then press them closely together. For sticking leather we know of nothing better than Prout's elastic glue. It may be had at most dealers' in shoemakers' materials.

FLASHLIGHT WORK.—"FLASHLIGHT" writes: "1. Having to photograph a group in a large ball-room, would it be possible to do so, as sketch enclosed, by using flashlight cartridges without having to use a lamp? If so, how many cartridges would it require for a group of 50 persons? 2. Where can I obtain the flashlight cartridges? 3. Would the Thornton film be suitable for the purpose? 4. Would the gas (incandescent lights) required to be turned out?"—In reply: 1. Yes. The number of cartridges would depend very much upon the distance they are from the group. We should recommend you to make one or two trials before the night of the ball, so as to make sure of success. 2. Messrs. Fuerst Bros., 17, Philpot-lane, E.C., supply the cartridges. 3. We presume so. 4. We should extinguish the two lights in front of the group.

PYROXYLINE.—"A TWENTY YEARS' SUBSCRIBER" writes: "I shall be very grateful if you can tell me where I can obtain a pyroxyline suitable for collodio-bromide washed emulsion. For many years I have worked this process with success, but this last four months I have made five or six batches of emulsion, and cannot obtain density or get a warm, pleasing tone. I recently bought some of Hopkins and Williams's soluble pyroxyline, not high temperature, and have made three batches with it, and each lot was quite unsatisfactory. I have now just made two more lots with some of Rouch's cotton, which I have had for about two years. This is not now satisfactory, although it worked well when first bought. I made the emulsion as recommended by Mr. W. B. Bolton, i.e., to emulsify in two-thirds of the collodion bromide and stand for half-hour, then add the remainder of the bromide collodion; but I do not now get the tones I used to get. I have difficulty to obtain density. The emulsion when made is a deep orange ruby, showing that the emulsification is all right, and I dry thoroughly before washing. I aim at obtaining warm tones and ample density. If you can kindly help me I shall feel greatly obliged."—In reply: Hopkins and Williams's high temperature cotton would be better. Why not get a newer sample of Rouch's cotton that has not deteriorated by keeping, as it worked well in your hands? Schering's celloidin is very good for emulsion work. You might give that a trial.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

The Last Photograph of the Queen. In time to come the world will look with profound interest upon the very last photograph that was taken of the Great Queen at whose bier mankind at this moment kneels in sorrow. By the courtesy of Messrs. Hughes and Mullins, the well-known Royal Photographers, of Ryde, Isle of Wight, we are able to indicate the occasion when her late Majesty last honoured a photographer with a sitting. In August, 1900, the Queen, with the children of the Duke and Duchess of York, was photographed at Osborne by Mr. Mullins, and that the photograph of Her Majesty in this group was the last taken of her is certified by Princess Henry of Battenberg, who caused the following letter to be written to Mr. Mullins on the subject: "Osborne. Miss Minnie Cochrane is desired by Princess Henry of Battenberg to inform Mr. Mullins, in answer to his question, regarding the latest portrait of Her Majesty Queen Victoria, that those Mr. Mullins took of Her Majesty and the Royal Family at Osborne in August, 1900, were the last sittings Her Majesty gave to any photographers. January 25, 1901."

Pigmentary and Trichromatic Photography. A great part of this week's Supplement to the Journal is occupied by a reprint of the late Mr. M. Carey Lea's valuable paper on silver photo-chloride, the reactions of which beautiful salt were believed by him to have some bearing on the problem of direct or pigmentary colour-photography. We hope that the paper may stimulate experiment in this neglected field of work. The reprint is made from the volume of the Journal for 1887, but its original source was the "American Journal of Science," to which admirable review we now, as on the former occasion, own acknowledgment for Carey Lea's paper. Another article of striking interest in connexion with trichromatic photography also appears in this week's Journal. It is from the pen of Mr. E. Howard Farmer, the well-known principal of the Polytechnic School of Photography. Passing over the points of controversy between Mr. Farmer, Mr. A. A. K. Tallent, and Mr. Ives, the paper in question is especially notable for the fact that it includes a set of colour curves, or spectrum records, worked out at the Polytechnic by Mr. Guy Simmons, which Mr. Farmer tells us are in actual use by trichromatic printers. This is a point of some practical importance, as a perusal of Mr. Farmer's paper, and the letters by which it has been preceded, will show.

* * *

A Novel Copyright Question. In the King's Bench Division, on Friday last, an action was brought against the proprietors of the People's Palace, Bristol, to recover damages in respect of an alleged breach of contract. Briefly, the case, as put by the plaintiff's counsel, was this: The plaintiff hired the hall in April last for a Sunday sacred concert and lecture on the war, illustrated with photographs and living pictures, and he engaged artists for the sacred concert and made all the necessary arrangements. When the plaintiff got to Bristol, he was told that the defendants declined to allow him to deliver the lecture, on the ground that some of the photographs to be exhibited had infringed the copyright which Mr. F. Villiers, the well-known war correspondent, had in them. The plaintiff explained that he had the right to use the pictures, eleven of which had

appeared in the "Illustrated London News." The proprietors of that periodical had given Messrs. Newton, the well-known opticians, of Fleet-street, the right to reproduce the pictures. The plaintiff, under examination, said that Messrs. Newton had told him that they had a perfect right to sell him the slides, which he purchased and exhibited at the Crystal Palace and elsewhere. In the end, at the suggestion of the learned Judge, counsel had a consultation, with the result that judgment was entered for the plaintiff for £20, the amount of his out-of-pocket expenses, and costs. This, Mr. Justice Mathew remarked, was a very proper ending of the case. No doubt, to the parties immediately interested in it, but is it equally so to others? For example, if one purchases slides of copyright subjects from those who have been given the right to publish them, have they the right to exhibit them at public entertainments or as illustrations at lectures? In the music trade the purchase of a copy of the piece does not, in all cases, entitle the purchaser to sing it at concerts. Does this apply to lantern slides? If so, it is an important point, and one that we do not remember has been raised before. The settlement of the case just referred to does not enlighten us much on the subject.

* * *

The Queen's Death and Photographic Business. How will the death of the Queen affect the photographic business? is a question we have several times since the demise of Her Majesty heard asked amongst professional portraitists. A year's mourning is a serious matter. To drapers and the like, who hold large stocks of light spring and summer goods, the outlook is by no means bright. But how will photographers be affected? In fashionable circles ladies, for some months to come, will possibly not care to circulate portraits of themselves taken in light-coloured garments and printed from existing negatives. Will they have fresh portraits taken in black or dark dresses? If so, it will benefit portraitists rather than otherwise. If, on the other hand, they delay giving away their portraits until the mourning is laid aside, it will very materially affect the profession. Many ladies now have a great objection to be photographed in black attire. At one time, in the early days of photography, it was thought imperative for a good picture to be obtained that the sitter should be in black or dark apparel. That idea has long ceased to exist, partly, perhaps, through the gelatine process, by which details in the lights of costumes are better rendered than was usually the case with wet collodion. It is probable that, in some quarters, there will for a time be a falling off in orders for prints from existing negatives. But it is possible that this may be more than compensated for by fresh sittings in the present style and colour of dresses to be worn through the year's mourning.

* * *

Portrait of the Queen Wanted. In a long letter, published one day last week, Mr. Frederick Wedmore says that it will be a matter for profound regret that "throughout a reign of three-and-sixty years—although there exists many an interesting and amiable record—there has been painted no portrait of the Queen which, by common consent of properly qualified people, represents, with comprehensiveness and absolute justice, her countenance and character." He then proceeds to criticise the work of various artists who have painted, from time to time, portraits of her late Majesty. At the conclusion of his letter, he remarks: "To me the names of Velasquez, Holbein, Rembrandt, Gainsborough are the names that occur as those of men who, could they but have been with us to portray the Queen in her weighty and glorious age, might have performed, not quite inadequately, their subtle task." This, of course, is only Mr. Wedmore's opinion, with which all may not agree. Notwithstanding his ideas as to the merits or demerits of the painted portraits of the Queen, there is no question as to the satisfactory nature of her photographs. The Queen liked "actuality," and that is, perhaps, why she patronised photography so much. Referring to the photographs, it is amusing to note the difference in the likenesses as reproduced in the various illustrated papers from the same originals. Except for the positions and the surroundings, it would be difficult in some instances to imagine that it was the same individual who was the original of these reproductions.

* * *

The Royal Warrant-holders. Within the last week or two we have received communications from professional readers who are evidently under the impression that the honour of having taken the portrait of a Royal personage furnishes sufficient title for the display of the Royal Arms over a shop front or upon stationery and mounts. This is not the case. We notice that one of our daily contemporaries makes a reference to a once widespread misapprehension on the point, which will bear quotation here for the benefit of many photographers concerned in this delicate matter. It points out that "Prior to 1883 it was considered that any tradesman who had at any time supplied the Queen with goods was entitled to exhibit the Royal Arms at his shop, and have them printed on his business stationery. In that year, however, a clause in the Trade Marks Act restricted the privilege to those who hold a proper warrant from the several authorities of the Queen's Household, and rendered the exhibition of the Royal Arms by persons not holding these warrants an offence punishable by fine. The effect of the Act was greatly to reduce the number of tradesmen advertising their patronage by Royalty, and consequently an increase in its business value. The number of warrants held is at present considerably over 1000. The majority of them, of course, are possessed by London tradesmen, Windsor comes next, and afterwards Edinburgh and Dublin. A few are held by tradesmen at Biarritz, Florence, and Nice." It may be well to point out that there is in existence an Association of Royal Warrant Holders, which defends the rights of its members against the aggressive assumption of the Royal Arms by tradesmen not entitled to the privilege.

DULL WEATHER DIFFICULTIES.

PLENTY of orders to execute, and only dull light to do them in! This, no doubt, is the experience of a very large number of photographers throughout the length and breadth of the United Kingdom. With those whose business lies chiefly in portraiture under good studio roofs and lighting, and who know what it is to cater for a fastidious public, the winter is always a trying, anxious time, even although

ıe professional brings to his aid a well-appointed system artificial lighting and resorts to many now well-known ethods of providing proofs against time when this is neces- ry to satisfy an unreasonable and thoughtless curiosity on .e part of his customers. There is, however, a much ider field than that of portraiture, in which it may be id that a professional is often driven to his wits' end to ıow how to act in the midst of the gloom of winter. The ıeral outside worker is often required to execute orders, ıch as at public functions, where any delay or postpone- ent is quite out of the question, and where he is face face with the alternative, that he must do something or ıse disappointment to his customers. In press work this particularly the case, and where is the photographer who ıs not experienced the difficulty of working under the ost unsuitable conditions of weather, where, if left to his vn judgment, he would never for a moment dream of aking an exposure?

The general public nowadays hears so much about photo- aphy that a very large number of people have come to elieve that anything is possible with a dry-plate and snap- ıot camera, and it is just here where it may be truly said ıat a little knowledge is a dangerous thing. With the pro- ssional, it matters not in which particular branch of photo- aphy he professes to excel; if there is one thing more than ıother that he tries to zealously guard, it is his reputation r turning out good work. As an advertising medium ıere is nothing in the world to compare with photography. good or bad photograph in the course of a few days or ours passes through a large number of hands, and is sub- cted to much criticism on the part of the public, who never r a moment bestow any thought upon the difficulties that ay have beset the photographer in producing the same. on the face of things the picture be poor, or even only iddling, the poor photographer's reputation is at stake, ıd the very charitable connoisseur, knowing nothing of e conditions under which it was executed, never hesi- tes to give it as his opinion that So-and-So (who, very kely, is a particular friend) would have made a better job it than the name which appears on the back. There is ıch a thing as reputation in photography; and, no doubt, ıe best and, in fact, the only means for a professional to ıard against unjust criticism is to refuse the execution of ıch orders as are placed before him under conditions quite ısuitable to good work. Unfortunately, it takes a strong ill to act in this manner, for the desire to please one's ıstomers is always present with the man who is alive to the ct that very often, if he refuses to operate, somebody else ill, and this often leads one to attempt work which re- lts in loss of material as well as reputation. It is, on the her hand, quite true that the world is not entirely com- sed of unreasonable people, for there are those who know at one of the first essentials in photography is good light, d, when they are brought face to face with unsuitable nditions for having their orders executed, they seldom sitate, when at all possible, to postpone the work. But en, again, there is a further pitfall to the poor photo- apher in the shape of being required to operate in what emingly appears to be as good a light as can be expected this season of the year, and it is just here that a photo- apher's reputation is likely to suffer most, if he does not t firmly on his own judgment and experience, operating ly in cases where delay is impossible, and in all instances, when this can be arranged, exposing under the best possible conditions for the particular subject on hand.

In dealing with work that cannot be postponed, such as groups at marriage parties and other similar inside subjects, where only a poor light is at command, an operator who knows his business may very probably employ a conjunction of daylight and artificial light, where the surroundings are such as will permit of this being done. Quite recently a photographer of our acquaintance was called upon to execute an order under somewhat trying conditions as to lighting. In this case it was desired to photograph a number of figures in a large swimming bath, the figures to appear, in regard to posing, as if they were receiving instructions from a teacher in the art of swimming. The light outside the bath was what, for the month of November, might be termed good, that is to say, what little sun there was seemed just to penetrate through a slight haze of atmosphere sufficiently strong to throw shadows on the pavement, but inside the light was decidedly too poor to permit of anything like an extremely rapid exposure being given, and, seeing there were swimmers in the bath, several of whom were thrown into what is termed a floating attitude, with outstretched hands and arms, as if in the act of striking out to swim, the difficulty at once became apparent of how to show such figures free of movement. Before attempting the work what may be termed a council of war was held with all those who were to take part in the operation, for without such nothing but confusion would have reigned when the swimmers were in the bath. The master or teacher selected the most expert as those most likely to remain steady in some particular attitude for the greatest length of time, and a couple of practice lessons were gone through a few days before the photograph was taken, the main figure being the teacher in the act of giving instructions to a pupil by means of what is termed a suspension belt. The bath was about fifty feet in length, and, as has been stated, the lighting was quite out of the question for shutter exposures, several of the figures (of which there were about twenty in all) being at a considerable distance from the camera at the far end of the bath, in the water. When it was seen that there was a fair chance of the selected boys keeping steady for a few seconds in the attitudes allotted to them, which was ascertained previously at the trials, arrangements were made for taking the picture at noon on the following day. The camera (a 12 × 10) was erected on a firm table at one end of the bath, so that the lens (a mid-angle), working at about f-11 of angular aperture, was used. Thus the entire figures were embraced in the view, and an extremely rapid plate, said to be over 300 H. and D., was placed ready in the dark slide in the camera, the shutter drawn, and the lens capped. This done, an assistant in the meantime stood ready with a powerful flash lamp at a point outside the view of the lens, who at the word of command did his part of the work to perfection.

Everything being ready, the signal agreed upon (a shrill whistle) was blown. In a moment it was seen that success would crown the efforts that had been bestowed, for the boys kept as steady as a rock. Off went the cap, ten seconds steadily counted, and then, "Now, Tom!" and a sudden blaze of beautiful light overtopped the weak daylight, lighting up the darkest corners nicely; on went the cap, and "Thank you, boys," resounded through the bath. On development, "Just right!" was the gratifying call from in-

side the dark room, and what must be termed a somewhat difficult feat in photography performed in the month of November. Our readers may be interested to learn something about the quantity of magnesium powder that was burned in aiding the poor daylight at command and the means employed for burning the same. In undertaking work of this kind, where a considerable space has to be dealt with, such as halls or baths of over fifty feet in length, a mere toy flash lamp burning only a few grains of powder is of no use whatever. The apparatus used was the well-known tobacco-pipe combination, described in THE BRITISH JOURNAL OF PHOTOGRAPHY some time ago, by means of which an enormous flood of light is produced, the illumination depending upon the number of pipes employed and the quantity of powder with which such are charged. This form of flash lamp is at once the simplest and most effectual in working that the photographer in question has ever used, with a battery of, say, six or eight pipes and a quantity of about one half-ounce of dry magnesium. The whole of the powder is ignited at the same moment of time, and a light of almost incomprehensible intensity produced. Where exacting work has to be performed in the dull winter season, it is only by such means that successful results can be obtained in many inside situations, whilst for such orders as are outside, and the weather conditions absolutely hopeless, as is often the case where deep haze or fog is present, if a photographer values his reputation he will refrain from operating at all, for there are always those ready to pass uncharitable remarks upon other people's work without knowing the difficulties which had to be contended with.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

TOWARDS dusk, one foggy afternoon in Paris, and as the newsvendors were running in every direction shouting "La Française," "La Française!" I said good-bye to Monsieur Louis Ducos du Hauron at his residence, 27, Rue des Batignolles, and went my way, pondering on the above subject, and trying to pierce the veil of the great differences between correct practice and the precepts which have been so widely disseminated, and which reached their culminating point in the Traill Taylor Memorial Lecture of November 21 last.

In this latter, Mr. Frederick Ives, of Philadelphia, claimed to have enunciated the correct optical methods upon which tricolour photography is, or should be, based, and that not only had he been fighting for the acceptance of these methods among practical workers during many years past, but that the great progress which has recently been made is due to the gradual recognition of these correct methods, as enunciated by him, and that the correctness of his views and work had been substantiated by a specially appointed committee of scientific experts in America, and are now supported by the highest scientific authorities in this country, and to some extent also on the Continent.

The acceptance of Mr. Ives's methods involves the assumption, that the early workers, the fathers, so to speak, of tricolour photography, including Professor Clerk-Maxwell, Monsieur Ducos du Hauron, and Charles Cros, Professor Vogel, and others, are all in error in their writings and work, and, in Mr. Ives's own words, his has been the work of clearing away the rubbish, and removing the lumber of ignorance and misconceptions with which these men left the subject encumbered.

With the exception of Monsieur Louis Ducos du Hauron, the celebrated men referred to are now no longer with us, and it was this gentleman from whom I had just parted. The undoubted inventor of trichromatic photography as applied to pure photography; of trichromatic photography as applied to printing processes; of the photo-chromoscope and melanoscope; the Macdonough and Jo processes, and many other things.

An old gentleman with a very fine head, with a remarkab resemblance to Mr. Ives, and with the same signs of great ment activity, his photograph published some time ago in the *Photogra* utterly fails to do him justice, as is so often the case with ind viduals in whom intellect and expression are the characteristics. is not, however, the intention, in this article, to describe a visit Monsieur Ducos, he simply adheres to his published works, which a voluminous, and the interview is only referred to as showing that, a far as it is possible to do so, the views of the one man still living, wh above all others is entitled to be heard on the subject, have bee ascertained, and to publicly apologise for the injustice hitherto do to him in our teaching here at the Polytechnic, through neglect i studying his publications and writings. Right well (if taken i connexion with this subject) did the newsvendors to shout L Française! La Française!

It has remained for one of our Poly boys, Guy Symmons, who b his industry and enthusiasm has gathered together the practic evidence which, by showing the failures arising from working fal methods, has led to a clearer understanding of tricolour photograph and at the same time, I hope, lifted the slur from the names of gre men; for it is the object of this article to endeavour to show, as f as can be in a popular manner, that the methods indicated by the are correct, and that Mr. Ives's methods, in addition to being practical useless, are fundamentally and scientifically bad.

The main feature of Mr. Ives's teaching, stated in his own words, the following optical principle (Traill Taylor Lecture).

[To secure negatives of the required character, we must emplo colour-sensitive photographic plates, and filter the spectrum ra through suitable coloured mediums, testing by exposures in the phot spectrograph and modifying the colour filters until the density curv conform to Maxwell's colour curves. If you can obtain by phot graphy such a colour record of the spectrum, you can by the sam means obtain true colour records in photographs from nature an works of art; but, if the spectrum test in any way fails, no rea accuracy can be guaranteed or should be expected. Although ther are various methods of synthesis, positive (photo-chromoscopic) an negative (colour prints), the photographic record that is correct fo one is correct for the other. It may be taken as an axiom that th ability or inability to reproduce the spectrum itself credits or discredi any trichromatic process.]

We will suppose that we accept this plausible principle, and pr ceed to apply it in our laboratory or studio to the reproduction coloured objects, and in doing so will further assume that we have a

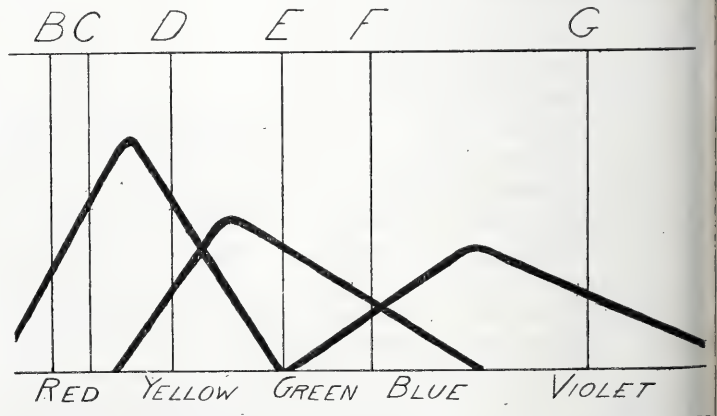


FIG. 1.—Diagrammatic illustration of Maxwell's curves. Also, according to M Ives, of the correct prismatic spectrum records for reproducing either (1) th spectrum or (2) the colour of natural objects by trichromatic printing.

our disposal perfect colour filters and plates and perfect printing inks in fact, everything in accordance with Mr. Ives's wishes. Let the firs example also be his test subject, the spectrum of white light, and tha in the first place it is to be reproduced in the kromskop. In this cas the Maxwell curves are substantially correct, for we must make ou negatives represent by their opacities the relative quantities of th three primary sensations required to reproduce all parts of th spectrum, in their proper hue and brightness, and, *as the amount o*

ch of the three primary sensations available is the same for the production of all hues, the hues which require the maximum nsation colour will form the high light in each negative, and all the her hues will be represented by proportionately less density.

But we now come to our second example, and will suppose it is quired to reproduce the same pure spectrum by the superposition three transparent pigments; in this case the colours for repro-ction will be yellow, carmine, and blue, or whatever approximation these Mr. Ives prefers. Now, please observe, the yellow pigment of ie reproduction will transmit a far greater quantity of the rays hich excite the primary sensation of red than will the red formed y the superposition of this same yellow and the carmine. Similarly ie blue pigment will transmit more of the rays which excite the nsation of violet than will the violet formed by the superposition this same blue and carmine.

These are two examples to illustrate *that we are not now using the me amount of each colour sensation for the reproduction of all hues* ee italics, example 1), but are dealing with a new problem, and one which *the relative luminosities of the colours in the reproduced pectrum are met by the mutual absorptions of the pigments;* these minosities have not, therefore, to be provided for in the negatives, nd he proper spectrum action will no longer be in accordance with Iaxwell's curves, but as in diagram 2.

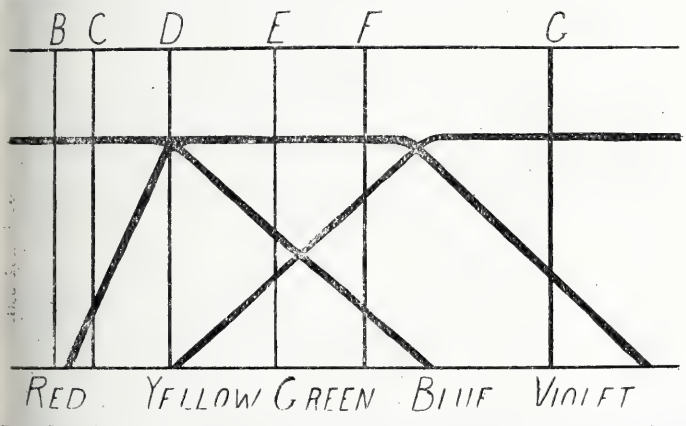


FIG. 2.—Diagrammatic illustration (Polytechnic School) of correct prismatic pectrum records for reproducing (1) the spectrum by trichromatic printing. Also the spectrum records obtained when photographing on painted (pigment) spectrum, nd using colour filters and plates to give prismatic spectrum records as in fig. 3.

If we attempt to print with the Maxwell curve negatives, nearly very part of the reproduction will be degraded in colour through the ntroduction of black; this latter point is now admitted by Mr. Ives THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 47, January 18, 1901;) s a matter of fact, Mr. Ives doubly degrades his greens, for, not satis-ed with printing carmine upon them and so blackening them, he, by is obstinate adhesion to Maxwell's curves, instead of the logical ntcome of his teaching the equally useless colour sensation curves, rints green in solid blue and solid yellow, instead of retaining a nsiderable proportion of white as is required for the green of the pectrum. Let us be perfectly clear on these points; the introduc-on of black is not required to retain the proper luminosities; on ie contrary, it destroys them, neither does it give any greater ccuracy of hue-rendering, on the contrary, it degrades them out f all recognition; the only way in which the Maxwell curve egatives could be made to give even decently correct reproductions ould be to illuminate the entire room in which they are viewed by ree bands of monochromatic light; a proceeding ridiculous in ractice and quite unnecessary.

Let us now take a third example, and assume we have a pigment pectrum (or any natural object) to reproduce by three transparent igments. We are now required to photograph, not homogeneous pectrum rays, but the colours of pigments, which are very ifferently constituted, and we are again dealing with a fresh roblem. We know that pigment hues from red to yellow usually eflect all the rays which red alone reflects, that pigment hues from ellow through yellow to green and from green, through green blues blue, reflect all the rays which green alone reflects, and that igment hues from blue to violet reflect the rays which violet alone does. We may now go further and say that the pigment hues from yellow to green as they get further from red reflect fewer of the red rays, that those from blue to green reflect less and less of the violet rays; and, lastly, those from yellow to red and blue to violet reflect less and less green, the outcome of this being that, if in a pure spectrum test with our plates and filters we get a band representing the red, the green, and the violet respectively, we obtain when photographing a pigment spectrum, or natural object, negative records correct for reproducing the same subject with pigments (see diagram 3).

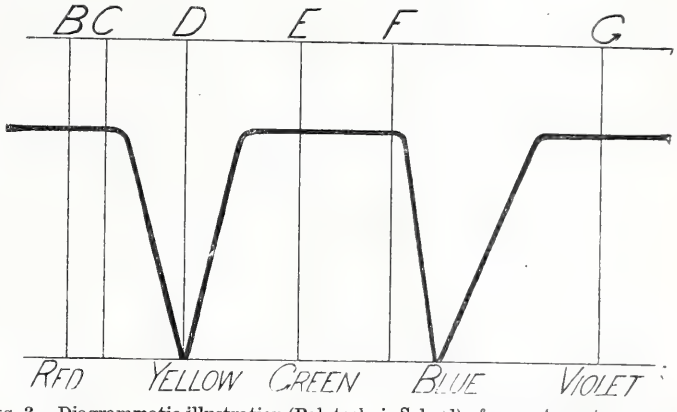


FIG. 3.—Diagrammatic illustration (Polytechnic School) of correct spectrum records for reproducing (2) the colours of natural objects by trichromatic printing, and confirmed by two years' continual practice. Also in substantial accord with the teaching of Ducos du Hauron and other early workers.

We have now three entirely distinct sets of spectrum records, each for the special example chosen; but, as we are concerned in practice with the reproduction of natural objects, which are similar in character to our pigment spectrum, we only require the one set of colour filters in accordance with diagram 3.

It will be seen that our spectrum records (diagram 3) are diametrically opposed to those of Mr. Ives (diagram 1), and that they fulfil none of his test conditions; they are, however, in substantial accord with the teaching of Prof. Clerk-Maxwell, of Messieurs Louis Ducos du Hauron and Charles Cros, of Professor Vogel, of Von Hübl and others.

They are substantially the same as the projection colours as used by Professor Clerk-Maxwell, and we find the actual filters employed by him in 1861 far better, both theoretically and practically, than those advocated by Mr. Ives in 1900.

Having considered one factor in colour printing which is, in itself, fatal to Mr. Ives's methods, and the subject being a complex one, I prefer in this article, to leave it at this stage, so that the principles enunciated may be refuted or confirmed by others without being complicated with other issues, such as colour curves for projecting, printing inks, &c.; there are, however, several other altered conditions in practice, when photographing natural objects, as compared with the spectrum, which are powerful factors in the case, and which are in themselves, in my opinion, quite sufficient to render Maxwell curve records useless.

HOWARD FARMER.

FOREIGN NEWS AND NOTES.

Red-sensitive Collodion Plates.—Dr. E. Valenta reports very favourably, in the *Photographische Correspondenz*, upon the value of ethyl-violet, as a colour sensitiser, which was obtained from the Badische Anilin und Sodafabriken, Ludwigshafen-a.-R. Although gelatine emulsions give poor results, collodion plates prepared with it work admirably. The following formula gives perfectly clean, vigorous negatives. 25 c. c. of a filtered alcoholic solution of ethyl-violet (1: 500) are added to a litre of collodion emulsion. After it has stood some time, filter through cotton-wool and coat the plates. Immerse the plates in a bath containing 2 to 3 grammes of silver nitrate per 1000 c. c. of water, acidified with 3 to 4 c. c. of acetic acid. Leave the plates in the bath until the solution flows off freely without forming tears. Well wash after exposure and develop with glycin,* diluting the solution with twelve parts of

* The following appears to be the formula:—Dissolve 25 grammes of sulphite of soda in 40 c. c. of hot water, to which add 10 grammes of glycin. Make the solution very hot and add 50 grammes of carbonate of potash in small quantities at a time. Bromide of potassium acts as a powerful restrainer.

water. The plates will be found very sensitive, the spectrum band extending from B to D ½ E, rapidly rising at C to a maximum at C ½ D. With a suitable red screen very good results may be obtained. A solution of tolanroth, obtainable from Kalle, of Bieberich-a.-R., is recommended as a red filter. This should be used in the proportion of 1 in from 350 to 1000 parts of water, the thickness of the filter being 1 c. At the strength of 1 in 350 it only transmits the red and yellowish-red rays.

Dr. Carl Grebe.—It is with deep regret that we see the notice of Dr. Carl Grebe's death in the *Photographische Chronik*. Born at Revel, March 8, 1868, he had scarcely attained the age of 33 years. His father was teacher of mathematics at the Cassel Secondary School, where his son was also educated. In 1889 Dr. Grebe went to Marburg University, and subsequently to Berlin-Charlottenburg, where he studied under Dr. H. W. Vogel. He obtained his degree in 1892, and then opened an institute at Cassel with his friend Worlitz for the study of scientific photography. This project was soon abandoned and after a short engagement with Messrs. Windscheid &. Ranf of Dresden, he went to the Royal Academy of Arts and Technical School at Leipzic, where he taught photo-mechanical processes. Count Vittorio Turati, of Milan, made his acquaintance there, and offered him an engagement, which he accepted. From 1895 to the autumn of 1898 a series of very interesting works from Dr. Grebe's pen appeared under Count Turati's name. Towards the end of 1898 he joined the staff of the Carl Zeiss Optical Works, and his last work on Light Filters, of which we recently published a translation, will be fresh in the memory of our readers.

An Interesting Competition.—Herr Wilhelm Knapp, of Halle-a.-S., the well-known publisher of German photographic literature, offers three prizes for the design for the cover of a book by Ludwig David, entitled *Ratgeber für Anfänger im Photographieren* (Adviser for Beginners in Photography). The following are the conditions:—1. The motive must refer to the use of photography, and be executed in the artistic poster style. 2. The pictures must be photographs from nature of at least cabinet size, and the prints must be sent mounted on card, not framed. 3. The process by which the prints are made is entirely at the option of the competitor. 4. The prints must not have been exhibited or otherwise published. 5. The prints must bear a motto, and be accompanied by a sealed envelope, bearing the motto and enclosing the name and address of the competitor. 6. The prints must be sent by March 31, 1901, to Wilhelm Knapp, Halle-a.-S., postage prepaid. 1st prize, 100M.; 2nd prize, 50M.; 3rd prize, 30M. The result of the competition will be published in the *Photographische Rundschau* for May. The right of publication of the successful pictures shall be the property of Wilhelm Knapp, who shall also have the option of purchasing for 20M. the right of publishing any of the unsuccessful pictures. All rejected pictures will be returned to the senders at the close of the competition.

A Caution to Users of Calcium Carbide.—In the *Deutsche Photographen Zeitung* an extract from Richard Lüder's *Patent and Technical Journal* is published, cautioning users of calcium carbide against injuries to the eyes and lungs. If the lumps of carbide are carelessly broken, particles may fly into the eyes or be inhaled. It is therefore desirable that the lumps should be first wrapped in a cloth, or some other precautionary means adopted. The moisture of the eyes and the mucus of the lungs decompose the carbide, producing quicklime. This causes great irritation, or even inflammation.

The Development of Gelatino-chloride Prints.—The *Photographische Chronik* reprints from Eder's *Jahrbuch* Dr. R. E. Liesegang's article upon this subject, and, as the development of prints is again attracting attention, we give an abstract of the process and the grounds upon which it is recommended. As the prints need only receive one-third of the ordinary exposure, the saving in time is very considerable, and the work of the printer in watching the frames is very much reduced. By development the gradation of the print may be controlled, either by reducing or increasing the contrast, and it is thus possible to obtain soft prints from hard negatives, or *vice versâ*. Tones may be obtained which are otherwise only possible in carbon printing, and they range from the ordinary photographic tone, through red-brown, to olive and greenish-black. If necessary, toning may be dispensed with. Finally, a print produced by development is more permanent than one printed in the customary way. From a study of the tones obtainable by development, it appears that th prints will fix out red if they remain too short a time in the gall acid bath. By continuing the development the tones will change t brown, and beyond this they will pass to olive and finally to th greenish-black stage. The less red the tone of prints, the less tonin will be necessary. Acid development is productive of redder ton than alkaline development, and, as gallic acid with addition of acetat of soda may be rendered alkaline, it is a very desirable developer f black-toned prints. If the prints are intended for prolonged develo ment, they must receive less exposure, and it may here be remarke that the softest prints are obtained by shortest exposure. It is ther fore preferable to use vigorous negatives if printing be cut down. will also be found that contrast is increased by reducing the quantit of developer. Brilliant prints are obtained by using the smalle quantity of solution, whilst further control is secured by using mor developer if soft prints are required. Dr. Liesegang prints from quarter to half ordinary depth, according to the results he wishes t obtain. Four dishes are placed side by side containing an aqueou saturated solution of gallic acid, pure water, a combined toning an fixing solution, and pure water respectively. The solution of galli acid should be used in a glass or porcelain dish, and it is desirabl that the temperature of this bath should not be quite cold. The prin should be first immersed in the gallic acid solution, carefully avoidin bubbles, which may be cleared away by drawing the print over th edge of the dish. Leave the print in the developer until it is of fu strength, but no longer. Rinse it in the second dish, then transfe it to the third dish containing the toning and fixing bath. If the ton is found satisfactory after the print has been five minutes in the bath it may be transferred to the fourth dish containing water. If the colou is too red, leave the print for a longer time in the toning and fixin bath. From five to ten prints may be developed in the same bath but fresh solution must be used as soon as the bath is too black fro precipitation of silver. To obtain greenish-black tones add a fe drops of saturated solution of acetate of soda to the gallic acid bath The black specks caused by precipitation of silver upon the print may be removed after fixation by means of a tuft of cotton-wool but this is more difficult after the prints have once been dried.

The Combined Bath.—Dr. E. Vogel, referring to the toning of collodio-chloride prints, remarks, in the *Photographische Mitthe lungen*, that the presence of acid and alum in the combined bath mus cause precipitation of sulphur, and render the permanence of th prints doubtful. The combined process is therefore discredited although this should not necessarily be the case. He confirm Valenta's statement that prints of considerable permanence may b obtained by using a bath containing hyposulphite of soda, nitrate o lead, and chloride of gold only, if the bath is not overworked. For litre of toning bath containing 50 c. c. of chloride of gold solutio (1 : 100), not more than eight to ten sheets of paper should be used It is best then to discard the bath.

Dr. E. Vogel has obtained very good results with the followin formula :—

Distilled water	1000 c. c.
Hyposulphite of soda.....	200 grammes.
Acetate of soda	20 „
Acetate of lead	15 „
Chloride of gold solution (1 : 100)	50 c. c.

This bath is alkaline, and, as it contains neither acid nor alum, it doe not precipitate sulphur. Sulphocyanide of ammonium is purposel omitted, as it has a tendency to double tones, the prints being con sequently liable to fade. The bath acts quickly, and violet and blue black tones are easily obtained. The above quantity is sufficient fo eight to ten sheets of collodio-chloride paper. If the prints are washed before toning, the bath will tone evenly, and the small quantity of citric acid present in the paper will be removed.

BIRDS'-NEST PHOTOGRAPHY.

[A Paper read before the Edinburgh Photographic Society.]

It has long been a greatly desired object among ornithologists to obtain correct representations of birds, their nests, eggs, young, but the efforts of the older school of artists and draughtsmen to produce these usually fell lamentably short of success. The ghastly atrocities in the shape of bird illustrations which disfigure the letterpress of many old classical works on ornithology are a permanent lesson in how things should not be done. Drawn only too evidently from wrongly stuffed specimens, by draughtsmen who had never seen the bird alive, they are preposterous caricatures. They resmble the originals merely in

the way that the wooden animals in a cheap Noah's Ark resemble their living prototypes.

Some of the drawings of the newer school of ornithological artists are a great contrast to these. Influenced, perhaps consciously or unconsciously, by the Japanese artists with their marvellous insight into nature, they are at once beautiful as pictures and wonderfully true. Those naturalists who have seen Mr. Thorburn's pictures do not require to be told they are "from life." It is in the drawing of nests and their surroundings, however, that artists fail most utterly; nor can I say, indeed, that the camera is entirely successful.

Probably the ideal illustrations of this class of subject would be produced by a number of photos taken by a photographer who was also a naturalist, combined and worked up into a drawing by a naturalist who was also an artist. This, however, is the ideal, and has not yet been carried into effect.

It is a matter of barely ten years or so ago since the camera began to be employed at all, usually in the portrayal of wild animals and birds in their native haunts. Those only who have attempted such work have any conception of the enormous difficulties to be encountered. Despite these difficulties, some really wonderful results have been obtained, partly, it is true, by chance, but largely by patience, perseverance, and skill.

Though not beset with such great difficulties, the photography of birds' nests, eggs, young, is often far from an easy task. There were a number of scattered birds'-nest photos in various publications previous to 1894, but it may be said that it was the publication in the "Photogram" for October and November, 1894, of photos illustrating two articles by Mr. R. B. Lodge, of Enfield (brother of the well-known bird illustrator, G. E. Lodge), that first drew the attention of the photographic public to the subject. In these articles an interesting account was given of Mr. Lodge's method of work. He had succeeded, with marvellous patience and skill, in obtaining some very good pictures of birds' nests with eggs and young, and, in some cases, of the birds themselves sitting on their eggs or feeding young.

The first book dealing exclusively with the subject—"British Birds' Nests," by Messrs. Kearton—was published the following year, 1895, by Cassell and Co. Since that date the Kearton have brought out a number of books on similar lines. Previous to the publication of the Kearton's first volume the issue of an *édition de luxe* of a book dealing with the subject by an Edinburgh ornithologist, Mr. Oswin Lee, was begun by David Douglas, the well-known natural history publisher of Edinburgh, and a large number of parts have now been issued. The title of this is, "Among British Birds in their Nesting Haunts, illustrated by the Camera." Recently a new author has appeared whose pictures are in some respects perhaps the best of any. This is Mr. A. G. Pike, whose "In Birdland with Field-Glass and Camera" has just come out this year past (1900). My acquaintance with the subject goes back to 1891, in which year I was given some photos of the nests of terns taken by a friend with a stand camera.

In the spring of 1893 I bought a ¼-plate camera of Baroness type, and started for myself. I now use almost invariably cut films. There is no doubt, however, that glass plates are the best, but in the case of a ½-plate camera their weight almost prohibits their employment for this class of work, for the whole outfit may have to be carried 12 or 14 hours at a stretch over perhaps the highest mountains in Britain, in search of the nests of some of the rarer alpine species of birds.

Non-photographers have sometimes curious ideas as to how nest photos are obtained. The idea of some is that the operator walks about with a Kodak in his pocket till he finds the desired nest, then he takes out his magic box, pushes the button, and hands the whole thing over to the "We do the rest" people, and "There's a picture for you." Photographers, of course, know how utterly absurd this is. For this class of work a stand camera is absolutely essential, and a snapshot camera utterly useless. The exposures necessary often run up not merely to seconds, but even to minutes, and the nest is often in such a position that the operator has enough to do to hold on himself after fixing the camera as well as he can, while he squeezes the ball of the time exposure shutter.

A year or two ago a good deal was heard with regard to the tele-photo lens for this class of photography, but after trial I have come to the conclusion that except in a few special cases tele-photo lenses are of no service. It is true Mr. R. B. Lodge has obtained some good results with a modified tele-photo of his own design, but, as a rule, he works, as do most, without any such device. The fatal drawbacks to the tele-photo are the great weight, difficulty of correct focussing, and the greatly lengthened exposure necessary increasing the chance of vibration. A shake, indeed, is one of the most frequent causes of failure, owing to the conditions under which many nest photos must necessarily be taken or not taken at all. These conditions may find the camera planted on the topmost boughs of some lofty tree on the quaggy bottom of some reedy lake, or precariously clinging to a very inadequate ledge of a dizzy cliff.

The best outfit for bird-nest photographs, if it is desired merely to take the nest and eggs, and not to attempt the higher flights at such restless sitters as birds themselves, is the simplest possible—a ¼ or ½-plate camera of light yet strong make, for it must often receive very severe usage, a shutter with time and instantaneous exposure, a good lens working from 8 feet, light yet rigid legs, and an adaptable stand. If a ¼-plate is used, the use of glass plates will not be found too burdensome; but, if the camera employed is a ½-plate, then cut films, while almost equal to glass plates, are very much lighter, more especially if employed in connection with special thin, light dark slides.

The camera I have been working with since 1896 is what is known as a ½-plate Royalty Pocket by Shew. This is an excellent little camera, and exceedingly light yet strong; it has the great drawback, however —one which renders it almost useless for the nests and eggs of small birds—of only possessing single extension. The shutter employed is a Thornton-Pickard detachable. Instead of a glass focussing screen, one of celluloid is used; this renders focussing more difficult, but, of course, renders the breakage of the focussing screen an impossibility. An accident of this kind, which in the case of a ½-plate camera might very easily occur, would prove exceedingly awkward and annoying. An unexposed cut film might be used as a makeshift, but these have a strong tendency to curl slightly, and therefore render the focus untrue.

There is one disadvantage in working with very light equipment, and that is the increased tendency to vibration. Various plans may be adopted to overcome this, where the position will admit of it building up the legs with stones, tying a weight to the screw of the stand, or, best of all, holding a focussing cloth or waterproof—I usually make the latter answer the former purpose in such a way as to keep off the wind as much as possible. In some positions, of course, nothing can be done but wait with as much patience as possible for a lull, and then, after all, maybe, the resulting picture, obtained perhaps with no little toil and difficulty, proves to be shaken.

Wind is the chief enemy of the birds'-nest photographer. Wind alone is bad, but when accompanied, as it very often is, by rain and snow, the unhappy naturalist photographer's task becomes an almost hopeless one. But in the months of March and April, when so many of our birds build, the weather is very changeable, and rain or snow must not deter the would-be nest camerist. I have seen a raven's nest, for instance, on an unusually exposed ledge which would have made a very interesting photo, the eggs lying in what appeared to be merely a wool-lined hollow in the snow.

Despite all drawbacks of wind and weather, and the failures which may be due to these, the pursuit of this branch of photography is, to one at least who is a naturalist first and a photographer after, a most interesting and fascinating study, and well worth the trouble involved.

HAROLD RAEBURN.

PHOTOGRAPHIC PRICES.

To the average person totally unacquainted with the science and practice of photography, it must seem peculiar why there should be such an enormous difference in the prices charged by different photographers for their work. Truly the difference in the quality of the work is apparent to the most casual observer; but, even allowing for that, on the face of it there does not seem to be all the difference suggested by the variation in price. We find C.D.V.'s quoted from 2s. 6d. per dozen to 12s. per dozen, and cabinets from 5s. per dozen to £1 10s. per dozen, and can quite understand the uninitiated thinking that, if one class pays at 2s. 6d. per dozen, those at 12s. must leave an enormous profit. This is partly true and partly not, because the work in the 2s. 6d. class cannot be properly done at the price, while with the 12s. class, although there is a big margin for profit, the expense to which the fashionable photographer is put to please his customers largely eats up the extra profit.

Let us take the case of a photographer commencing business, and a better idea can then be obtained of his expenses. In starting business a photographer requires a certain amount of plant, viz., a camera and fittings, or, more probably, two cameras, one for outdoor work and one for portraiture, besides plates, chemicals, printing-out and developing paper, enlarging apparatus, developing, toning, fixing, and washing dishes or tanks, mounts and mountants, printing frames, burnishers, squeegees, dark room and fittings, &c. His rent, rates, and taxes, with an extra charge for water (probably the latter may only average 2d. or 3d. per week, but when we are working with small profits every penny tells). Add to this a certain amount for advertising, including possibly a show-case with specimens, and it is seen that a fair outlay is incurred before one penny is earned. Then our photographer has to become known before he is likely to do much business, so that he must allow a few pounds more for dead loss before he can really make his receipts meet his expenses, let alone make a living. We may reckon that, on the average, C.D.V.'s will outnumber cabinets by at least four to one, therefore a photographer who produces them at 2s. 6d. and 5s. per dozen respectively has to turn out weekly six or seven dozen cabinets and 28 or 26 dozen C.D.V.'s to make a turnover of £5 weekly, and, presuming that 50 per cent. of this is clear profit, which is very doubtful, we cannot say that our photographer is overpaid, and it is small wonder that cheap photos fade quickly, as a photographer cannot

possibly give the proper time to their production when he has to work at such a cut-throat price.

We can imagine any one saying, "2s. 6d. per dozen is 2½d. each, that seems quite enough for a C.D.V.;" but, if we take the production of a photo from the beginning, perhaps even novices might change their opinion. First of all, there is the sensitised plate, which must be exposed for the sitter, removed from the camera, developed, fixed, washed and dried, placed in the printing frame, and twelve copies made from it, and then each copy must be toned, fixed, dried, and mounted. Often the plate requires to be retouched, sometimes only slightly, but, in the case of sitters being freckled, a considerable amount of retouching is required. Very often the prints require to be touched up slightly as well. This only represents the actual work to be done, besides which there is the plate, twelve pieces of printing-out paper, twelve mounts, developing, toning, fixing, and mounting solutions to be provided, besides the wear and tear upon the photographer's plant. He naturally wants a little profit, which is not likely to be very exorbitant.

It is perfectly natural that every one should wish to get photos as cheaply as possible, and to those people utterly ignorant of the business, to whom a photo seems little more than a piece of card, for, with a great deal of the most necessary work incurred in producing photos, little or nothing is shown for it, no doubt even 2s. 6d. per dozen seems a lot of money, and it is reasonable to expect that, where there is a demand for cheap photos, that demand will be supplied, and at the expense of the permanency of the photo. From a business point of view this may be all right, but, for the sake of photography and the profession, it is to be regretted.

It is almost impossible to produce good and reliable photos at a profit for less than 5s. per dozen C.D.V.'s and 10s. per dozen cabinets. At these prices very fair photos may sometimes be obtained, though, of course, not with the very best materials, workmanship, and finish.

Extravagant prices must be charged to those people who expect waiting and dressing rooms elaborately furnished and fitted up, with everything else in connection to correspond, and, even in a smaller way, it is really necessary to have a dressing room, unless the studio is made to do duty, and furnished with mirror, combs, brushes, &c., as people naturally want to look their best in a photo, which cannot be expected if hair and clothing are disarranged or the latter in creases. Even should the sitter not arrange these little details, a careful photographer would mention them, but, where a man has to turn out photos at 2s. 6d. per dozen, he has no time to trouble about details, for everything must be rushed through as quickly as possible, so that a little profit may be made. In this case all this materials must be of the cheapest, quantity standing before quality, except in using them, where quantity takes a back seat, being displaced by economy. If people are satisfied with photos produced under these conditions, it is quite right they should be supplied; but in most cases, although they are fairly well satisfied at first, when the photos begin to fade, as they usually do very quickly, grumbling is heard, and vows are made that they will not patronise this particular photographer again, so our poor photographer not only gets little profit from his work, but very likely no credit either.

In cases where it does not matter whether photos are permanent or not, a cheap photographer will do as well as a good one; but, if photos are wanted which will last a reasonable time, as in the case of faces, places, and incidents of which we should like a fairly permanent record, a fair price must be paid for the work.

Usually the higher-priced photographers expose two plates at each sitting, in case the first exposure is not satisfactory, and two proofs are submitted, which are sometimes given to the sitter, exclusive of the number ordered, this, of course, being an expense to which the cheap photographer is not put, as, should his proof (which, of course, is included in the number ordered) not be approved, and another sitting desired, extra money (usually 1s.) must be paid. So that, taking one thing with another, there is not really the great discrepancy in the prices which at first appears to exist. C. T. Sutton.

THE ECONOMIC USE OF PHOTOGRAPHIC APPLIANCES.

In applying the general principles of economics in two previous articles* to the management of photographic labour, more has been found in the actions of employers open to criticism than worthy of approval. With the subject now under review this is, happily, reversed. Photographers have always held most progressive ideas with respect to the commercial value, and general utility, of good apparatus, being, at all times, ready to discard old appliances in favour of the new that promised to give them better results or facilitate production. Cameras and lenses have, in consequence, been improved and brought to an almost perfect state of efficiency, and but little fault can be found with them as tools for the economic production of technically good photographs. The profession has never been influenced by the old saw that "a bad workman complains of his tools," and the deduction that the best workman is independent of the quality of his implements. No man can thus dissociate his labours from his tools. The poor workman achieves little either with good or bad tools, whilst given a competent hand it is only reasonable to conclude that with the best appliances alone will his energies be brought to their fullest fruition.

Tools are simply devices for aiding the senses and powers, enabling a human being to accomplish more work and of finer quality than by his natural faculties. All appliances are therefore labour-saving devices, cameras and lenses in particular saving the hand and mental labour involved in the older methods of pictorial representation. Every tool whatsoever should thus lighten the task of the worker, and, unless it does so, it cannot possess any economic value to an employer. Compare, for example, the old, heavy, box camera and its bulky lens with the modern lens and its diaphragm, the bellows body camera, and additions, swing and reversible back, rising front, extensions, &c., and an estimate can be formed of the time and labour saved in working the latter, meaning a considerable economy of labour power. A good test to apply in valuing the utility of any appliance is, consequently, that of its effect upon the worker, since, if it relieves him of tedious or irksome duties, it economises labour. Whether the labour of an employé is heavy or light is of no practical importance to an employer, he having simply to consider how wages balance against output. A hard-worked assistant is not necessarily creating a profit, but, on the contrary, the one who, aided by good apparatus and ingenious machines, produces the largest amount of commodities in the shortest time without fatigue and with the minimum expenditure of energy. A second test of the value of apparatus is, therefore, that with the same amount of labour it must enable a worker to produce more.

It follows, for these reasons, that good tools are not solely of value for the benefit of assistants, but chiefly for that of employers. It is a common notion to regard a sufficiency of tools as merely a convenience for employés, being a matter of indifference to employers. Such a conception is a fallacy, for the employer, needing the greatest possible output, can most easily secure it by adopting machines and inventions saving labour. The employer is firstly concerned with output, the worth of articles manufactured in relation to wages paid, and, secondly, with the labour of his workman. If, then, by saving labour he can increase his output, it becomes equivalent to a reduction in wages, cheapening the cost of production.

All apparatus must facilitate the duties of an assistant; if it retards his operations or puts upon him a strain beyond what is demanded to accomplish the work in hand, it ceases to be economical. For instance, it is a waste of labour and mechanical powers to use a 15×12 or 12×10 camera for smaller sizes, as in this case an implement is employed carrying a surplus of capacity needing to be moved and manipulated for results not equivalent to the energies expended. An appliance should accomplish precisely what is required, being excessive neither in size nor weight. Again, it is a common practice in printing to place cabinet negatives in whole-plate frames or quarter-plate in cabinet, which means a similar waste, firstly, with respect to the surplus of energy needed in manipulating them; secondly, in the loss of space in spreading them out to print. The double dark slide also illustrates this point, for, obviously, in this case three slides have the capacity of six of the old single form, resulting in a considerable saving of time and labour in using them.

Such small economies in cameras and lenses, combined with the gelatine dry plate, itself a labour-saving device, have exercised an immense influence on commercial photography, particularly on outdoor work. In the wet-plate days the photographer wishing to produce a 12×10 views was compelled to give a day to the task, involving much labour in preparations and the use of a portable dark room. Nowadays a similar task may be done in a few hours, all the outcome of bringing his appliances to bear more directly upon the business in hand. In some instances a mechanical aid is no improvement upon hand labour; it may be so complicated that the cost of working exceeds the profit made on its increased output, or the uncertainty of result and waste through failure may be much higher, detracting from its added powers of output. Exposure meters, hand cameras, exposure shutters, print trimmers, plate washers, and instruments for cutting circulars, prints, all suffer under one or the other of these disadvantages in comparison with the more simple methods of achieving similar ends. Again, the extra cost of a labour-saving device may outbalance its proved utility. Films in competition with glass as a support for the sensitive emulsion have this fault.

Whilst it is a sound policy to have at command an adequate supply of apparatus to economise labour and meet the calls of business, it must not be overlooked that all appliances not fully occupied mean so much capital locked up and producing no turnover, since, unless a machine is working, it represents a loss on the fixed capital invested. This often occurs in a new business, the plant being largely in excess of the needs of the concern, a proportion of the capital is thus idle. Like an employé, the utility of a machine is the amount of its output; when either are idle it means a loss, the one in wages, the other in capital. Beyond this, in dealing with an excess of tools or mechanical power, an account must be taken of the cost of keeping them in repair and losses by damage, &c. It is therefore advisable to limit the

* "British Journal of Photography," December 21, 1900, p. 809.

plant in use to the smallest consistent with the proper conduct of production.

To fully equip a photographic establishment on economic lines requires considerable capital, much more, in fact, than is laid out on many businesses which are started and continue to flourish. Beginning with so small an outlay, it would be thought that in these cases a large return in profits would be gained. But this does not occur, because the stinting in tools and appliances must be made good by an extra expenditure on labour power as wages. To make them pay, the principals of these small concerns give to them a surplus of labour, which, if engaged and paid for at the full market value, would swallow up all profits. It is simply this personal gratis labour which makes up the losses suffered through a deficiency of appliances and fittings. Another illustration of this close relation between labour and appliances is the well-known fact that the producers of cheap work, workers for the trade, enlargers, trade printers, always have better implements and workshops than those who produce the highest class of work, whilst these latter employ a larger number of hands in proportion to the quantity of work finished. This indicates, in the first place, that labour-saving tools are necessary to bring down the cost of production to the lowest figure, and, secondly, that they tend to reduce the number of workmen required. The machinery of manufacture is thus, under modern conditions, more important than the human factor, except where the highest quality of work is demanded, when the skill of the mechanic takes the first place, good appliances being then of secondary value. It, therefore, best serves the ends of this class of employer to pay the maximum in wages rather than make a large expenditure upon tools and fittings. Such a proceeding, however, does not serve to any great length, for it is found that when a business expands beyond what can be controlled by a single employer, and a large output of the best work is called for, then economic principles again rule, and the most effective mechanical aids are brought into use, with a proportionately smaller number of assistants engaged.

The conception of tools must be extended to include the fixtures and dimensions of photographic studio and workrooms, as these exercise a marked effect upon the amount of work executed and the promptness with which it is carried out. An adequate supply of sinks, dishes, benches, shelves, well arranged in the minimum space, must yield greater facilities for working than an insufficient supply of such necessaries. Too little attention has been given to this matter by professionals, and it would be of some value if designs for photographic studios and workrooms planned by men of experience were published and rendered easily accessible.

As a rule, the photographer's notion of a dark room is somewhat primitive, not rising above a cupboard or a box, stingy of space, being small, confined, stuffy, and meagrely fitted. A dark room is certainly a workroom, and should possess the dimensions of an ordinary room rather than those of a packing-case, which is characteristic of many. A well-arranged dark room is as needful as the latest pattern camera or the newest lens in the studio if production is to be conducted on the most economical lines.

In the printing room the same principle holds good. The more complete the conveniences for working the cheaper will be wages, cost of material, and working expenses in general. In many photographic businesses the printing department is starved, both for appliances and space. Oftentimes no provision is made for printing in wet weather, which must not only entail a loss in wages, but also through loss of trade arising from a lack of promptness in the despatch of orders.

These and similar cases of a false economy, insignificant as they seem, will mar the success of a business which might, if managed otherwise, be a profitable concern to employer and employed, for commercial failure can usually be traced to a neglect of apparently unimportant detail.

What has been here put forward in relation to tools and fittings can also be applied to studio accessories, which in the photographic profession must be included within this category.

JOHN A. RANDALL.

MR. IGNACE HERBST ON PHOTOGRAVURE.

AT the Camera Club's last meeting a very interesting lecture was delivered by Mr. Ignace Herbst, who took for his title "Photogravure and its Progress in England." The subject is one which is interesting to amateur as well as professional workers, for, although comparatively few can take up the practice of photogravure by reason of the time and attention necessary to master the art, it has so much fascination about it, and is capable of furnishing such magnificent results, that several have flirted with it.

Mr. Herbst commenced his remarks with an apology for his shortcomings with regard to the English tongue, but such an apology was quite unnecessary, for he made himself clearly understood by all present. He told his audience how he had worked at various processes of photographic reproduction, and how he had, on the Continent principally, gained much experience in photogravure. He had now established on a large scale works in London, and he had the satisfaction of saying that many orders came from abroad, and were now being carried out in the British metropolis by his firm. It was commonly believed that the best work in photogravure was impossible in England, and quite lately an English publisher visiting Paris took up some photogravures and deplored that such work could not be done in his own country, being ignorant of the fact that the very pictures he was then handling were the product of a London house.

After showing how the photogravure process required a metal plate, preferably copper, and how the image must be an intaglio one, Mr. Herbst exhibited the kind of negative from which the best results might be expected. This was of very large size, and was the copy of a painting; it exhibited all the gradations of tone, from high lights to deepest shadows. The plate employed was a gelatine one, made specially for him, but he sensitised it for colour before use. To get the best results he preferred to expose in sunlight, which was sometimes a difficult thing to accomplish in the atmosphere of London.

The negative is very carefully touched up and strengthened where required, and from it a carbon transparency is taken, which is also cared for by the retoucher. The lecturer showed such a transparency, and explained how the retouching was done with pencil, stump, and powdered graphite, and how extra clearness was given to certain portions of the plate by local varnishing. Next came a description of the preparation of the copper plate, its graining by aid of the dusting box and powdered bitumen, and the selection of a fine, coarse, or medium grain, according to the subject in hand. This choice of grain the lecturer considered one of the most important things attaching to the successful prosecution of the work.

After describing the manner in which the photographic image is transferred to the copper plate, the important operation of etching was fully gone into, and, by aid of a lantern slide, the action of the etching fluid on the metal was exhibited in exaggerated form. Three or four baths of iron perchloride were prepared, each of a different strength, and at a temperature which might range between 18 and 25 Celsius. The first of these baths would be the strongest, and would act on the shadow portions of the picture, the next on the half-tones, a third on the high lights, while a fourth bath could be so compounded as to bring the whole into harmony. Plates of metal in various stages were shown, and the operation of steel facing by means of the electric battery was described. The specimens of printed photogravures shown were of enormous size and of splendid quality; they aroused much admiration.

Mr. Herbst next showed some beautiful photogravures in colours, and briefly described how the process was carried out with the help of one metal plate only. The copper was first of all flowed over with a varnish-like fluid, the exact composition of which is only known to a few, and then the colours, in a dry state, are applied to the plate by hand. It is obvious that this requires skilled and artistic labour of a high quality, and that the process is necessarily very slow. Upon a large plate perhaps three men will be engaged in applying the pigments, and only two or three coloured impressions will be possible from that plate in one day. From smaller plates the output may run to a dozen a day, but it does not often exceed that. The main difference in a plate required for colour printing is that the etching must be carried deeper than is usual in a plate only required for black ink, for the colours used require a certain thickness to bring out the best effects.

An interesting, but all too short, discussion followed the reading of Mr. Herbst's paper, and several members of the Club showed that they knew a good deal about the process. General Waterhouse, who was in the chair, could, of course, teach most people all that is known concerning it, for he is in a measure responsible for the rearing of it. All the speakers agreed that photogravure was not to be learnt by description, and that success with it could only be gained by hard work and continuous application. There was really no secret about the process now, and, with regard to the introduction of colour, Goupil had shown years ago what beautiful things were possible in this direction.

The Chairman, in summing up the discussion, remarked upon the great advantages possessed by photogravure over such a process as collotype. In the latter the image was built up of gelatine, and would often perish before 100 copies had been pulled from it. But with an image in photogravure quite a thousand copies could be taken from a photo which had been steel-faced, and after that the facing could be renewed and another thousand prints made, and so on indefinitely. Another advantage of the process was the amount of retouching possible at various stages of the work. A most cordial vote of thanks to the lecturer concluded the proceedings.

THE GREENOCK CAMERA CLUB'S EXHIBITION.

THE first Annual Open Exhibition of the Greenock Camera Club, which is being held in the Museum Hall, Kelly-street, Greenock, was formally opened at an evening's conversazione by Mr. James Reid, M.P., on Monday, January 28.

By the kindness of the National Electric Wiring Company the Exhi-

bition is being specially lighted by electric arc lamps of 10,000 candle power. A very large entry has resulted, and, as lectures by such well-known local men as Mr. J. C. Oliver, ex-President, Glasgow and West of Scotland Photographic Association; Rev. John Crouch, President of the Paisley Photographic Society; George Dunlop, B.L., and W. D. Boyd (both of the Greenock Camera Club), illustrated by the lantern, and kinematograph exhibitions, have been arranged for each evening, a successful run is ensured.

The arrangements of the Exhibition have been well carried out and the hanging of the exhibits admirably done, while the framing and mounting of the exhibits, taken as a whole, has been done with considerable taste, and in some special instances the frames are superb and admirably adapted to exhibit the work to the fullest advantage. There are 100 exhibitors and nearly 500 frames.

In the Members' Section the pictures on the walls show that the Society maintains as high a standard of excellence (technically and artistically) as any of its West of Scotland neighbours, and that is saying a good deal. Altogether, the Exhibition is clearly and distinctly a corroboration of the opinion, so often expressed, that the pictorial aspect of photography is vastly on the increase among photographers generally.

The judges were W. Snell Anderson, F.R.P.S., Helensburgh; William Goodwin, Secretary, Glasgow and West of Scotland Association; and W. M. Warneuke, F.R.P.S., Glasgow. Messrs. Lizars, Glasgow, and Kodak, Ltd., have an excellent assortment of the numerous cameras they manufacture on view.

Below is the complete award list made by the judges:—

MEMBERS' SECTION.

Class A, Landscape or Seascape (any size): Silver medal, withheld; bronze medal, G. T. Poulter; commended, T. A. Cunningham. Class B, Architecture (any size): Silver medal, withheld; bronze medal, Geo. Dunlop. Class C, Portraiture (including groups and figure studies, any size): Silver medal, G. T. Poulter; bronze medal, Mrs. Fleming; commended, D. L. Murdoch. Class D, Enlargements (not less than full-plate size): Silver medal, J. E. Turner; bronze medal, Wm. Blair; commended, D. L. Murdoch. Class E, Hand-camera Work (in sets of six): Silver medal, Wm. Blair; bronze medal, Geo. Dunlop. Class F, Lantern Slides (in sets of six): Silver medal, Wm. Blair; bronze medal, Geo. Dunlop; commended, John McCaris. Class G, Beginners' Class (must have commenced since Janaury 1, 1899): Silver medal, Miss McCallum; bronze medal, withheld; commended, Miss Morrison.

OPEN SECTION.

Class H, Landscape, Seascape, or Architecture (any size): Silver medal, G. Bird, Bath; bronze medal, W. G. Buchanan, Glasgow; commended, Brown and Co., Helensburgh. Class I, Portraiture (including groups and figure studies): Silver medal, J. D. Ritchie, Paisley; bronze medal, A. S. Nicol, Perth; commended, J. G. Mainds, Glasgow. Class J, Enlargements (not less than full-plate): Silver medal, J. G. Mainds, Glasgow; bronze medal, J. G. Pratt, Greenwich; commended, G. S. Bryson, Pollokshields. Class K, any subject, any size, taken by Lizars' "Challenge": Silver medal, G. Bird, Bath; bronze medal, J. W. Comrie, Ardrossan; commended, R. K. Holmes, Dollan.

THE GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION'S ANNUAL EXHIBITION.

THE Annual Exhibition of this Society opened on Monday, January 28, and closes on Saturday, February 9. It is open free to the public, and the large attendance testifies to the general interest now being centered in photography. The Society's spacious rooms at 180, West Regent-street, show the pictures off to the best advantage, and the general quality of the work speaks eloquently on behalf of the members' artistic powers. The members of this Association passed a resolution two years ago to judge the pictures themselves and make the awards by popular vote. This method was again adopted this year. Without a doubt this method of judging is to be regretted, principally on account of the large amount of lottery that enters into it. It stands to reason that all the members are not past masters of the photographic craft, but, like similar societies, the majority have much to learn, so that it is quite evident that the awards are made by the incompetent majority. However, the whole Exhibition reflects great credit on all those who have in any way contributed toward achieving so successful a result. In the class A the awards are likely to be followed by the majority of spectators, and many of the winning prints will improve on closer acquaintance. Besides the winning pictures, those by Messrs. Allan, jun., Bryson, Primrose, and Kay should have some attention. The pictures which received recognition in the next class are those of Messrs. Halley and Reoch, to whom silver medals are awards. Both are good specimens of careful and skilful photography. Bronze medals go to Cameron Todd, for a beautiful fruit study, which has charming quality, and to J. C. Oliver's "Child Study," a model of technical excellence and possessed of some considerable quantity of artistic merit. Other pictures which deserve more than passing notice are those by Douglas, Burnie, Oliver, Finlay, and Goodwin. The outing class is very weak in numbers, and the successful print is by J. D. Downs, a rather commonplace subject, in which considerable skill has been employed to handle the sunlight, which is well rendered. J. Imrie Frazer's picture is very dainty and full of artistic feeling. Lantern slides are a strong point, and the silver medal has been won by Thos. Robertson for a fine series, perfect in technique and altogether well composed. Archibald Watson is awarded the bronze for a fine set of yachting slides. These show a good knowledge of technique and how to use it; very nice, clean work, which pleased us very much. G. S. Bryson and G. W. Buchanan have some exquisite slides, well deserving of distinction at the hands of the judges.

The following is the complete list of awards:—Class A (any subject, any size, not previously shown here): Silver medals, 3, Thomas Calder; 22, Jas. Douglas; 31, James Baillie; 35, J. R. Forrest; 44, W. G. Buchanan; 75, J. Imrie Frazer; bronze medals, 15, T. W. Robertson; 23, Cameron Todd; 26, J. W. Downs; 32, Edwin Grossman; 41, Prof. Findlay, M.D.; 110, J. C. Oliver. Class B (pictures previously shown, whether medalled or not): Silver medals, 149, Wm. J. B. Halley; 174, James W. Reoch; bronze medals, 182, J. C. Oliver; 147, Cameron Todd. Class C (pictures taken at the outdoor meetings of 1900): Bronze medal, John W. Downs. Class D (lantern slides in sets of six): Silver medal, 210, Thos. W. Robertson; bronze medal, 214, Archibald Watson.

Our Editorial Table.

DEUTSCHER PHOTOGRAPHEN-KALENDER, TASCHENBUCH UND ALMANACH FUR 1901.

Verlag der Deutschen Photographen-Zeitung, Weimar.

THIS handy little volume, issued in the form of a pocket-book, contains a valuable collection of formulæ, tables, and statistics, with much other interesting information. Its general usefulness will recommend it to every German professional photographer. We regret, however, that the tables of English weights and measures, to which we drew attention on a former occasion, still remain unrevised. We see, once again, 70 grains set down to the scruple, and ten pennyweights to the ounce, and the avoirdupois grain incorrectly described as equal to 0.05906 gramme. We also note that the Imperial quarter contains two comps, which is probably the phonetic way of spelling the English word Coomb, when heard on the banks of the Ilm. From our own point of view English weights and measures are difficult enough, but they must be utterly incomprehensible to the German photographer who trusts to such data.

CHROMATYPE PRINTING.

Agent: J. R. Gotz, 215, Shaftesbury-avenue, W.C.

MR. Gotz has submitted to us a number of prints on this paper; they resemble, in effect, the results obtainable by gum bichromate. Chromatype appeals to those photographers who appreciate a non-transfer carbon process which yields images having what is termed breadth of effect. It is, therefore, suitable for large work. The paper is supplied pigmented in a variety of colours. We condense from the descriptive circular the principal instructions relating to sensitising and the subsequent operations:—Sensitising: The proportions in which the normal sensitising solution is made up are as follows: Distilled water, 80 ounces; bichromate of potassium, 4 ounces; glycerine (pure), 1 ounce. The best manner of preparing the sensitising solution is to suspend a cotton or canvas bag, containing the bichromate, from the mouth of a glass or earthenware jar. Water is then poured into the jar until the contents of the bag are covered, and left until the bichromate is completely dissolved. For sensitising use a deep porcelain dish, perfectly clean, containing sufficient bichromate solution for the work in hand at the time. The pigmented paper is immersed face upwards, and then drawn through the bath from six to ten times; this prevents the formation of air bubbles on the surface. The temperature of the sensitising bath should be from 55° to 60° F. Exposure: The dried paper must be protected from light and damp until ready to be exposed under the negative. It should be stored in a tin tube provided with a calcium box. Development: The developing operation is carried on over a deep enamelled iron pan or tank, about twice as large as the size of the prints. A gas-burner or spirit lamp serves to keep the water at the desired temperature. This should be, at the beginning of the operations, for black and red about 100° F., and for sepia 110° to 115° F. It may be increased according to exposure and result desired, for black to 120° and for sepia to 140° F. A proportionate quantity of fine sawdust is put into

the hot water and stirred up for operating on the print. This is to assist the hot water in attacking the soluble parts of the pigment. The developing bath must not be sensibly thickened through the addition of the sawdust. The print is placed on a slab—metal, wood, or glass. This is laid on the edge of the tank, or held up with one hand, and the hot water passed over it by means of a jar, teacup, or jug. The development should last until the high lights are well out. Clearing: The prints are now washed under a rose tap, and then cleared from the remaining traces of bichromate in a solution of 4 per cent. bisulphite of soda. The prints remain there until the whites are perfectly clear. A final washing under a rose tap or in a few changes of water complete the operations. Those interested in this form of printing should apply to Mr. Gotz for fuller particulars and specimens of the process.

A Film Negative File.

Manufactured and Sold by The Thornton Film Co., Altrincham, Cheshire.

Designed to hold a hundred pellicular negatives, this "file" is issued in the form of a neatly-bound book, which may be conveniently placed on the shelf in company with one's other photographic volumes. By way of outer covering, it is inserted in a dust-tight storage case. We can certify, from experience, to the handiness of keeping film negatives in this way. Each leaf or envelope is open on two sides, so that the negative is easily inserted or withdrawn. With film photography growing increasingly popular, these negative files should be found widely useful.

Circular Nature Mounts.

Manufactured and Sold by Percy Lund, Humphries and Co., Bradford.

From the above-named firm we have received samples of a series of circular Nature mounts, consisting of stout paper of neutral tints, cut into circles of different sizes. Messrs. Lund add: "A very simple expedient will enable the photographer to cut his prints correspondingly, that is to say, take a size or two sizes smaller of mount, and draw with a pencil a fine line upon the print, and then, cutting carefully to this edge, a circle is obtained without a compass. Generally speaking, the wider the margin in reason the better the print looks. We find that, although when these Nature papers were first introdcued, dealers would hardly look at them, the demand is now so great that we have had to make special arrangements in the way of cutting machinery and so forth in order to keep pace with it."

News and Notes.

The Exhibition and Conversazione of the Thornton Heath Polytechnic Photographic Society, which was fixed for Saturday, February 9, has been postponed.

The Berlin Academy of Science has awarded the Helmholtz Medal to Sir George Gabriel Stokes, of Cambridge. The only other holders of this distinction are Professor Virchow and Lord Kelvin.

Great Yarmouth and District Camera Club.—The Hon. Secretary writes: "I am pleased to inform you that this new Club is gradually but surely increasing, and, although it was started only two months ago, it has now forty ladies and gentlemen members."

Redhill and District Camera Club.—We are asked to state that all communications, subscriptions, &c., should now be sent to Mr. Wm. Rowlinson, 80, Garlands-road, Redhill, who has been appointed Hon. Secretary, in succession to Mr. Francis H. Ellwood, on the latter's election to the Presidency.

Royal Photographic Society.—Lantern Meeting, Tuesday, February 5, at 66, Russell-square, at 8 p.m. "Romanesque Architecture," by Ernest Marriage. The Exhibition of Photographs, by Mr. F. M. Sutcliffe, at 66, Russell-square, is still open, and can be viewed on presentation of visiting card, from 10 to 4, Wednesdays 10 to 8.

Cripplegate Institute.—A course of eleven practical lessons in photography, specially arranged for amateurs, at the low fee of 10s., is being given at the above Institute, on Fridays, at 7 p.m., under the direction of Mr. C. W. Coe. Further particulars and syllabus can be obtained on application to the Manager, Cripplegate Institute, Golden-lane, E.C.

South London Photographic Society.—The Fifth Annual Dinner of the South London Photographic Society will take place at Anderton's Hotel, Fleet-street, on Saturday, February 16, at 6.30 p.m., and this year there is every reason to believe that it will be a representative and record gathering. Gentlemen friends of the members will be heartily welcomed at the dinner, tickets for which are 3s. 6d. each. The arrangements for the dinner and concert which will follow are in the hands of an able committee, viz., Messrs. C. F. Dickinson, E. G. Ruckes, and S. W. Whiteman.

The South London Photographic Society's Twelfth Annual Exhibition will be held at the Public Baths, Church-street, Camberwell, S.E., on Saturday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, March 2, 4, 5 ,6, 7, 8, and 9, 1901. It will be opened by the Mayor of Camberwell (Mr. Mathew Wallace). The following are the open classes:—Portraiture, Architecture, Landscape, Lantern Slides (sets of four), Stereoscopic Slides (sets of four). Entry forms and further information respecting the Exhibition can be obtained from Mr. Frank Goddard, Hon. Secretary, Woodlands, Vanbrugh Hill, Blackheath.

Conversazione at the Leeds Photographic Society.—On January 22 a very pleasant conversazione took place under the auspices of the Leeds Photographic Society, at the Philosophical Hall. Mr. J. W. Addyman, the new President, received the guests as they arrived. There was a concert, an exhibition of lantern slides, and also a number of pictures by the members, as well as some of the American photographs now in this country on loan. The local work was good, an improvement on last year, and distinctly creditable, on the whole, to the Society. The most noteworthy pictures were shown by T. Carter, J. C. Coultas, Godfrey Bingley, W. N. Coultas, and J. H. Gash.

Australian Photographers and the Commonwealth Celebrations.—We may easily imagine what the Commonwealth celebrations should mean to local photographers who are equal to a good spurt, when we casually run through our minds something of the probable field of work. Imagine the demand there will be for photographs of the official functions in connection therewith, of the procession, of the British military representatives, of national and industrial section decorations, views of the principal streets, business establishments, numerous competitive sports in honour of the occasion, demonstrations and incidents of most every description thought of. Furthermore, says "The Australian Photographic Journal," it is proclaimed by the daily press that the population in Sydney during the week's celebration will estimate more than double the present population.

The "Ubiquitous Snap-shotter."—The representatives of the press, according to the "Daily Chronicle's" correspondent, have been vigorously excluded from the Trinity Pier at Cowes. The reason for this, says our contemporary, is that some amateur photographer had the temerity to snap his camera in the German Emperor's face. It is added that the Emperor was considerably startled by the resounding click of the camera shutter. Most of us know that the "-snap-shotter" seems to turn up everywhere and on every occasion, and that he does not always "snapshot" with good taste, sometimes just the reverse. But, in the case just referred to—if it happened at all—it would be interesting to learn if it were really a bonâ-fide amateur photographer who had the temerity to "snap his camera" in the Emperor's face while on so painful an errand, or whether it was not rather some interesting photographic representative of one or other of the illustrated papers.

The Agfa Intensifier.—By the courtesy of Messrs. A. and M. Zimmermann, we have received the following notes on the agfa intensifier, by Mr. C. H. Bothamley, F.I.C., F.C.S.: The agfa intensifier is a colourless, odourless liquid, which before use is diluted with water in the proportion of one part of the intensifier and nine parts of water (e.g., 5 c.c. of intensifier and 45 c.c. of water, or one fluid drachm of intensifier and nine fluid drachms of water. I have made numerous experiments with this intensifier, some being supplied by Messrs. A. and M. Zimmermann and some being purchased from photographic dealers in the ordinary way. The undiluted intensifier remains unchanged after many months, and apparently would retain its properties indefinitely in a well-corked bottle. When a negative, previously well washed to remove all traces of hyposulphite (thiosulphite), is immersed in the diluted intensifier, it gradually gains in opacity without being stained in any way, if the washing after fixing has been done with reasonable care. The intensified image has a dark brown colour and considerable printing density. The intensification proceeds gradually, and can readily be watched. The maximum intensification obtainable is reached in twelve to fifteen minutes at the ordinary temperature, and the negative should then be removed and well washed with water. No further treatment is necessary, and the material composing the intensified image seems to be of a very stable character. It shows no signs of fading, even after several days' exposure to direct sunlight, but, on the contrary, increases slightly in opacity. It will be seen that the process is very simple, only one operation being necessary. The intensification obtained is greater than with mercuric chloride or mercuric bromide, and if, on the other hand, it is not so great as that obtained by the mercuric bromide and silver cyanide method, the agfa process has the advantage of being much simpler, whilst it gives sufficient intensification for all ordinary cases. The agfa process is also superior to the mercuric chloride and ammonia process in the greater permanence of the intensified image. If negatives are left in the intensifier after the maximum effect has been produced, the opacity begins to diminish, and the image, when viewed by reflected light, has a bleached appearance. Should this happen it is only necessary to wash the negative thoroughly with water and then treat it with any ordinary developer, when a strongly intensified image of a black colour is obtained. The agfa intensifier can be applied to lantern slides with very satisfactory results. The brown colour of the intensified image is very suitable to most subjects, and the deposit is not likely to fade. In conclusion, my experiments have led me to the opinion that the agfa intensifier affords a means of intensifying gelatino-bromide negatives and lantern slides which is not only effective, but is also very simple and convenient.

Commercial & Legal Intelligence.

Messrs. Newton and Co., of 3, Fleet-street, London, are issuing a set of slides entitled "The Personal History of Queen Victoria," a series of about 200 slides of all the principal incidents in her long and glorious reign.

Photographs of Frost Crystals.—Mr. G. Parkin, photographer, of 15, York-street, Wakefield, writes: "In your issue of the 25th ult. I notice

the inquiry by G. B. Rodger as to photos of frost crystals. Having devoted considerable attention in that direction, I shall be glad if you can give me his full address in your next issue." Perhaps Mr. Rodger will communicate direct with Mr. Parkin.

A NEW American Camera Company.—According to an American contemporary, the Century Camera Co., of Rochester, has been incorporated under the laws of New York State, for the purpose of manufacturing folding hand cameras and a general line of fine photographic goods. While the company is a new one in the field, its officers and directors are all men of experience in the camera business, having been in touch with the trade for many years, by reason of their association with the original Rochester Optical Co., under the sole management of W. F. Carlton, and also its successor, the Rochester Optical and Camera Co.

MESSRS. George Houghton and Son, of 88 and 89, High Holborn, W.C., inform us that their "Aura" paper is now much improved in every way. It is made in four varieties, and the paper is put up, as heretofore, in 1s. packets. In the "Victo" set Messrs. Houghton have made an important improvement for the coming season. The half-plate set now includes a Thornton-Pickard time and instantaneous shutter, the price being as last year, viz., £3 10s. Messrs. Houghton are also quoting these sets fitted with Busch rapid aplanat lenses, and are making them in 10×8 and 12×10 sizes. The same firm have also been appointed sole wholesale agents for the "Tella" camera, of which they hold stock in all varieties. Messrs. Houghton ask us to state that they will be pleased to send particulars of these cameras and also of the other articles mentioned to those interested.

A DAMAGED Photo.—Andrade v. Corlett.—The plaintiff in this action, Mr. Henry Andrade, of 64, Faversham-road, Catford, sued Mr. John Corlett, the proprietor of the "Sporting Times," 52, Fleet-street, E.C., at the City of London Court, before Mr. Commissioner Kerr, to recover the sum of £3 16s. 6d., in respect of a photograph that had been damaged. The photograph was sent to the defendant in order that a copy might be made of it, and the plaintiff maintained that it had been damaged by ink spots. The defendant said he was sure the ink spots could be taken out if the plaintiff would allow him to have the photo. The plaintiff would not agree to that, as he was of opinion that the spots could not be removed. Mr. Commissioner Kerr said the defendant ought to be allowed an opportunity of taking the spots out, and the case was accordingly adjourned for that purpose.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
4	Bognor	Demonstration: *Ozotype.* E. J. West.
4	Doncaster	*Narrow and Wide-angle Lenses and Subjects.* W. E. Debenham.
5	Gospel Oak	Social Evening.
5	Rotherham	*Hand-camera Work from Start to Finish.* A. Horsley Hinton.
5	Royal Photographic Society	*Romanesque Architecture.* Ernest Marriage.
5	Thornton Heath	Conversational Meeting.
6	Croydon Camera Club	Lantern Night.
6	Edinburgh Photo. Society	*The Distinctive Uses of the Hand and Stand Camera.* W. J. Croall, C.A.
6	Woodford	Lecture: *The Tella Camera.*
7	Darwen	Lecture: *Some Typical Subjects.*
7	Hull	*Decorative Photography.* Percy Sheard.
7	Leigh	*Exposure and Development.* Rev. F. C. Lambert, M.A.
7	Liverpool Amateur	Demonstration: *Lantern-slide Making on Krystal Plates.* B. J. Edwards & Co.
7	London and Provincial	*The Photography of Colour.* E. Sanger Shepherd.
7	Manchester Amateur	*Slide-testing Night.* James Shaw.
7	Röntgen Society	*Experiences of X-ray Work during the Siege of Ladysmith.* Lieutenant and Quartermaster F. Bruce, R.A.M.C.
8	Aberdeen	*Landscape Photography.* G. Ford.
8	Scarborough	*Decorative Photography.* Percy Sheard.
8	West London	*Enlarging.* A. E. Cockerell.
9	Glasgow and West of Scotland	Close of Exhibition.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 24,—Mr. T. K. Grant in the chair.

Mr. T. Thorne Baker gave an address referring to several important aspects of photography. A possible theory of the latent image was advanced as the result of some experiments, by means of which feeble electric currents had been obtained from gelatine films containing silver bromide. One side of the film was exposed to light and the other kept dark, and two pieces of gauze, pressed one against each side of the film, these being connected with an Ayrton-Mather galvanometer. As an explanation, Mr. Baker suggested that a rearrangement of the molecules of silver bromide might be brought about by the light. For example, if we consider the top few layers of a film—the only portion affected—each layer being a molecule in thickness, then at any one moment the silver bromide molecules will be in disorder. The effects of the impact of ether vibrations against the film act as a medium in which the disordered molecules change to a fixed position, thus rendering the light-affected side of the film at a higher or lower potential than the other. Hence the electric current. Mr. Baker also mentioned that, by passing an electric current through an amidol developer, he had at first increased the speed of development (of a bromide paper) to about four times, but that soon after it had no more effect.

Mr. A. Haddon suggested that the ions liberated at the electrodes had probably renovated the developer, and thus increased the effect of development of the paper.

Mr. Thorne Baker also dealt with the question of locally toning bromide prints. The local toning agents were compounded as follows:—

A. Uranium nitrate	3	grammes.
Potassium ferricyanide	1.7	grammes.
Glacial acetic acid	5	c.c.
Water	20	c.c.
Glycerine	10	c.c.
B. Two per cent. solution of ferric chloride	20	c.c.
Glycerine	10	c.c.

These constitute viscous fluids, which may be applied to the paper without any fear of running. A is applied for yellow, brown, and sepia, and B is applied, after A has been wiped off, for green and blue.

Mr. Baker also spoke of the effect of heat upon speed of development. His experiments showed that at 77° Fahrenheit development was about four times as fast as at 55° Fahrenheit.

In the discussion it was remarked that no more detail could be obtained by using heat unless it were accompanied by chemical fog. A member said that with ortol used at varying temperatures up to 80° Fahrenheit he had noticed that below 55° he could get no development to take place.

Mr. A. Haddon wondered that the galvanometer was used so little in experimental research. He supposed that people were dissuaded by the cost of very sensitive apparatus or by some sort of fear of this very useful device. He hoped soon to show how cheaply a galvanometer, sensitive to extremely feeble electric currents, could be made, and also to demonstrate some of the uses to which it could be put.

PHOTOGRAPHIC CLUB.

JANUARY 23,—Mr. F. A. Bridge in the chair.

The minuties of the last meeting having been read and other formal business disposed of, the Chairman said it was proposed, in view of the great loss sustained by the death of the Queen, that the meeting be adjourned. The meeting was accordingly adjourned.

North Middlesex Photographic Society.—January 21.—Mr. H. W. Bennett was the instructor at the first of a series of classes, to be held for beginners once a month. He dealt with "The use of apparatus." The subject was treated in as elementary a manner as possible. About fifteen of the visitors gave in their names and signified their intention of attending the series. There were between forty and fifty present, including members.

Yeadon and District Photographic Society.—On Tuesday evening, the 22nd ult., Mr. Walter D. Welford gave a practical demonstration with the films made by the Thornton Film Co. During the demonstration the non-inflammable nature of the film was shown. It was also shown that, if stripped and allowed to remain in the water, the film would enlarge and thus form a larger negative than the original, which might then be laid on a piece of clean glass which had previously been waxed. The film was roughly handled to show its toughness. After the demonstration, the Chairman mentioned that the only drawback to using films was the fact that they were no good when you wish to repair the cellar windows in order to keep stray cats out.

Patent News.

THE following applications for Patents were made between January 14 and 19, 1901:—

LIGHT-DIFFUSERS.—No. 974. "Improvements in or relating to the Means for Adjusting or Regulating the Shades, Reflectors, or Screens employed in connexion with Electric Lights, Gas Lights, and others for the purpose of concentrating and diffusing the light therefrom in any desired or required direction for the purpose of facilitating Photography, and Apparatus for effecting the same." N. S. KAY.

CAMERA.—No. 980. "An Improved Form of Magazine Camera." E. S. JORDAN.

RELIEF PHOTOGRAPHY.—No. 996. "A Process of and Means for Taking Profile Portraits in Relief." F. ARNOLD.

PHOTOGRAPH STANDS.—No. 1035. "Improvements in Joints or Hinges to be employed in connexion with the Backs of Photographic and other Picture Frames and Stands." R. MANDER.

STIPPLING.—No. 1092. "An Improved Process for producing Stippled or Grained Photographic Pictures directly from Photographic Negatives or Diapositives." R. WEDMANN.

DARK SLIDES.—No. 1101. "Improvements in and connected with Photographic Dark Slides and Change Boxes." A. A. BROOKS and G. A. WATSON.

FILM-CARRIERS.—No. 1109. "Improvements in or connected with Photographic Plate and Film-carriers and their Slides." J. ASHFORD and H. E. NEWEY.

ELECTRIC RETOUCHER.—No. 1134. "Electric-vibrating Retouching Apparatus." D. VON OLEGAR.

CAMERAS.—No. 1139. "Improvements in Enlarging or like Cameras." J. CARPENTIER.

TONING BATH.—No. 1168. "A Chemical Compound for Use as a Special Toning Bath in connexion with Photography." J. A. HICKS.

CAMERAS.—No. 1183. "Improvements in Photographic Cameras adapted to take Panoramic Views." E. T. DRIFFIELD.

PHOTO-MECHANICAL PRINTING.—No. 1291. "New Apparatus for Photo-mechanical Printing in full Daylight or by Artificial Light." A. V. CRISTIANI-MAYALL.

FORTHCOMING EXHIBITIONS.

1901.

February 16–March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S, 10A, George-street, Edinburgh.

,, 20–27 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath, S.E.

,, 23–March 2 Birmingham Photographic Society. Hon. Secretary, H. Vooght Cornish, Athletic Institute, John Bright-street, Birmingham.

March 2–9 ..... South London Photographic Society. Hon. Secretary, Frank Goddard, Vanbrugh Hill, Blackheath, S.E.

,, 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

RODINAL.

To the EDITORS.

GENTLEMEN,—In response to the letter in last week's BRITISH JOURNAL OF PHOTOGRAPHY, may I give an experience which appears to show that rodinal is not always harmless? I found metol brought out a rash on my fingers like the sting of nettles, which remained a week or two, and finished with a peeling of the cuticle. I now carefully avoid metol; but the curious fact is that, though I have often used rodinal with immunity, I now find it to produce the same symptom as the metol. I presume it is owing to a specially susceptible condition.—I am, yours, &c., F. C. S.

To the EDITORS.

GENTLEMEN,—In reply to the letter of "An Old Photographer," re rodinal, I am afraid the eczema he mentions is traceable to the use of rodinal. When I did my own developing rodinal served me in a similar manner. Two years since I was in an awful state, literally from head to foot, and during July I could only wear shoes two sizes too large. The best remedy I found was boracic acid ointment. Rodinal is undoubtedly a powerful developer, and it is better to wear indiarubber gloves as a safeguard when you use it.—I am, yours, &c.,

CHARLES KNIGHT.

The Royal Studios, 18 and 26, Queen's-road, Aldershot,
January 27, 1901.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—A full discussion of the subject of working curves for trichromatic printing processes under the conditions of ordinary practice involves the recognition of so many and varied factors that it might very well be interminable, because no perfect solution is possible with three printing colours in ordinary white light no matter how perfect the colours and processes employed; and weaknesses can therefore be pointed out in every definite procedure that can be formulated.

Mr. Tallent, in his letter (p. 15, January 4), says that, "under usual working conditions" we should work to "curves derived from actual mixtures of properly chosen pigments." Now, I have practically said the same thing, in one of my papers read in London some years ago, when I said that the measurements should be made with the colours actually employed in synthesis, if the synthesis colours themselves did not fulfil theoretical requirements; a proposition which applies equally to positive and negative synthesis. Nevertheless, to ignore the theoretical bearing of the Maxwell curve analysis upon the subject is to reduce the question to one of mere expediency for the time being.

It is easy to say our colours and processes for synthesis are imperfect, and we will just try to make the best of them; but I am assured that nobody who experiments upon this basis will ever reach a very high standard. We should rather strive first to realise the best theoretical conditions, and then to make our synthesis colours and our processes meet these conditions.

In my letter of last week I gave some of my reasons for holding a different opinion from Messrs. Farmer and Tallent. My contention, in the main, is that the highest standard of accomplishment is the most perfect differentiation of hues and luminosity values, and that, in order to discredit the principle which I have laid down for securing this, one must first disprove two fundamental propositions which I have stated. One is that a correct record of hue and luminosity values of light cannot be obtained in three photographs without working pretty close to Maxwell's curves. The other is that the best printing colours are those most specifically antichromatic to the visual impression of the respective primaries in white light. The latter proposition might, perhaps, be better stated; but my meaning is made sufficiently clear by the diagram and text in my Traill Taylor lecture. I believe that both of these propositions are capable of both mathematical and practical demonstration, and that the most perfect differentiation of hues and luminosity values, the most perfect trichromatic printing process, involves the selection of such printing colours by such photographic analysis, as surely as that two and two make four.

Admitting that, with imperfect synthesis colours and imperfect processes, other analysis curves may be better than Maxwell's, I contend that the very method which Mr. Tallent advocates for deriving the analysis curves will work out closer and closer to the Maxwell curves as his synthesis colours and processes are themselves brought nearer to the theoretical rquirements. I therefore strive to bring the inks and processes to suit the true analysis curves, instead of changing the analysis curves to favour the employment of printing colours and processes which are defective under any conditions of use whatever. The test which I set may be more difficult to perform than that which Messrs. Farmer and Tallent propose, but I contend that it points to a higher ultimate achievement, and that failure to recognise this fact will delay the best kind of progress.

Practical experience confirms my theories. In gelatine printing the colour prints which I get from Maxwell curve negatives are so faithful to the original and to the kromskop images that they have been accepted as knockdown arguments by sceptics who have examined them. In the use of printing blocks and ordinary printing inks I got less encouragement until I made my inks with my own colours, in water-white medium, and so that they dried with a gloss. I then reproduced a subject, including a very great variety of colours and hues, with eminent success.

In view of inherent limitations, which I perhaps have seen as clearly as anybody, it must be confessed that something may be said for both points of view; but I was never more certain than I am now that, in order to secure the highest ultimate achievements, we must make it a condition to secure, in the first instance, an analysis which records the hue and luminosity value of every spectrum colour.

I maintain that if Mr. Tallent will find printing colours which exactly meet my specifications, and will then work out his curves with these colours, using the spectrum itself as his subject, and preserving luminosity values, he will substantially reproduce the Maxwell curves. If not, I should like to know why not; and, if he would choose other printing colours, I should also like to know why. I make no allowance for defective printing colours, because one condition of success is perfect printing inks, and I believe they can be produced.

It seems to me that our differences may be summed up in the two comparative propositions following:—

TALLENT (?)	IVES.
Our printing colours and processes do not suit Maxwell's curves, therefore analysis according to Maxwell's curves is wrong both in principle and practice.	Maxwell's curves indicate the only colour analysis which perfectly differentiates all hues and luminosity values, and, therefore, for the highest achievement in three-colour printing, the printing colours and process must, and probably can, be made to suit the Maxwell curves.

—I am, yours, &c., F. E. IVES.

Philadelphia, January 15, 1901.

DISTORTION IN LANTERN SLIDES.

To the EDITORS.

GENTLEMEN,—I am considerably surprised at your publishing an article so misleading as that in the number for the 18th inst. entitled "Distortion in Lantern Slides and its Cure."

I is evident that, to copy the negative in the camera, the negative being tilted and the plate vertical, the slide will be fuzzy top and bottom, unless, as suggested, a small stop is used; but there is another method (already published), which ought to have suggested itself to the writer—the simple one of swinging slide plate, as well as the negative, for the top of the negative being brought nearer the lens the focus is thrown further away, and, the bottom of the negative being put further from the lens, the point of focus is brought nearer.

Not only is this easier, but more correct; but to bring the slide to correct shape requires the diametrically opposite method to that suggested by the writer of the article. The negative should be kept vertical, and the plate swung out of the perpendicular. For instance, take a hoarding or wall divided into square panels, and take, with

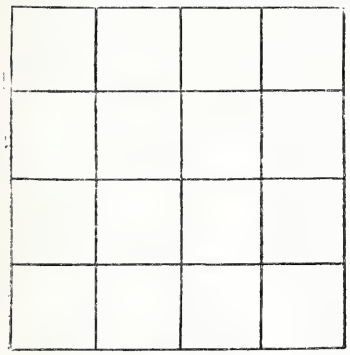


FIG. 1.

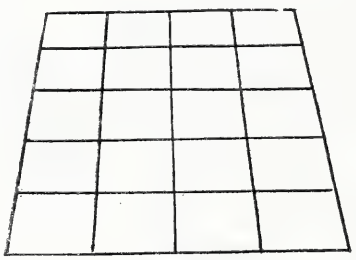


FIG. 2.

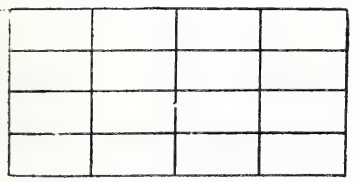


FIG. 3.

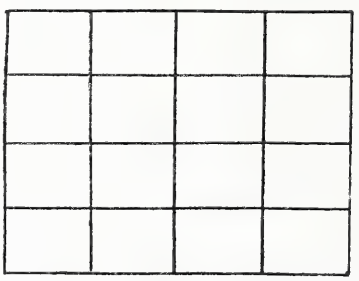
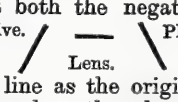


FIG. 4.

camera centrally opposite, and you will get as result fig. 1. Now take the same with camera badly tilted, and you will get a negative something like fig. 2. Now tilt the negative, and keep the plate vertical, and the result will be fig. 3. Now tilt both the negative and the plate in opposite directions, so—



and the result is fig. 4. Same height and base line as the original negative, but squared up sufficiently to be rectangular, though still foreshortened.

Now reverse the method suggested by your contributor, and you get the subject, not only vertical, but lengthened out to the correct scale, though, as mentioned, a very small stop must be used.—I am, yours, &c.,

A FREQUENT USER OF THE PROCESS.

January 19, 1901.

[The tolerably well-known method referred to has more than once been described in back volumes of the JOURNAL. But it presupposes that the worker is the fortunate possessor of two cameras, both with swing backs. That is not, however, the case with the majority of hand-camera workers—many have not even one. The object of the article was to point out how those who had one, or none at all, could, in a simple, practical, and extemporised way, correct converging perpendiculars existing in the negative, through tilting the camera, in their lantern slides. EDS. *B.J.P.*]

EVOLUTION OF THE CAMERA.

To the EDITORS.

GENTLEMEN,—Some time ago, when preparing a lecture on landscape photography for the affiliated societies, I looked up the history of the camera as an instrument, intending to include a sketch of its development in the Historical Section. Like yourselves, I traced the bellows body back to Fowke in 1854, thinking this was the genesis of the bellows form; but, on showing my notes to my friend, Dr. Quirin Wirtz, he very kindly directed my attention to a statement of Dr. Eder's, in his "Handbook of Photography," second edition, in which he credits Seguier, of Paris, with the invention of the bellows form. Seguier appears to have shown a bellows-body camera at a séance of the Société d'Encouragement on October 9, 1839, and it is described in the "Bulletin Soc. d'Encouragement" of March 1840, thus anticipating Fowke's invention by fourteen years. Sir W. Abney also gives Fowke the credit of the invention of the bellows body, see his article in the "Encyclopædia Britannica" on "Photography."—I am, yours, &c.,

GEORGE T. HARRIS.

The Studio, 326, Camden-road, London, N., January 28, 1901.

THE DEFINITION OF A "BONA-FIDE DEALER."

To the EDITORS.

GENTLEMEN,—We think it would greatly simplify matters, and save much friction if it could be elicited from the Association of Manufacturers of Plates, Papers, and Films, what is their definition of a bonâ-fide dealer?"

We have twice been removed from the Association's list of dealers, and twice reinstated, to our great detriment, loss, and annoyance; and this without a single question being asked, or a single explanation vouchsafed, by that body, in spite of voluminous correspondence on the subject. The action of the Association does not affect us one jot so far as discounts are concerned, because there is not the slightest difficulty in procuring the goods from several sources at identically the same rates as allowed to "bonâ-fide" dealers by the various firms who are members; but, on a question of principle, it affects the average small dealer very considerably, and it is on principle, and principle only, that we have spent time and money in seeing justice done.

We may add that the whole of the correspondence is open to your inspection, or the inspection of any parties interested, upon application. We note with satisfaction that such firms as Messrs. Cadett and Neall, B. J. Edwards and Co., the Platinotype Co., and others, are not members of the Association. *Verb. sap.*—We are, yours, &c.,

BUCHANAN-WOLLASTON & Co.

The Western "Studio" and Photographic Stores, Sidmouth, January 26, 1901.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION LIBRARY.

To the EDITORS.

GENTLEMEN,—Some time since I appealed to the members of the Association for some books for our new bookcase. This has been very liberally responded to, for our Hon. Secretary, Mr. W. D. Welford, has practically presented the whole of his photographic library, some ninety volumes. As we have so many new members, a good library is very necessary.—I am, yours, &c.,

January 26, 1901. T. E. FRESHWATER.

POISON ANTIDOTES.

To the EDITORS.

GENTLEMEN,—I notice on page 971 of THE BRITISH JOURNAL ALMANAC, under "Poisons," directions as to first-aid in such cases, which, if followed, might produce disastrous consequences. Tartar emetic is a very depressing emetic, not suitable for use as a pure emetic on that account. Besides that the dose given is far too large; a single dose of five grammes would be extremely depressing, and a dose of one gramme has been known to prove fatal. One gramme would be enough, as a rule. Even if for gramme grain is read, it should certainly not be repeated at short intervals—a most unsafe proceeding. More suitable emetics are: zinc sulphate, 2 grammes; copper sulphate, .3 grammes; or mustard, or salt and water.—I am, yours, &c.,

H. B. MILSOME, M.B.

Guildford House, Chertsey, January 27, 1901.

[We thank Dr. Milsome for his correction. The remedy mentioned, for a case of poisoning by an unknown cause, was quoted from Herr Crouzel in the "Chemiker Zeitung." EDS. *B.J.P.*]

PHOTOGRAPHS REGISTERED:—

A. Spurge, 7, The Corridor, Bath.—*Photograph of proclamation of King Edward VII.*

J. Fairweather, 7, Ellice-place, St. Andrews, N.B.—*Photograph of South-street, St. Andrews.*

W. H. Warburton, Harris Promenade, Douglas, Isle of Man.—*Two photographs of Deemster T. Kneen.*

Answers to Correspondents.

** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

AUTOCAM.—We regret we can give you no further particulars, as the camera does not appear to be on the market.

MASTIC.—S. DAVIES.—Your trouble is easily accounted for. The resin which you enclose a sample of is not mastic at all but dammar, and not a very good sample of that. You are scarcely likely to get good mastic at the ordinary oil shops. Better try at a varnish maker's.

PRICE OF SILVER.—"ARGENT" writes: "Can you tell me the highest market price that metallic silver has reached, and about the date?"—In reply: We cannot say. We know, however, that, somewhere about forty years ago, standard bars were quoted at 62 pence per ounce. That is considerably more than double the present price.

ELECTRIC LIGHT FOR PORTRAITS.—T. E. THOMAS says: "I have just bought, second-hand, a twelve-cell Smee's battery. Will that do for an electric light for portraits in the studio, and, if so, what lamp should I get?"—In reply: The battery is quite useless for the purpose. For an efficient light, with a battery, about forty Bunsen and Grove cells are necessary.

EARLY PHOTOGRAPHY.—C. WILLIAMS asks the following query: "Where can I find a description of the early processes of photography, which I frequently see alluded to in THE BRITISH JOURNAL OF PHOTOGRAPHY?"—In reply: Most of them are described in Hunt's "Photography." The work has long since been out of print, but copies are sometimes to be met with at second-hand bookshops.

BLISTERS ON ALBUMEN PAPER.—"PRINTER" says: "We have recently been using ——'s albumen paper, and, do what we will, it blisters frightfully. It is floated for three minutes on a sixty-grain bath: we have tried other strengths and other times of floating, but it seems all the same. Can you, please, help us?"—In reply: Before washing the silver out of the prints put them for a minute or so in methylated spirit. Then proceed as usual. That is the best preventive of blisters we know of.

COATING PAPER WITH CELLULOID VARNISH.—S. THORN asks: "If coating paper with celluloid varnish would make it suitable for coating with bromide emulsion. If so, what strength and how should the varnish be made?"—In reply: We have not tried it, but we should expect that there would be some little difficulty in getting an even coating of the emulsion on the varnish, owing to its more or less repellent nature. We should recommend you to use a paper with a baryta coating rather than one with a varnished surface.

TRANSPARENCIES FOR ENLARGED NEGATIVES.—J. C. WALTHEW writes: "Please tell me which process is best for making transparencies for procuring enlarged negatives from? I mean such negatives as are used for carbon enlargements. I cannot get on with dry plates, and I do not know the wet-collodion process?"—In reply: Good transparencies can be made on gelatine plates, but those usually employed by those who make carbon enlargements, professionally, are by the carbon process, as these are considered by them to be best suited for the purpose.

THE ASSOCIATION OF ROYAL WARRANT HOLDERS.—W. ABERNETHY writes: "I would esteem it a favour if you could give me the name of the Secretary of the Society for Royal Warrant Holders, who are entitled to use the Royal Arms, as I would like to become a member of the same. I would like to ask his opinion about a photographer who has the coat-of-arms and the words "By appointment" above his studio, when he has not received same."—In reply: The address does not appear in the London directory, but we believe the Secretary of the Association is Mr. Edward J. Watherston, of Pall-mall East, S.W.

AN OLD LENS.—"INQUIRER" writes: "Would you kindly inform me in next week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY the cost, age (about), and present value, also whether it is possible to replace stops, flange, and cap of a whole-plate first-rate lens by Alexis Millet, Paris. I have been offered a lens of this description for 30s., but would like to know if you can give me any information concerning same, or would it be better for me to forward it for your judgment?"—In reply: We cannot say the age of the lens, but it must be a pretty old one, and we should say the price put upon it is full market value, seeing that it is minus stops, flange, and cap. Of course, any optician (photographic) would fit these for you, but they will add materially to the cost of the lens.

RETOUCHING LESSONS.—"J. J. B." writes: "I am working with the photographer here, but I am sorry to say he cannot retouch. Could I get lessons that would be any use to me through post from some of our advertisers in THE BRITISH JOURNAL OF PHOTOGRAPHY? I produce fairly good work. I am really anxious to learn retouching and spotting, &c. Can you advise me?"—In reply: We should say such lessons would be useful, but not to the same extent as if they were taken verbally. Cannot you get some practical instruction in your neighbourhood? If you could it would be preferable.

ADDRESS WANTED.—J. H. BAKER writes: "Some time ago you mentioned something about an apparatus for igniting flash powder by electricity, made by Messrs. Himmer and Porter, of New York, U.S.A., a battery which caused a piece of platinum wire to become white hot. Can you tell me where to get one, or will you give me the address, so I may write to the makers? Only the name was mentioned, not the proper address of Messrs. Himmer and Porter. Can you tell me how to get a copy of our ALMANAC? I placed an order over a month ago, and, owing to neglect on part of my newsagent, I have not got one, and that is a great loss to me."—In reply: 1. We gave the fullest address we could obtain. The apparatus is not on sale in England; you must write to New York. 2. One of the large dealers may be able to supply you.

CYANOTYPE LANTERN SLIDES.—"CYANOTYPE" writes: "On Page 709 of THE BRITISH JOURNAL ALMANAC for 1901 you publish a formula for 'Cyanotype Lantern Slides,' by Geo. W. Valentine, in which citrate of ammonia and quinine is named. Could you inform me whether that is correct, as I am unable to obtain it? Chemists do not even know it. Is it a new preparation, or a misprint?"—In reply: We submitted the foregoing query to Mr. Valentine, who replies as follows:—"In reply: Yes, that is the correct name for it, used largely for cure of influenza for many years. It is sensitive to daylight even when in dry state, and also to moisture, and for that reason should be kept in a wide-mouthed stoppered bottle in the dark. Any branch offices of Southern Drug Co., or Messrs. Burrows and Welcome's agents, or even friend Fallowfield, I have no doubt keep it."

BURTON'S EXPOSURE TABLE.—G. LAWSON writes: "Will you kindly tell me for what speed of plates the table on page 679 of your ALMANAC for 1901 is calculated? I have not the 1899 "Burton," but in the 1894 edition the calculations are stated (page 84) to be for 'ordinary' plates and (p. 83) 'the very best light,' i.e., the middle of the day, in May, June, and July.' No doubt, the speed of plates has much increased since the 1894 edition, but I note the exposures in your ALMANAC (from the 1899 edition) are one-fifth those given in the 1894 edition, and it has occurred to me that the calculations may be possibly now made for 'rapid' or 'special rapid,' instead of 'ordinary' plates. I assume the light to be the best."—In reply: Burton, in the 1899 edition of his book, wrote: "The table exposures will be found suitable for plates of good but not extraordinary rapidity. The rapidest plates commonly to be had on the market will do with half these exposures."

LENS QUERY.—"AMATEUR" writes: "I have got a new half-plate camera, but find that, when focussed, the lens does not cover the whole of the plate, there just being a circle in the centre clear and the rest in darkness. The lens is, apparently, of very short focus (about five inches), and the bellows requires to be racked in quite close, almost touching the ground glass, thus cutting off the light at the corners. Could you, please, suggest any way of altering it so as to make the lens cover all the plate? Do you consider that a too short focus lens for general use?"—In reply: The lens is much too short in focus for general work on a half-plate. For that size plate the focus of the lens should be eight to nine inches. We should advise you to get a lens of longer focus. The only way of lengthening the focus of the lens you have is by the addition to it of a negative lens, but then it will be slow in action and the pictures yielded not so good as with a proper half-plate lens.

GHOSTS.—"AUG WHEELER" writes: "I should be much obliged if you could offer any explanation of the appearance of the "ghosts" in the enclosed unfinished prints, negatives taken in Canada. In the exterior view the "ghost" appears on the snow on the right of the picture, and in the interior on the pews. The camera and lens used are by no means new, and the phenomenon has never been seen before. Particulars of exposures, &c., are on the other side. If possible, an answer in your next issue would be esteemed. Interior view: Exposure, 15 minutes, weather cloudy, snow on ground. Lens, a Voigtlander's collinear lens, series II., No. 3. Aperture E. 15. Plate a Seed double-coated non-halation. Thornton-Pickard shutter, opened by the cord. Glass in windows mostly of a yellow tint. Exterior view: Exposure ¼ sec. Same day, same conditions, same camera and lens, at F. 25. View taken from N."—In reply: The ghosts are caused by a small orifice in the camera, which has acted as a "pinhole camera." At what part of it the hole is we are unable to say. But you will, doubtless, be able to find it if you examine the camera from the inside in a strong light.

COPYRIGHT.—"A PHOTOGRAPHER" writes: "1. I have photographed a country village church. It is a very good view, and there is a gentleman in the same village who has had my photograph copied and printed on writing paper, also sold a lot of them on cards. I should be pleased if you could tell me what to do in this.

matter, as I wish to stop them selling it, being it is from my best view. Could I stop them if I copyright it now, or is it too late? This gentleman only paid 1s. 3d. for a whole-plate size, unmounted, but he did not say that he wanted it for that purpose. Most people, when they have wanted a view for that purpose, they have always asked my permission, and I generally get a good bit when they are for that purpose. I call this man a very mean one, doing me all the hurt he can. People cry shame of him, and I hope it will not do him any good. Hoping I shall not give you too much trouble (2), please state what is the price charged for copyrighting photographs, as, after this, I shall copyright all my good views."—In reply: 1. As you have not registered the photograph, we doubt if you can recover. 2. Send our publishers two prints and 1s. 7d., and they will effect registration for you."

LANDLORD AND TENANT.—"TENANT" writes: "In October, 1894, I bought this business, the owner promising to transfer to me the remaining portion of the late proprietor's lease. This was not so transferred, but a new 21 years' agreement made and sent to me for signature. This I refused to sign. I have never yet done so, owing to the repairing and other clauses, to which I took exception, as the premises were in a bad state of repair. Now there presents the opportunity of my securing, if taken at once, more suitable premises, so on December 22 last I gave the owner, through his agent, three months' notice of my intention to quit in March next. He refuses to accept this notice, and says he requires a six months' notice to expire next Michaelmas. Under the circumstances, is it right he should claim more than a three months' notice? I pay my rent quarterly."—In reply: It would seem that you have become a yearly tenant, in which case the landlord is entitled to a six months' notice, to expire at the same quarter as the tenancy commenced. The rent having been paid quarterly makes no difference. We should advise you to consult a solicitor on the subject.

REGISTERED LANTERN SLIDES.—"B. C. B." asks: "Having a biunial lantern, I intend going out lecturing, but before doing so should like to have all my slides in perfect register. If you could help me I shall be grateful for your advice. 1. All my slides are unframed, the frames adding to bulk and weight, and all my slides are photographs. One of the sets is Rome. They are masked in dome masks. Another set, all the views are masked circular, the view only just coming to edge of mask. These are all beautifully coloured by one of the best artists. I could not use other shaped masks for them. Then, again, with this set are maps; they are masked in long shape, if masked in the circular or oval it would cut a lot off. I do not see how it possibly can be put in register. I should like to use Hughes's bevelled-edge register-carrier, which they have circular or square. Your advice on this will be very acceptable."—In reply: We scarcely grasp what you mean by register. If the glasses are all of one thickness, when one is focussed on the screen the others will be in register with it. Of course, the masks govern what is shown on the screen, and, if the slides cannot all be masked to the same shape, that cannot be helped.

STUDIO BLINDS.—"PORTABLE" writes: "Will you kindly do me the favour to examine the enclosed photographs, and then give me your advice how to alter the arrangements of blinds in my studio that the faces will appear much rounder. I enclose a picture of the studio, which you will see is on wheels. The height to eaves is 7 ft. 9 in. and to roof ridge 8 ft. 6 in. I have the curtains of slate grey, working close to glass of roof from camera to the sitter, all in one length. The picture shows the working of the blinds at side. The glass at sides is 8 ft. long by 7 ft. 6 in. high. I cannot have a more opaque distance at end, or there would be such a heavy shadow on background. The roof of studio is at an angle two-thirds of the width. I cannot put very much shadow on the faces, as I find the majority of my sitters do not like it."—In reply: We do not see that the blinds can be well improved upon. The roundness of the faces is dependent upon the way the blinds are used. Greater roundness may be increased by increasing the shadows and by using less front top and side light. If the specimens sent were taken in this studio, there is not much to complain of in them, as they are tolerably good pictures. The photographs have been returned, as desired.

STARTING A BUSINESS.—"L. G." writes: "I am a young man (age 26), and have been for ten years in the photographic-apparatus trade, but had, unfortunately, to leave my situation in July last owing to ill-health, and shall have in future to reside on the South Coast. Under these circumstances, I have been thinking that perhaps a small photographic business would be the best thing for me to undertake; but, as I have no knowledge of studio portraiture, it would, of course, be necessary for me to either employ an operator, or I might possibly get a partner with a knowledge of the business, and, as I have only a very small amount of capital, I am afraid that I should be unable to purchase a business the returns of which would bear this double expense. I should, of course, be glad to combine a retail material trade with the business, if possible. I enclose two advertisements cut from your JOURNAL as specimens that seem to meet my requirements, and shall be very glad to have your advice on the matter and to know the smallest amount of capital you think would be necessary to purchase and start a business of this description."—In reply: A matter upon which we can be of very little help, as we know nothing of the businesses and do not lay ourselves open to give advice of this nature. But, generally speaking, we should say our correspondent would be ill-advised to start in business without a capital of some few hundreds of pounds.

LENS POLISHING.—H. MASON writes: "A friend of mine has a proce whereby, only by polishing the lens, it very greatly improves t definition. He tells me it is done by a very simple process. have seen many testimonials from admirals and generals. I sh be obliged if you would advise him the best way to put his pate on the market. Should I put it before Ross, or any le maker?"—In reply: Besides Messrs. Ross, Messrs. Dallmeye Messrs. Beck, and Messrs. Taylor, Taylor, and Hobson could approached in the matter. But modern lens-polishing is alrea carried to a high pitch of excellence, and we should advise o correspondent's friend not to be too sanguine that he can impro upon the best German and English workshop methods.

VARIOUS QUERIES.—"FRED. M." writes: "1. Will you kindly tell n the address of a maker of steel dies for stamping name on po trait cards, also of a firm who does gold and silver stamping f the trade. 2. The average price of outdoor work by old-esta lished photographers in country districts, such as groups, hous tombs, &c., if proofs only are accepted and no more copies r quired, or, if half-dozens or dozens, say, in whole-plate a ordered, mounted, in P.O.P.? Of course, I am referring to wo where there are no special difficulties or journey expenses. Should old sulphocyanide toning baths be alkaline or acid for t purpose of recovering the gold? The usual amount of iron do not seem to have the same effect as with the acetate baths former used by us."—In reply: 1. There are no die-sinkers who mak a speciality of dies for photographers that we are aware of, b any one would make dies to your order. A list of die-sinke and also gold-blockers will be found in the Post Office Director It is against our rule, as we have said many times before, t recommend any particular firms. 2. There are no regular charge for such work. Every photographer makes his own terms, an they vary considerably, some being several times the price o others. So much depends upon the quality of the work. 3. Acic Possibly the bath was exhausted, or nearly so, of the gol before the iron is added, when there is, of course, little gol to recover.

LENS QUERY.—"ASTRO" writes: "I have a reflecting telescope 8 in diameter, 6 ft. 3 in. focal length (= f-9 nearly), and wish to en large the image of the moon before photographing it. Th original image is about .7 in. diameter, and I should like it en larged to anything between 1½ in. and 2½ in. If I use an eye piece the photographic focus will not agree with the visual one I have obtained two of the small lenses advertised by Shar and Hitchmough (page 1323 BRITISH JOURNAL ALMANAC, 1901) These are 1 in. diameter (.95 in. when mounted) and 5 in. sola focus measured from the convex side, the convex side being to wards the sun. Can I usefully employ these for the purpose mounted as a doublet? I can, I presume, either mount the lense as a photographic doublet, with the plane sides towards each other, or as a Ramsden eyepiece, with the convex sides toward each other. Which is best? The camera extension to be kep short. What distance should they be apart, and is the measure ment from the plane faces or the convex ones? Which face should be towards each other, and what size stop can I use, an where must I fix it?"—In reply: If the telescope is already fitte with an eyepiece, we should advise you to use that, making the slight correction for the chemical focus if such be found neces sary. You will find that better results will be obtained with it than is probable with an eyepiece of your own construction. If the instrument has not a properly-constructed eyepiece, we shoul advise you to take the photograph without one, and enlarge it to the size desired afterwards. By working without the eye piece you will not be troubled with a chemical focus.

IDENTIFYING ACIDS; PIGMENT PRINTING.—"A. G. B." writes: "1. I hav several bottles of acids from which the labels have come off and am at a loss to identify their contents. Would you kindly tell me the simplest way to arrive at this? They are mostly, I think, nitric, hydrochloric, and sulphuric acids, but, perhaps, one or two others. 2. Is is not a fact that for the commoner (less delicate) operations hydrochloric and sulphuric acids can be substituted one for the other without injury? The A.G.F.A.'s P.O. pigment process:—The proportions of the sensitising solution are: Six parts gelatine, 16-20 bichromate ammonia to 100 water. At 60° a 10 per cent. solution of bichromate ammonia is a saturated one. Even if the solution were used warm, would there not be a tendency for the salts to crystallise out on the paper? 3. This is again, I suppose, another modification of the Mariotype. Are the results to be compared with the carbon process? 4. As regards relative permanency, I presume that the ratio is that of the aniline dyes as compared with the pigments used with the tissue?"—In reply: "1. The three acids named are easily recognised. The sulphuric by the addition to it of a solution of chloride of barium, when a precipitate of sulphate of baryta will be thrown down. Hydrochloric by the addition of a solution of nitrate of silver, when chloride of silver will be precipitated. Nitric acid will not yield a precipitate with either of these salts. Acetic acid will be recognised by its smell. 2. No, except for cleaning vessels and suchlike purposes. 3. You appear to be in error as to the solubility of bichromate of ammonia. There will be no difficulty whatever in getting the quantity named in solution, and even much more than that, at a temperature of 60°. You are evidently confusing the ammonia salt with the potassium one, which is only soluble to the extent of about 10 per cent. 3. Scarcely. 4. Yes, precisely.

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EX CATHEDRÂ.

The Silent City of Alaska. Of the many photographic frauds and impostures which from time to time we have had bare and transfixed, we thought that absolutely the deadest of all was the one that went by the name of the Silent City of Alaska. But, to all appearances, this particular piece of humbug is indestructible—that is if we are to place any faith in the evidence of print. How long the paragraph we are about to quote may have been meandering through the pages of the press we do not know. Day by day our reading, like Mr. Weller's knowledge of London, is extensive and peculiar, but it was only last week that our eyes fell upon the following in the pages of our English contemporary "Invention":—"A party of scientists are making preparations in Victoria, B.C., for a visit to the big glacier at Mount Fairweather. They hope to identify the mirage of 'the Silent City of Alaska' with Bristol City in England. The mirage is visible in June, and stretches for five miles. The members of the parties will photograph the mirage, note the conditions as to time, weather, &c., and then communicate with Bristol to learn whether the concurrent conditions are similar." This paragraph probably made its first appearance in America—the phrase "Bristol City in England" is a distinctly Transatlantic bit of journalese, and we shall not be surprised to find that it is only at the outset of an active and meteoric career in the pages of the halfpenny newspapers; journals of the snippet kind, and similar publications which drive a profitable business by amusing or entertaining their readers at the expense of accuracy. We are bound to point out that the paragraph we have quoted lacks some details, the nature of which greatly excites our curiosity. The names of the British Columbian "scientists," for example, and the names of those with whom it is proposed to communicate in Bristol—when the mirage has been photographed. Who are these amazing "scientists," we wonder?

* * *

The History of a Fraud. It is a little over seven years ago that a 12×10 photograph was placed in our hands by a prominent spiritualist who had received it from a confrère just arrived here from America. The view was that of a large city, photographed from an eminence, and in the printing an effect of mistiness had been imparted to it. The print was entitled "The Silent City of Alaska," and we were asked to believe that it was a photograph of a mirage or aerial city visible at Glacier Bay. Unfortunately for this fairy-like idea, some two or three days before the photograph was shown to us we had returned from a visit to Bristol, which we had no difficulty in persuading our friend was the original of "The Silent City." Instantly the pen was taken and the print labelled as fraudulent. The impudent imposture bore the name of an American photographer. Rather more than two years ago Mr. W. H. Midwinter, the well-known Bristol photographer, communicated with us on the subject of the alleged photograph of the aerial city, sent us a print from one of his own negatives of the pirated view, and supplied us with many interesting details relating to the "Silent City" imposture. Mr. Midwinter pointed out that the mirage picture was a copy of a photograph of Bristol taken in the winter or early spring of the year that Prince Albert Victor went to Bristol, as the scaffolding was on the Cathedral west towers. Perhaps the British Columbia "scientists" (sic)

had better write to Mr. Midwinter before they set out for Glacier Bay. It might deter them from undertaking a "scientific" goose chase. The part of the business which struck us most forcibly when referring to the matter in November of 1899 was the fact that these Silent City photographs were not only published by a San Francisco photographer, but copyrighted! And then the title—"The Silent City:" what could have been more cleverly chosen to delude the credulous and hoodwink the very large class which is only too easily taken in by astute traffickers in the pseudo-supernatural!

* * *

The Camera Club Meeting. Under the judicious chairmanship of Mr. W. Asbury Greene (one of the oldest and most respected members of the Club), and who will in future fill the office of its Honorary Legal Adviser, the Annual Meeting of the Camera Club, on Friday last, passed off with a smoothness and decision all the more gratifying because perhaps such a result was not generally expected. Notwithstanding the national mourning, there was a large attendance of members. The report and balance-sheet were adopted; Sir William Abney was re-elected President; a board of Directors to the number of twenty appointed, and Mr. H. H. O'Farrell was chosen Honorary Secretary. An alteration of the rules was resolved upon, the effect of which is to exempt the first hundred members elected after January 1, 1901, from the payment of an entrance fee of £5. It transpired, in the course of the discussion on this point, that in former years the imposition of an entrance fee operated to the advantage of the Club rather than otherwise. With a handsome guarantee fund of between six and seven hundred pounds, the immediate prospects of the Camera Club are decidedly encouraging. The voluntary retirement of some of the older members from the responsibilities of management and directorate creates an opportunity for the introduction of a change of policy and administration which, it may be hoped, will result in the early adaptation of the Camera Club to the altered needs of the times. But this is not a subject that admits of public discussion in detail. The broad fact that the Camera Club, as a social and photographic centre, has clearly passed the crisis by which it was recently overtaken is the one thing above all others which is of general interest. Of late years the photographic side of the Camera Club has been partly obscured by the attention unconsciously paid to other matters which have no direct connexion with photography. This state of things will be speedily reversed, no doubt, and we hope to shortly see the Club in its position of a dozen years ago, when its photographic vitality and authority were such fine features of its proceedings. We wish the new Camera Club the utmost success, and can promise it our heartiest support.

* * *

The R.P.S. Annual Report. The Report of the Council for the year 1900, to be presented to members at the Annual General Meeting on Tuesday evening next, shows that the roll of the Royal Photographic Society now reaches the very large number of 845—an increase of 65 since January 1, 1900. These figures indicate that the Society is far and away the largest of its kind in the world. A perusal of the report gives us the impression that during the year 1900 the Society performed a vast mass of useful work in furtherance of its main object, the advancement of photography. It calls for no comment in detail, and a that we immediately wish in this connexion is that the ye 1901 may be, for the old Society, as prosperous as its imm diate predecessor. With regard to the Council election, t results of which will be declared on Tuesday, we regret t find that some well-known names will no longer be found i the list of the Executive. Sir Henry Trueman Wood, Pa President, who worked hard and conscientiously for t Society a few years ago, does not again stand for the Vic Presidency, whilst Mr. W. E. Debenham (one of the olde living members of the Society) and Mr. J. J. Vezey will l absent from the Council. These gentlemen have rendere great services to the Society in the past, and it is right th they should not be allowed to stand down without publ recognition of the fact. With these and other contemplate retirements, the Council this year will surely not be lackin in new blood. The Royal Photographic Society, which i two years' time will have existed for half a century, an will thus have the opportunity of indulging in a jubile celebration, appears to have entered upon an assured an settled career of prosperity. It is to be hoped that th power which will accrue to it in virtue of this increasin success will stimulate it to grapple with some of the in portant problems that have long waited for solution. W cite, in particular, the subject of examinations in phot graphy, and the reform of the Fellowship scheme.

* * *

Permanency of Sepia Platinotypes. In the JOURNAL of November 30 last, w referred to a question that had been raise as to the permanence of sepia-platinur prints, and a fortnight later we gave an article which deal with the theoretical aspects of the matter. The chemistr of the process is entirely favourable to the belief that sepi pictures in pigmented platinum are as permanent as photographic image can be. This admired process of makin photographs is so very popular nowadays that perhaps note of a practical experience on the stability of the imag may be of interest. The other day there was shown to u a large-sized print in sepia platinum which was made by th late Mr. F. W. Edwards. Those who can recall the wor of this very able architectural photographer may remembe that he was one of the earliest to take up sepia-platinu printing, and before it attracted such widespread attentic amongst pictorial photographers. The print that w shown to us was made fourteen years ago. Owing to r movals and other causes, it was overlooked for years, an for a part of the time it was kept in a disused room tha was somewhat damp. The frame was disintegrated, th mount had discoloured, but the deposited image had quit resisted the effects of time and the deleterious influences o the atmosphere, and was perfectly fresh and unaltered. Th print, we may say, is in the possession of the Platinotyp Company. Every photographic printing process has falle at times more or less under the suspicion of impermanence but an unchanged fourteen years' old sepia-platinum prin should supply ample evidence for disbelieving any allega tion that this particular process is affected by the bane o fugacity.

* * *

The Oxford Convention. The meeting of the Convention Counci which was held in London a few days ag discussed and settled the programme for the week whic begins on July 8 next. There will be excursions to War

vick, Banbury, and on the river, while Oxford itself, as ve have already pointed out, offers an unsurpassed field for photographic work. In this regard it is probable that pecial facilities for photographing the colleges and other istoric buildings will be granted to members. It is also ikely that the Oxford Convention will have an inter-national character, for there is talk of the presence of a ontingent representing the Union International de Photo-graphie, a peripatetic Continental body of photographers which has done good work in connexion with the Congress hat has met at Paris, Brussels, and other places. We hope hat this idea will be realised, for between British photo-graphers and their Continental confrères so little inter-ourse takes place that they work almost entirely in ignor-ance of each other's methods and aims. The gulf that eparates us from our foreign photographic friends has, if nything, widened since the death of Mr. Leon Warnerke, a entleman who in his time did much to enlighten the photo-graphers of this country as to the progress of affairs on the Continent. We are sure that, if any photographers from he other side of the Channel decide to be present at the Oxford Convention next July, they will receive a most ordial welcome, and will be fortunate in the opportunity of sing their cameras amidst surroundings difficult to excel or beauty, interest, and historical glories.

REDUCERS AND INTENSIFIERS.

A CORRESPONDENT, signing himself "Reducer," repeats a uery which is almost perennial, and we will endeavour in his place to answer it for the benefit of "Reducer" and many other companions in doubt. At the same time it must e stated that, in giving a selected series of formulæ, it must ot be supposed that they are superior to any others; the want described may be best satisfied by giving thorough working instructions for methods which we know to be dopted in large establishments, where it may be supposed nethods are adopted which stand the test of time and of ractical usefulness.

Taking reducers first, we may say it is now possible to ive one single solution, as since the introduction of one par-icular salt a new process has been placed in the hands of he photographer.

Every photographer should have by him a stock of Howard armer reducer, which is simply a mixture of ferricyanide of otassium with hypo solution; but, as it will not keep ready ixed, the best plan is to keep a stock of the ferricyanide solu-on, and make the reducer as required. A twenty per cent. olution is readily made, and should be stored. Then two unces of ferricyanide of potassium dissolved in water, and ade up to a bulk of half a pint will be all that is necessary. his is a salt that can be purchased at any chemist's, and very cheap. We are supposed to be giving instructions to ne possessed of no special apparatus; hence the following ints will be useful. As the salt, when purchased, will be good-sized crystals, it is better first to crush them, and his will be easily done by folding them in a piece of brown aper (quite slackly), and, then placing the parcel on a hard oor, hit it several times smartly with a hammer or flat iron. he whole will be reduced to small crystals directly. Place hem in a clean pint jug, and pour successive portions of ot water upon them till the whole is dissolved, pouring the solution from time into the half-pint bottle. Let it be labelled twenty per cent. ferricyanide of potassium solu-tion. When required for use, add it in the proportion of a drachm to each ounce of ordinary hypo solution. It is better to use fresh hypo solution, though, if pressed for time, some old fixing bath out of the stock solution will answer. All that is necessary is to place the negative in the reducer, and allow it to act till the right degree of density is at-tained. To judge this, the negative must be held up to the light from time to time to ensure the action being arrested when the negative is judged to be right. It is needful to give a caution here. When the negative is held up the solution will be found to run in streaks, and a series of stains following the streaks will be produced. To avoid this fault, the plate must be held up for a very brief instant of time only, and no dangers of stain need be apprehended. If the negative be very dense, a fresh lot of solution may need to be mixed, as the reducer rapidly loses its power when put to-gether. Still more quickly is this condition brought about when old hypo has been used. If the negative be only very slightly in need of reduction, it may be safest to mix it weaker, a reduction to two ounces of hypo solution will then be amply strong enough and there will be less fear of streaky marks. This reducer should only be used upon negatives which have had a full exposure, as it has a tendency to eat away the more delicate parts of the image. With dense, over-exposed plates the printing character is really bene-fited by the treatment, while for under-exposed negatives or those on the verge of under-exposure this reducer is not re-commended; it will make them print with still greater contrast, and, altogether, give to an almost correctly-exposed plate a character of under-exposure.

But, when the image is of this class, there remains a second reducer which is invaluable—the persulphate of ammonia. After well washing the plate it may be immersed in a solu-tion of the persulphate, which has the effect of dissolving the image away without interfering with the scales of grada-tion and greater or less contrast. They remain so virtually but it is, indeed, held by many that the scale is altered, that the higher lights are reduced to a greater extent in propor-tion than the lighter deposits. We will not here discuss which is the correct view, suffice it that its action is greatly different from that of the ferricyanide reducer, and renders it the most suitable for pictures under-exposed, or with a tendency in that direction. This salt is less commonly met with at the chemist's, and is, in fact, not often obtainable except from those who deal in photographic materials. It can be kept in solution, or a few crystals dissolved when re-quired. We prefer to keep it in solution, as all trouble of weighing is avoided, and we may at once state that accuracy is most desirable in gauging the strength of this reducer. It is usually stated that the solution will not keep; we can only say we have used a solution six months after being made, and have failed to find any impairment of its action. For all negatives of what might be termed ordinary over-density, a one per cent. solution is quite strong enough; hence a ten per cent. solution of the salt—an ounce in half a pint—is a useful strength. The crystals, being usually small and very soluble, may be put into the bottle, and the latter be at once filled up with water. One drachm to nine of water is the right proportion. The negative should be well washed, and placed in this either wet or dry. The use of this reducer is accompanied by a remarkable liability to stains and spots. After the negative has once been placed in the solution, it

should be most carefully handled when removing it for execution. By one corner is the best way to hold it, and always the same corner. If this precaution be not taken, stains will often be found to start from the place where the fingers have been some distance along. Then, again, if the reduced negative be placed to wash, stains and marks are liable to be produced; but they are entirely avoided by placing the negative after reduction, and after a slight rinsing with water, in a solution of sulphite of soda, and allowing it to remain for about ten per cent. A five per cent. solution has been recommended; our own practice is to use a nearly saturated solution that is about twenty per cent. If left in this for about a quarter of an hour or twenty minutes, it may be put to wash. In our own practice we, for the sake of still further preventing stains as interfering with the stability, find it desirable to finish off operations by placing the negative in the hypo bath for five to ten minutes, though, if a twenty per cent. solution have been used, twenty minutes appears to free the negative from all substance liable to produce a stain. Finally, of course, the plate is thoroughly washed. The above details are thoroughly practical, and should be always attended to. With regard to intensifiers, we will defer their consideration to a future number, as the space already occupied is more than is desirable.

SHOULD NEGATIVES BE VARNISHED?

During a discussion on varnishes at one of the London Societies a short time back, the report says, it was incidentally remarked by one of the members that very few photographers now varnished their negatives at all. We are inclined to the same opinion ourselves, for, if all gelatine negatives were varnished, the sale of photographic varnishes would be an important item with the dealers, as compared with what it was in the collodion days, when every negative had, perforce, to be varnished before it could be printed from. But has the consumption of the article increased in proportion as photography has expanded, or has it not rather decreased? When one negative (collodion) was made, say, a couple of decades ago, twenty—perhaps fifty—are produced now, and has the manufacture of negative varnish increased proportionately? We trow not; and we may take that as a practical evidence that the great majority of those who produce gelatine negatives do not varnish them. But why? With collodion, varnishing the negatives was imperative, because, by reason of the thinness and tenderness of the film, a single print could not be got from them without great risk of injury or ruin. With gelatine the case is different, as the surface of the negative is almost as hard as that of some of the varnishes that used to be sold; hence it requires no protection against mechanical injury. It is for this reason that so comparatively few negatives are now varnished. Do they not, however, require protection in another way, namely, against atmospheric and chemical injuries? The answer to that is the large number of silver-stained negatives there are now in existence, and the number of queries we and others have to reply to as to how stains can be removed. In nineteen cases out of twenty the stains would have been avoided had the negatives been varnished in the first instance. It is noteworthy that, where a negative has been retouched, and the retouching has been done on a "medium," there is seldom, if ever, any staining where it has been applied, though the other parts may be badly stained. This shows that even this attenuated film of resinous matter has afforded a certain amount of protection. It will, we think, be generally conceded that stained negatives are more common when they are printed from in winter than they are with summer printing, and it may be accounted for in the following way. In dull and cold weather the frames are frequently exposed out of doors, where they get very cold. They are then taken into a warm room for the paper to be changed. When the frame is opened, moisture, as dew immediately condenses upon the negative, and when the paper is put on this the moisture is imprisoned and is absorbed, partly by the gelatine of the negative and partly by the paper. When this is repeated, say, a dozen times, as it is when a dozen prints are required, a considerable amount of moisture becomes taken up by the negative. In this way we get a damp film which often contains a trace of hypo—sometimes more than a mere trace—and on this is placed paper containing free nitrate of silver, and, in the case of gelatine and collodion papers, an organic acid as well. What wonder, then, under these conditions, if the negatives become stained? The stains may not become apparent at once, but they may appear afterwards. It is no uncommon thing for negatives that show no staining when they are stored away to be found badly stained when they are required again, and after a few months' keeping. Furthermore, these stains are often more difficult of removal than are those which make their appearance at once and are dealt with forthwith, as, by the long keeping, they seem to have penetrated more deeply in the film. Now, if the negatives were varnished, moisture condensing upon them would not be absorbed, as the varnish is repellent of moisture; it would be taken up by the paper, where it would, practically, do no harm.

Why, then, it may be asked, do so comparatively few photographers varnish their negatives, particularly when we consider that no one—whether professional or amateur—can tell how soon a negative he possesses may become exceedingly valuable? There can be but one answer to this, it entails a little more trouble—for the varnish itself is a very inexpensive article. The trouble and labour involved in varnishing is very trifling, as a dozen negatives can be varnished in as many minutes—far less time than it often takes to remove stains, when they are formed, from a single one, and sometimes they cannot be removed at all. Added to this, when the stains can be got off, the retouching generally comes off too, and that, of course, has to be redone—a further trouble and, perhaps, expense.

As a practical illustration of the protection—chemical—afforded by varnish, it was mentioned at the meeting referred to just now that, when some experiments were made with a new reducing agent, the negative remained in it for some hours without any effect whatever upon it. Afterwards it was discovered that the negative had been varnished; this clearly proves the protection that is given by a coating of resinous varnish to a gelatine film.

One of the principal reasons why so many amateurs do not varnish their negatives, no doubt, is the difficulty they find in getting the varnish to flow freely over the plate. There is no question that varnish does not take so kindly to a gelatine film as it does to one of collodion, but with a little practice this is easily overcome. If, however, the plate be first flowed over with methylated spirit and then allowed to

dry. the varnish will flow over much more freely than it would have done without that treatment.

This article has already extended to too great a length for us now to say what we intended on varnishes and varnishing, so that a portion of the subject must be deferred for a future occasion.

THE SINGLE-PRINT AND HOLLINGER'S METHOD.

One of the most interesting—and most hopeful—of recent tendencies in photography is the custom, now proven successful in America, of attaching a special and individual value to a photographic print. This happy custom has been so long obsolete that most photographers regard it as entirely new; it was, of necessity, the rule in Daguerreotype days, and it survived during the early flourishing period of the *carte-de-visite*. But the advent of too much ease in photographic working led to dozen rates and price-cutting, and for more years than we care to think of the average photographer has been a struggling man.

The revival of the single-print idea, though previously attempted, is really due to Hollinger, of New York—he was Hollinger of a small Ohio city when he elaborated his plans.

Much has been written of Hollinger and his methods; his luck has been much envied, and it is commonly supposed that he has—in Yankee parlance—struck oil. But the facts show that the man has won his position, and his undoubted pecuniary reward, not by any adventitious stroke of luck, but by sheer and solid hard work, which has been pursued, not for months, but for years.

Hollinger has worked, as he is fond of recounting, behind a cheap tintype "machine." But that he was born some 800 miles inland, he would, doubtless, have been a beach photographer. From tintype work he passed to silver paper, and became the despair of his brother photographers, for he boasted himself the champion cut-price man, and seemed to take an unholy delight in rendering futile any efforts to maintain prices or form a "ring." But photographing farmers and small traders is a limited business, especially when prices are chronically slaughtered, and all babies taken free, and Hollinger, in planning a move, dreamed of the room which is ever at the top of the tree. He pored over the question earnestly, and he pored over it long. He had the technique of photography at his finger-ends, and he went strong for the art side. And he did not do it by "studying" the works of the leading photographers, but he went after all the paintings, and prints, and the relevant reading matter that he could lay his hands on. He, in a measure, permeated himself with this new anointing, and if he passed through the callow stage—as so a few Americans are at present blatantly doing—he passed it in silence, and quietly digested and arranged his somewhat mixed learnings.

Ohio is among states what Yorkshire or Devon are among counties. It boasts itself no mean state, and "Ohio boys" are supposed to be as ubiquitous and as successful as Scotchmen. However that may be, Ohio has a very live Photographers' Association, and they usually have a successful annual Convention and exhibition of work. About this special Convention, and the "school" which it has raised, more, perhaps, anon. Many Ohio workers regularly enter the lists with their works, as they do too at the National Convention, and in due season Hollinger exhibited his newer creations, which were promptly treated to the American equivalent of "skying." In spite of their obscure position, they were discovered by F. Dundas Todd, and through the *Photo Beacon* the American photographers first knew of the Ohio man who was setting a new pace. Hollinger had been carefully planning a new campaign, and, having placed himself well on the higher branches of the tree, he determined to challenge "the centre of things," and boldly investigated Fifth Avenue, New York. His business methods were sound, and such as would prove advantageous to very many photographers. For instance, his prints are invariably ready "the day after to-morrow." But it is with his camera and price methods, as applied to his single-print idea, that we are at present interested. The first invariable rule—all rules are invariable, for he the most courteous and most inflexible of men—is that he and the sitter alone enter his east light studio. Fond parents and chaperones are alike consigned to waiting, until the sitting is finished, and the photographer satisfied. The *per capita* number of plates used must delight the heart of the plate-maker. It is commonly said that thirteen exposures are usually made; but there is no fixed rule. Sometimes eight or ten exposures are made, sometimes thirty. The thirteen refers to developing. Hollinger tells us that he uses a dish which will hold just the unlucky number, and that he develops a dishful at once.

When sufficiently developed (and this appears to be decided by sheer experience, and in a manner mysterious to the uninitiated watcher), the developer is poured off and hypo poured on. Of course, such a procedure is terribly unorthodox, but it is labour-saving and effective. The negatives as they come from the developer look wretched examples from the old pluck and detail standpoint, but they are what is required. Retouching is crude and slight. A bad pinhole is not carefully stippled out, but is treated with a dab of colour as though done with a soft fountain pen, or a few very vigorous strokes may be made on the unvarnished film with a soft pencil. And the work is done as the negative is held against the window for examination. So far there is much that is unusual, but nothing which may be termed startling. But in his method of submitting proofs, and his method of making sales, Hollinger shows a soundness and a breadth which might with advantage be more widely followed in the profession. "Rough prints," are unknown to Hollinger's customers. Platinotype is the printing process almost invariably used, and every print is perfectly finished and mounted on a cream paper of heavy weight (not quite stout enough to stand), measuring $13 \times 10\frac{1}{2}$ inches. The prints are trimmed as deemed best, and from a dozen negatives there are often no two alike.

Surrounding the print is a tint slightly darker than the rest of the mount. This tint, which is printed or washed on, not pasted down, is of home placing, and so can exactly set off the print, whatever the size may be. Each mounted print is enclosed in a portfolio of stiff card buff-coloured, and "imitation crocodile" in texture. The number of prints submitted is entirely according to the judgment of the photographer. He may make thirty negatives and submit but half-a-dozen prints. Not that he makes a great number of exposures in order to achieve a few chance successes, for Hollinger is too much master of his work for that; but, as a general thing, a fair number of prints are submitted—no duplicates, but one finished print from each of a number of negatives. They are sent to the customer absolutely on approval. There is no compulsion to buy a single copy if the work is not appreciated. Any copy kept is charged five dollars (and five dollars is between a sovereign and a guinea in value). Duplicates cost three and a half dollars each, but this does not apply to prints from different negatives, only to second or later copies from any negative. Thus twelve finished prints might cost sixty dollars, or a dozen from one negative would cost forty-three dollars and a half, the first one being reckoned at five dollars. This is by no means a bad price for cabinet platinotypes. There is absolutely no second price. The pictures may be kept or returned. If returned, they are quietly torn up and put in the waste-paper basket. But such a fate is much rarer than would be imagined.

The difficulty of selection seems insurmountable; there is something distinctive in every print that suggests its retention. There is absolutely no deception; Hollinger lets his work speak for itself, and, if it does not create and hold its interest, back it can come. People of wealth send their cheques; people of slender means keep more pictures than they can afford, and retrench in some other direction. The giving-away question, too, is a poser. People do not care to give away a print which leaves them without that special pose; and so the duplicate feature assumes satisfactory proportions, and, of course, at fourteen and sixpence a print it pays. Hollinger is not a man in a groove. His enlargements and reproductions from old Daguerreotypes, ambrotypes, faded silver prints, and other similar ancient relics, are such as few men can equal. He does not sign every print that goes out, but his name is unobtrusively blind blocked into one of the lower corners. But this is the mere labour-saving device of a busy man, for he is perfectly ready to append his pencil signature to any print which leaves the studio. Mr. Hollinger has taught photo-

graphers a needed lesson in his successful step from price-cutting to an inflexible stand for the highest price. He does not shriek artist photographer, but he does say, "If you wish my work you must pay my price; if you prefer a dozen for the price of one, you are prefectly free to go elsewhere." If a thing is well done, it is worth its price; and Hollinger carries this right through. His speciality is the five-dollar cabinet. For each increase in size he charges an extra five dollars until the seventh size comes somewhere near 22 × 17, costing thirty-five dollars. A coloured miniature may be had if ordered—fifteen guineas—and so the possibilities continue.

The feasibility of such a system, applied to a large commercial business, is extremely problematical. Hollinger's staff is eight—all from his native state of Ohio—and eight fill the premises, so there will be no addition. It is essentially a business founded on a personality, the most delightful of all businesses to a man of the right temperament. Others have tried the same system, and with varying success. They have seen the succeeding of the plan without grasping its wherefore. It is impossible to fool the people for long, and no mediocre workman can render his work fashionable and remunerative by merely asking an exorbitant price.

Hollinger's trump card, with which he invaded New York, was the ndividuality and consistent high level of his work. But added to this there was a shrewd business head, trained, but not intimidated, in the hard school of adversity. Every detail was carefully planned. The very show case—most important and most neglected of photographic accessories—had thought bestowed upon it a recounting of which would warrant a special article to itself. And no move was made until the time was ripe, a rare virtue in America where brilliant schemes suffer a mushroom existence, through a "half-baked" birth. The mere business details need not be recounted, enough that they are sound.

The single-print success has not been copied (or only very slightly) in its entirety. But it has had its influence on many workers, and has done much towards more care in printing and mounting. The idea of charging for a sitting, including a limited number of prints, is a direct outcome of this method, and is a practice much in favour among those newer workers who have invaded the profession from the amateur side. Mrs. Kasebier charges ten dollars and gives two prints. Miss Ben Yusuf for the same charge makes three prints.

Among the general run of photographers in large cities a leading line, usually at a dollar, is becoming more popular. Often two or three pictures, from separate poses, carefully printed and neatly mounted, are given, and such good value is the work that one can only hope that the, presumably expected, repeats are numerous and remunerative. As an example by contrast, a firm just a mile from Hollinger offer four midgets for one shilling. They show good posing, careful lighting, and negative-making, and careful printing and mounting. It is said that their makers are financially successful, and they deserve it.

William E. Ward.

PHOTOGRAPHY FOR A PURPOSE.

Photography forms no exception to the general rule, that after the first novelty of adoption and acquaintance has worn off a reaction should set in, and the first enthusiasm become toned down, sometimes to a colourless vanishing point. The new broom sweeps less and less clean as it loses its crisp newness. This cannot be helped, it is too characteristically human. If original interest, tempered down to more steady and effective working condition, follow in turn the reaction, it does not matter much. But there is a danger that it may not in the case of photography, for, as a pursuit more essential to the actual gaining of bread and cheese, it lacks the measure of compulsion that has meant success in many another direction under similar circumstances. The lawyer or doctor feels the same staleness towards work after the exhaustion of the stimulus of first interest; but, spite of that, he has to keep on with it, and further acquaintance brings the steadier interest, bringing more solid reward. He gets his sustaining professional "second wind," as it were. It may be advanced that a prospective worker in the photographic field so short of resolution and application is not worth looking after and trying to retain. Possibly so in many cases, but human nature is a queer sort of thing, and academic rules do not by any means bring their expected and calculated results in dealing with it. Many a successful man deservedly filling a high position can remember a point in his early struggling at which he would have gone under had it not been for some encouraging and helpful word or act upon the part of a friend, or some new and stimulating point of view upon his own. Many a one who would have done good work in photography has been lost owing to the effect of the reaction referred to. He found that results apparently so easy to gain were far from being so. The same round of unceasing mechanical operations of developing, fixing, printing, toning, and mounting palled upon him, and the dark room had too depressing an effect upon his spirits. They are all trying enough oftentimes if the final result be satisfactory, but doubly so if disappointing. Even after looking through his selected stock of best negatives, their interest-dispelling variety is very apt to bring a cui bono feeling and a slackening, if not giving up, of work. The same doubt is pressed uncomfortably home to many who have advanced far beyond any initial stage. The work lacks the solidity and comfort of a plan. Too wide a field has been traversed. Like an ill-dressed shop window, although the various articles exposed in it may be very good and valuable, it conveys no salient impression. As supplying this missing element it is suggested that photography, instead of being regarded in a dilettante light as the mere elegant solace of idle hours otherwise difficult to fill up, should take a more deserving place as a means to a definite end; that it should be photography for a purpose.

There are very few—so few that they may safely be left out of consideration—who have not a more or less pronounced liking for some thing or other. The emphasising of this, whatever it may be, and in whatever fashion, means increased pleasure in life. Photography can markedly help out the effort. A man, say, as a botanist finds his pleasure in the structures and differences of flowers, herbs, and trees, and the special and peculiar functions they betoken; or, without being a botanist, his artistic leanings run into the particular groove of admiration of their graceful beauty. Both can add a wonderful extra value and pleasure to their already pleasant world by the aid of the camera. An album of flowers, taken to illustrate botanical orders and rules, or to exhibit the growth and grace of trees, would surely form a highly prized possession. A third may be more susceptible to the influence of flowers and trees in a less scientific, less artistic, but even more subtle way. He is vaguely, but powerfully, affected by the ethereal other world suggestions conveyed by infrequent splashes of colour, chequered shadows, the faint scent of the pines on the ridge or the beeches in the glade. It would be a pity to lose such spirit-soothing and soul-refreshing elements as these in any attempt at materialising their causes. He who is fortunate enough to be susceptible to such influences must turn to another corner of his personality for something else to which photography can lend more proportionate aid. As extremes meet in mental characteristics as much as physical personalities, it is not unlikely that he may have a contrasting touch of something material enough to make him a stamp or coin collector. Here photography has a fine range. The highest joy of the philatelist or numismatist, we will admit, is that of possession of a rare original. But coming exceedingly close to, and strengthening it, is the secondary pleasure of making the fact of possession known, partly from genuine interest in the subject, partly to display higher knowledge, keener search, clever bargaining, good luck, or length of purse. As he cannot be expected to allow a rare coin or stamp to travel about in strange hands, a photograph would just suit the purpose. Again, a carefully arranged album of photographs would be an extremely fine complement to the originals in case or book, and could be arranged to telling advantage to illustrate special periods and issues, commoner examples in groups, a rare one given a page to itself to emphasise value, and so on. Interleaving for notes and description is also very practicable. In short, there is no reason why, granted full knowledge and a dash of literary faculty, the album, started for personal pleasure, might not blossom out into a book worthy of publication for the information and delectation of the world at large.

"Coins be hanged! They are too fiddle-de-dee for me! I want to lift a barrel, would have breadth, suggestions of space and air!" There is no reason why they should not be got. Photography is eminently available for the getting, in landscape, long reaches of river and ships that have been around the world. An album of English landscapes, if judgment and artistic taste have been used in their gaining, would be well worth looking at. A north-country landscape would act as a fine foil to a Devonian, or vice versa, according to where a man's soul

ained its first best impression, generally the same place as that the ul's casing got its first firmness of growth. There are a hundred fferent ways, and all interesting, in which the endless variety of ngland, and things all purely English, would be photographically ustrated—artistic scenery, expressions of manufacturing industry, ads, rivers, houses, vehicles, men and women. So wide is the field, though only one particular set of things be sought, that it will robably prove out of the question for the ordinary purse in the ocket of the ordinary man, with so many hours' work a day to be t through. Holidays there are, of course, and these could un-ubtedly be much sweetened to the majority by holding within their mpass the opportunity of adding a few well-chosen bricks to such a hotographic edifice as suggested. But outside of this, as filling up the best but a twelfth of the year, and well within the reach of an dinary individual, there is work for a lifetime of average length ithin easy bicycling reach of any place in the kingdom. We have ferred to ships, for instance. There is no country in the world where ve of a ship and all that a ship can suggest of the further corners f the world, and the getting to them, rules stronger than in England. here is no country in the world that can gratify the love by offering many opportunities of seeing ships. An album of ships, including verything possible under sail or steam, would be the very thing to ne with salt in his blood. It would be prized if the work were done y some one else, but immeasurably more so if done by himself. Along ne broad waterways running into our country processions of craft of ll sorts and sizes, from a coasting lugger to a 5000 ton steamboat, lide slowly along with every tide. They are photographable, although ot readily so, for the worker cannot get nearer than the edge of the ank, and the ship does not hug the bank closer than she can help. till, a little local knowledge of position, and the deep water channels, an accomplish much more than would appear possible at first sight, nd the picture when got is worth getting, for it is of a ship moving aturally upon her appointed path, a very different thing to being ooored against a dock wall. Tele-photography could be utilised to reat purpose in this direction. Under favourable conditions snap-ots are readily practicable. The difficulty would be in obtaining ccurate focussing, and this should also be practicable by the method ggested by Traill Taylor, of fixing a small telescope to the camera, move in and out with the racking motion, and with a focus care-lly adjusted to that of the lens. It is not easy work; but it is not sy work that is being advocated, but satisfying work of enduring in-rest, which never is, has been, or ever will be, in this world, easy. has, however, the great qualification of calling for the use of brains. et any one who has the liking try the river bank on a summer orning or evening, and watch his opportunities closely. He will be rprised at his success, measured at the season's end, and at the eneral broadening of thoughts and ideas, general as well as photo-raphic.

The inland dweller, oftentimes more impressionable to thoughts of ne sea and its ships than even he who lives on the shore, is, of course, ut of it in seeking to give practical expression to his liking. But here are farms, wayside inns, bridges, brooks, canals, barges, stiles, ross roads, and cottages ready to hand and plan.

If any one be so unsentimental as to be out of complete touch ith any such interesting points of contact with the more material orld pressing upon him on every side, there is still some hope and kelihood that he may feel interested in his fellow-men. There is oble ground for an album of types of men, ranging from a titled idler a tramp—also an idler. But this is too much, the photographic illennium has not yet come; we must be satisfied with a humanly ossible section, "workers," say, or "idlers." Supposing a man could roduce true photographic pictures of the typical workers of England, rm labourer, cotton spinner, collier, shopkeeper, engine driver, guard, oliceman—for we will include him amongst the "workers"—who uld appraise their value? and who could estimate the interest of ne one engaged in the work? Or, upon the other hand, amongst the idlers," pictures of a score of genuine tramps would form an album hat any man might be proud of. They ought to be available at a hilling a piece—the tramps we mean, not the album. It is not ex-ensive, a pound for the lot. If their histories could be jotted down n the opposite page, they would be cheap at a pound a piece. As lies, hey would be guaranteed as the polished work of experts, dealing ith the systematic side of human nature, and the occasional grains f truth amongst the chaff would be extremely interesting, if not also athetic, in explaining the pictures of the life failures opposite.

Instances could be quoted indefinitely to prove our point, which still, we trust, is indicated with fair clearness by those already given, that the discouraging effect, begetting listlessness due to aimless, though artistic, roaming in photographic work, would be replaced by strong nervous and interesting work, if the effort were instead to utilise photgraphy, to give solidity to a definite and pleasing purpose. This aspect of photography may serve an additional, and even brighter, purpose. There are many minds filled with a nebulous power that in such a form is useless; crystallised by the means suggested into a definite form, it would be a source of high individual gain outside of photographic considerations, and, incidentally, lead to telling photographic work.

CLOUD NEGATIVES FOR DOUBLE PRINTING.

However commendable and useful a cloudless sky may be to the novelist when he has his heroine abroad in some flimsy material that sets off her shapely form to perfection, it is far otherwise to the photographer when he is dealing with prints from landscape negatives. Anything more nauseating than a landscape print with the sky portion suggesting "This space to be let for advertising purposes" it is difficult to imagine. Large publishing houses recognise the importance of sending out all their landscape prints, perhaps not suitably clouded, but clouded at least with more or less merit. It is not so with the majority of photographers who do a mixed business; either from carelessness or incapacity, any landscape prints issued by them are generally unsatisfactory owing to the inattention paid to the sky portion. True, this portion of the print is not, in these days of gelatine plates, perfectly, glaringly white as in the time of collodion, but the uniform grey tint of the present time is quite as damaging to the general effect of the print as was the bald portion of the former. When the grey tint of the sky portion has been broken up by clouds clumsily manufactured out of cotton-wool or streaks of paint, the effect becomes even worse, and is ludicrous or pathetic, according to the temperament of the beholder.

Where landscape work forms a considerable portion of the photographer's business, it is worth while his endeavouring to procure clouds in the original negative, and so obviate the necessity of double printing. This is quite a simple matter if a good orthochromatic plate and carefully selected light filter are used; the exposure need not be more than a couple of seconds, and the slight movement of the clouds during this time is not sufficient to destroy their form. If, on development, the sky portion of the negative is found to be too dense to print conjointly with the landscape portion, it should be carefully reduced until its density is suitably matched with the rest of the negative. Of course, to obtain clouds in a landscape negative, they must exist in the landscape itself, and fine photographic days, with good clouds floating in the sky, are far more infrequent than is generally supposed. The photographer will find that about seventy-five per cent. of his landscape subjects will require clouds printed in them from separate cloud negatives, and it is well for him to bow to this necessity, and provide for it a selection of specially made cloud negatives.

The first step in the production of cloud negatives is to secure the originals, as the secret of successful and expeditious printing in of clouds lies in using carefully made reproductions from good originals. The clouds to be watched for are those massive cumuli that occur in disturbed weather about the times of the equinoxes, though they are not peculiar to these periods. A day when such clouds are present in the sky should be made the most of, as the opportunity, once lost, may not readily recur, especially in the vicinity of large towns. An elevated standpoint is desirable in order that a low horizon may be obtained without having to resort to tilting the camera; if rising ground is available, this forms the most eligible field for operations; but, failing this, an upstairs window may be resorted to if it commands a clear view of the sky, or a church tower. Wherever the standpoint be fixed, it should be seen that no lofty objects obtrude themselves into the sky, as an unbroken horizon is far more manageable. The lighting of clouds should be carefully considered; flat map-like clouds are as little to be desired as the same effect in a landscape. Endeavour to have them illuminated from the sun either on the right or on the left hand, as this effect of lighting is the one most commonly adopted when taking the landscape negative; the clouds will then have plenty of roundness in them; and, if they are taken with both right and left-hand lighting, it becomes easy to print clouds in the landscape having the same system of lighting, and so avoid sending

but the anomaly of a print in which the landscape is lit from a sun on the right hand, while the clouds are lit from another orb on the left hand.

For this class of work isochromatic plates are to be preferred, and a good light filter, as the clouds, when using these, are more readily separated from the blue sky. The lens need not be of the extraordinarily long focus that is usually recommended for this class of work, for the cumuli clouds favourable for the production of cloud negatives are mostly of very considerable size, and generally float fairly near the earth's surface. A lens whose focus is double the length of the plate used will be quite long enough, and it is well to be provided with a second having a shorter focus. The exposure must be the result of experiment, and requires rather nicely timing; over-exposure, naturally, means failure in this class of work, while under-exposure is equally undesirable, as by it the delicate gradation of the clouds is lost. When developed, the clouds should stand pluckily out against the blue sky background, which, in the developer, should be just covered over by deposit.

Satisfactory originals having been obtained, carbon transparencies are made, from which to obtain the reproductions. In printing these transparencies the exposure must not be curtailed, but sufficient to give the whole of the gradation contained in the original. The cloud negatives for use in double-printing are most conveniently made on gelatine plates, though, of course, wet collodion may be used, or carbon negatives even, made from the transparencies. A slow, clean-working gelatine plate is exposed in the copying camera to the cloud transparency just long enough to get the white cloud (or clouds) with its gradation; while the remainder of the plate remains unimpressed by what represents the blue sky, or, at least, is impressed to a slight degree only. The developer must work very clean indeed; if pyrogallol is used, metabisulphite of potassium should be added in equal proportion, and a liberal addition of extra bromide. Perhaps the best developer is hydroquinone (for this class of negative), and the following formula is very suitable:—

A	Hydroquinone	60 grains.
	Sulphite of soda	480 grains.
	Distilled water	10 ounces.
B	Carbonate potash	960 grains.
	Bromide potassium	45 grains.
	Distilled water	10 ounces.

To develop, take of each equal parts. Fix the plate in an acid fixing bath, and on removing it from this the cloud, or clouds, should exist with all their gradation against a background of clean gelatine. If any marked deposit occurs in what originally was the sky portion of the negative, it should be removed by the application of the ferricyanide reducer, though the necessity of having to resort to the operation of reducing is rather to be avoided, as it endangers staining the film with the ferricyanide.

Such a cloud negative as the one here described will, if successfully produced, print in a remarkably short space of time, yet print vigorously, giving a cloud effect of great brilliance and gradation against a sky of dark tone, the effect being perfectly true to nature. One mistake should be guarded against, which is to print clouds into, say, a cabinet print from a 12×10 cloud negative. Having the cloud transparencies, it is easy to make, by reduction or enlargement, negatives whose sizes match those of the prints. The cloud negatives are best preserved by coating them with enamel-collodion, which course is better, in this instance, than varnishing them, as the constant friction of passing the prints to and fro is apt to cause abrasion of the varnished surface, which at once shows on the print. The cloud negatives should be marked with a formula indicating their lighting—C.L. or C.R. (clouds lit from left or right); there will then be no error made when printing them into the landscape.

George T. Harris.

SOME NOTES ON DEVELOPER FORMULÆ.

It does not require a lengthy examination of photographic formulæ to arrive at the conclusion that the standardisation of some method of publication is much to be desired. In these columns and elsewhere the diversity of methods now in use has been often deplored, but the millennium when each formulæ-maker will conform to pattern is not yet in sight. Hence it may be of interest to discuss some of the defects of prevalent systems.

When a formula is adopted and recommended by a plate-maker, the obvious assumption is that he will see it is to his interest to publish it in its simplest form, for simplicity is attractive in a formula, if not in business circles. The simpler the formula the more readily the practical photographer will be induced to try it, even if prejudiced in favour of some pet developer of his own. It is patent that plate-makers desire to recommend the solutions which give the best possible result when used in conjunction with their goods, but the characteristic of the formulæ which they present is frequently an absence of simplicity, even when simplicity can be easily attained. For example, take such a formula as this:—

A.	Eikonogen	128 grains.
	Sodium sulphite	1 ounce.
	Warm water	16 ounces.
B.	Sodium carbonate	1½ ounces.
	Water	10 ounces.

Take three parts A and one part B.

To determine mentally how many grains of the various ingredients go to the ounce of this developer is puzzling, but it seems possible to write the formula thus:—

A.	Eikonogen	480 grains (one ounce).
	Sodium sulphite	3¾ ounces.
	Water to	60 ounces.
B.	Sodium carbonate	3 ounces.
	Water to	20 ounces.

Three parts A to one part B,

in which form the proportions are apparent to the eye.

One of the commonest institutions is the stock solution. As a handy means of storing solutions in reduced bulk, and of incidentally possessing a strong solution ready to hand if required, it has its advantages. But why begin the formula with it? Stock solutions do not appertain to the formula proper. They are simply conveniences. When the formula for the normal developer has been given in its entirety, the question of storage may be settled by observing that solution A may be conveniently made up in reduced bulk, if any one desires to do so, or if it keeps better so. Worse still are the formulæ with two or more stock solutions, for usually solution A has to be diluted differently from solution B, and the odds are that, when they are both diluted to the requisite degree, they have to be mixed in unequal portions, leaving a surplus of one or the other. To discover the composition of an ounce of the mixed developer is, under such circumstances, worthy the attention of a mathematician, but not of a practical photographer. The latter, whilst appreciating the convenience of stock solutions, prefers to have formulæ so presented to him that he can see at a glance how to modify them for any particular purpose.

The natural result of this perverse adoption of stock solutions as a necessary part of formulæ is that the total bulk of the normal developer when compounded as advised is not infrequently other than an integral number of fluid ounces. For instance, a developer which bulks 146⅔ ounces does not appear in a strikingly convenient form for those who are anxious to understand what the developer contains per ounce. Even when integral the bulk recommended may be two ounces or 400 or 500 ounces, which the standardisation of some bulk, say 160 ounces, would remedy. Of course, in mentioning the total bulk it is assumed that the water of the formula represents this. Publishers as often as not omit to state whether "water, 20 ounces," means that this quantity of water has to be taken and the other ingredients added to it, or whether "water to 20 ounces" is intended, which, of course, indicates the total bulk, and is more convenient. By the way, publishers of formulæ in "parts" should beware of scheduling one of the items in "drops." By unfortunate negligence in this matter one or two formulæ, apparently of an eminently practical nature, become somewhat delusive.

We now come to the system adopted for the weights of the ingredients. It is tacitly assumed that the ounce in a photographic formula is one of 480 grains (or drops), unless the ounce avoirdupois of 437½ grains is specified, notwithstanding that the ingredients are by custom retailed by the latter weight. For a business people to be obliged to buy a 437½ grain ounce when they require one of 480 grains is bad, but worse follows if they use the avoirdupois ounce unwittingly in place of the other. The result is naturally that solutions so compounded are nearly a tenth weaker than expected. As the adoption of avoirdupois weight has certain inconveniences in writing formulæ, it would prevent misapprehension if it were stated clearly on the formula that one-tenth more of the ingredients are

required when purchasing in avoirdupois ounces. This confusion furnishes a strong argument for the publication of all formulæ in the metric system, if one could only purchase the ingredients metrically too. It must be guarded against in converting grains per ounce into grammes per litre, for the factor by which drops must be multiplied is 25-12 if there are 480 to the ounce, or grains by 16-7 if the formula is written in avoirdupois.

A few suggestions may serve as recapitulation and conclusion. 1. The normal formula should be as simply written as possible, so that it may be compounded without any calculation whatever. If in two or more solutions, all the direction needed should be "Take equal parts," if possible. 2. To avoid misapprehension, the total bulk of the mixed developer should be mentioned. 3. Adjoining the formula it would be convenient to enumerate the number of grains and drops to be taken to make one ounce of developer. 4. The variation in the proportion of the ingredients advised when other than the normal developer is required may then be mentioned. And, 5. Subsequently, the most convenient may of making any stock solution for storage or other purpose may be detailed.

One of the advantages of such a system would be the facility with which a developer, for instance, could be made up in small quantities and in several grades if required; and it would certainly induce a trial of the "formula on the box," which frequently has a repellent aspect.

J. Dormer.

A STUDY OF THE CHEMISTRY OF REDUCTION BY MEANS OF PERSULPHATE.

[Translated from the "Photographische Correspondenz."]

The remarkable property possessed by the persulphates of attacking the silver of the photographic image primarily where the deposit is densest, and leaving chemical fog unaffected till the final stage, has been the subject of much inquiry.

It was first thought by Messrs. Lumière and Seyewetz, the discoverers of the ammonium persulphate reducer, that it resembled peroxide of hydrogen, by possessing, in addition to its powerful oxidising capacity, the qualities of a reducer. These experimentalists concluded that the black deposit formed, when a solution of silver nitrate is decomposed by persulphate in various degrees of concentration, consisted of metallic silver, according to the following equation:—

$$S_2O_8(NH_4)_2 + 2H_2O + 2AgNO_3 = 2SO_4HNH_4 + 2HNO_3 + Ag_2 + O_2$$

Upon the strength of this assumption, Lumière and Seyewetz offered the following explanation:—"When the negative is immersed in the solution of persulphate, the latter rapidly penetrates the gelatine film, and comes into contact with the silver. A small quantity of a double salt of silver is then formed, which diffuses itself in the excess of persulphate solution in which the plate is immersed. The persulphate, in presence of the soluble silver salt which has been formed, endeavours to reduce the silver; but this reaction of an opposite character occurs more particularly at the surface of the film, as the excess of persulphate necessary to effect reduction is there, and as the latter penetrates the film it becomes more enfeebled." Professor Namias criticised this explanation. He asserted that the deposit, formed by the action of persulphate upon silver nitrate, was not metallic silver, but sub-sulphate of silver, Ag_4SO_4, formed according to the following equation:—$(NH_4)_2S_2O_8 + 4AgNO_3 + 2H_2O = Ag_4SO_4 + (NH_4)_2SO_4 + O_2$. The sub-sulphate of silver deposited itself upon the particles of silver forming the image, and protected them from further action.

Besides these two equations, a third was proposed by N. Schoenchen, according to which the persulphate, in the presence of water, was converted to ammonium sulphate, sulphuric acid and oxygen, or ozone, which latter oxidised the silver in the nascent state. But this theory does not give any better explanation of the extraordinary action of the reducer.

D. Nyblin, of Helsingfors, has recently published a very remarkable paper concerning ammonium persulphate as a reducer, in which he disproves the theory of Lumière and Seyewetz, as well as that of Namias, by a very simple experiment.

Nyblin proves that the reduction with persulphate proceeds just the same if the back of the film is exposed through the glass before treatment. The reduction is not hindered at the surface by the excess of persulphate reducing the silver sulphate to the metallic state, as required by Lumière's theory, whilst on the other hand, the theory propounded by Namias does not explain why the denser parts of the image are attacked. If the sub-sulphate of silver precipitated upon the particles of metallic silver, the deposit would take place all over the film, but the experiment of reducing the image upon a film exposed through the glass shows that the action is not merely confined to the surface.

The fact that negatives reduced with persulphate show a marked relief, the deeper parts of which are situate where the persulphate has exerted most action, or, in other words, where most silver is present upon the plate, suggested the explanation to Nyblin, that the action of ammonium persulphate is due to its power to dissolve gelatine and silver. Nyblin placed an unexposed, fixed plate side by side with an exposed, developed, fixed plate, in a 10 per cent. solution of persulphate. After the solution had been allowed to act for some time, it was found that the film which contained silver had been completely dissolved, whilst that which consisted of gelatine only had been but slightly attacked. From this Nyblin inferred that, by the action of silver upon a solution of ammonium persulphate, a substance is formed which has the power of dissolving gelatine. As none of the formulæ which have been given appeared to be in harmony with the facts of the case, I set myself the task to ascertain in what manner the process in question takes place, and likewise the specific action of the persulphate, which is unique in the domain of photography.[1]

If $2\frac{1}{2}$ grammes of silver nitrate, dissolved in a little water, be added to 50 c. c. of a 20 per cent. solution of persulphate, a black precipitate will be formed in a few seconds. After a short time this will decompose and liberate a considerable quantity of oxygen and ozone. Part will redissolve slowly, and part will remain as a grey-black precipitate.

Vary the quantities, and add, for instance, 50 c. c. of a 10 per cent. solution of silver nitrate to 5 grammes of persulphate. No precipitate will be formed, and the colour of the solution will pass rapidly from yellow and brown to black. Ozonised oxygen will again be evolved in a short time, but after standing several hours the solution will be clear. Finally, if we take saturated solutions of both reagents, a white crystalline substance will be deposited, which is evidently persulphate of silver. Nevertheless, this will soon blacken, and emit oxygen. We shall probably be right in concluding that the black precipitate is peroxide of silver, and that the following reaction takes place:—

$$NH_4SO_4 + AgNO_3 = AgSO_4 + NH_4NO_3.$$
(Persulphate of Silver.)

The persulphate of silver then decomposes in the solution as follows:—

$$AgSO_4 + H_2O = AgO + H_2SO_4.$$
(Silver Peroxide.)

The silver peroxide is slowly converted to silver sulphate by the sulphuric acid, and gives off half its oxygen. If the solution is diluted, the silver sulphate remains in solution. In saturated solutions it is partly precipitated, and darkens under the action of light.

But this first series of experiments does not agree with the conditions as they exist in the process of the reduction of a negative, and can only serve as an indication of the chemical reaction. This, we have no doubt, takes place under the circumstances described in the manner expressed by the formulæ.

By the introduction of gelatine in the experiment, I obtained a very remarkable result. The reaction is totally changed, even if the silver is not mixed with the gelatine. It is quite unnecessary to dissolve the gelatine or to soak it in the solution. It suffices to dip the dry flakes of gelatine in the solution of persulphate, and to transfer them at once to the silver nitrate.

If we take 50 c. c. of a 20 per cent. solution of persulphate, add to it $2\frac{1}{2}$ grammes of gelatine, and then $2\frac{1}{2}$ grammes of silver nitrate, a pure white precipitate of silver persulphate is first formed. It is remarkable that this salt has an immediate oxidising action in the presence of gelatine, without any antecedent formation of peroxide. The oxidation develops a considerable amount of heat. The mixture, which at starting has only a temperature of 20°, rises to 55° after a lapse of twenty minutes, and then slowly cools down. In the absence of gelatine the transformation of silver persulphate to peroxide takes place without any appreciable evolution of heat.

In the course of this experiment the gelatine was totally destroyed, and an odour strongly reminding one of benzine aldehyde was observable. The raction was brisk, and the precipitate remained white

1 The statement of Professor Namias ("Photographische Correspondenz," 1900, p. 694), that permanganate acts similarly to persulphate upon gelatine negatives does not agree with my experience. Permanganate resembles more closely the ferricyanide of potassium and thio-sulphate reducer in its solvent action upon silver. (Note by the author, December 7, 1900.)

when it had terminated. After a time the precipitate (doubtless silver sulphate) turned brownish in colour by the action of light.

I have also ascertained the fact that other substances, such as starch, albumen, and gum arabic similarly arrest the immediate reduction of silver sulphate to peroxide, and that the oxidising process takes the same course as with gelatine. A comparison of the reaction of silver nitrate upon persulphate, and of the same solutions in the presence of a little alcohol, is very instructive. The alcohol is immediately converted by oxidation to aldehyde with considerable effect. By adding silver nitrate to the persulphate we obtain the reaction:—

$$AgSO_4 + H_2O = AgO + H_2SO_4.$$

But in the presence of oxidisable substances we have the reaction:—

$$2AgSO_4 + H_2O + \text{oxidisable substance} = Ag_2SO_4 + H_2SO_4 + O$$
(or oxidation product of the gelatine, &c.)

Finally, I should mention that, in the absence of silver, the action of the ammonium persulphate upon the gelatine is very slow indeed. In about an hour it will be seen that the flakes of gelatine have swollen considerably, and after three or four hours at ordinary temperatures solution is complete. It remains to be proved whether persulphate destroys the gelatine, other salts being solvents of gelatine without destructive action.

Having thus ascertained that persulphate of silver is a much more powerful oxidising agent than ammonium persulphate, the next step was to determine whether, in the use of metallic silver, the reaction upon the gelatine increased in strength with the quantity of silver present. The conditions under which reduction of the negative takes place, could only be approximated in the following manner. Quarter, 2½, and 5 grammes of $AgNO_3$ were reduced respectively with an alkaline solution of formic aldehyde. After thoroughly washing the precipitates, 50 c. c. of a 20 per cent. solution of persulphate and 2½ grammes of gelatine were added to each. An increase in the briskness of the reaction in proportion to the quantity of silver was observable. The sample of silver from the 5 grammes of nitrate exhibited in a few minutes an exceptionally brisk reaction. The gelatine was destroyed, and the temperature rose to 60°. The second sample of silver, obtained from the 2½ grammes of nitrate, only reached a temperature of 40°, and the smallest sample only brought about solution very slowly, and there was no perceptible evolution of heat.

Nyblin's hypothesis receives a certain amount of confirmation by these experiments. By the action of the persulphate upon the silver "a substance is formed which has the power of dissolving gelatine." This substance is persulphate of silver, which sets up oxidation with considerable activity. In those parts of the negative where most silver is present most persulphate will be formed, and there most gelatine will be dissolved or broken down. It likewise follows that the principal seat of action of the solution must be limited to those parts where the deposit of silver is greatest.

Although the action of persulphate may now appear more comprehensible by the light of these experiments, the principal reaction, which takes place in the process of reduction, nevertheless seems different, or at least to require some other explanation. If we take a collodio-bromide of silver negative, it will be observed that the process of reduction proceeds precisely the same as in the case of a gelatine negative.

In order to make an exact comparison, two negatives should be prepared as nearly as possible alike, one with gelatine and the other with collodio-bromide of silver emulsion. As the photographic character of collodion emulsion differs generally from that of a very sensitive gelatine plate, it is preferable to use a transparency plate. The collodion negative should be used wet, as the film becomes very impervious after drying. Reduction would consequently proceed much more slowly, and this might be deceptive.[2] If both negatives are then reduced side by side, it will be observed that the gelatine negative dissolves much more quickly than the collodion plate, but in the case of the latter the lights disappear first, and finally the shadows. We are therefore no longer able to ascribe much influence to the gelatine, although it may play an important part in the chemical reaction we have described. As neither the medium nor the processes of diffusion appear to have any influence, as shown by Nyblin's experiments, we must rest satisfied with the fact that the chemical reaction between metallic silver and persulphate does not depend solely upon the strength of the solution of persulphate, but increases with the quantity of silver.

By these experiments nothing positive has been brought to light in elucidation of the problem, and the Nyblin theory, which appeared to be the most useful, loses its validity. I trust, however, that I may have cleared the way for something better, by disproving a false hypothesis.

Dr. Luppo-Cramer.

Charlottenburg, October 3, 1900.

[2] Professor Namias asserted, in a paper read at the International Congress for Applied Chemistry and Photography, held at Paris, that persulphate has no action upon a collodion negative, which is disproved by my experiments; but, nevertheless, it is proved that there is considerable difference between the action of persulphate upon silver in the presence of gelatine and collodion. (See "Photographische Correspondenz," 1900, p. 694.) (Note by the author, November 10, 1900.)

THE LAMENT OF AN OLD PRO.

With Apologies to Longfellow.

Under a sombre velvet cloth the Photo Artist stands,
A man endowed with patience he, though acid-stained his hands;
You see the sweat upon his brow when he strives for an hour or more
To pacify some screaming brat—its image to secure.
Week in week out from morn till night he toils to pay his way,
And he finds no surplus over to meet the "rainy day;"
He thinks of palmy times long past, and fortunes quickly made;
Before the dry plates came in use to spoil the Photo Trade.

No church for him on Sunday, for he's now compelled to work;
To keep the show ageing, and the business dare not shirk;
What with the cutting prices and new processes we see,
To keep pace with the times, a shrewd man he must be.
As years speed on he feels the strain, and drops a bit behind,
In the race of life he's passed—now Fortune seems unkind.
He seems to lack that smartness, for he is not youthful now;
And care has marked his features, and shows furrows in his brow.

Toiling, hard-up, and borrowing, onward through life he goes;
Each morning tries some work to find, to pay the debts he owes:
His clothes are getting seedy, and the world begins to shun,
Forgetting all his past, and the work that he has done.
He's like a stranded vessel deserted on the main,
That drifts about life's ocean no port to reach again;
The billows of adversity close o'er him fierce and fast,
No friend comes to the rescue, in despair he sinks at last.

Cambridge, January, 1901. W. B.

Studio Gossip.

Protecting Patentees.—On Monday last, in the hall of the Incorporated Law Society, Mr. G. B. Ellis, solicitor and patent agent, read a paper pleading for the increased control of patent agents. He pointed out that all agents registered under the Act of 1888, who had been struck off for misconduct, continued to practise, except those who had died, while there was no control in the case of unregistered agents. The latter class was a small one, but he quoted bankruptcy proceedings in which an unregistered agent admitted defrauding in 553 cases. He suggested that, pending an Act of Parliament, rules might be formulated which would create the same relationship between patent agents and the Patent Office as that which existed between Parliamentary agents and the House. Parliamentary agents were controlled by Standing Orders, and it would not be hard to devise rules to regulate patent agents. Mr. J. Fletcher Moulton, M.P., who presided, said it was an object very much to be desired that those who acted as agents or inventors should be men of respectable character and proper qualifications. What Mr. Ellis proposed was that while the Patent Office should have no power to require intellectual capacity, as in the case of those who passed the registration examination, from those who practised as unregistered agents, it should have the right of satisfying itself that they were men of respectable character and not likely to defraud inventors. He saw no difficulty in carrying that into practice. It would mean that the number would be known to the Patent Office, some for good and some for evil. Those known for good would be allowed to practise—not calling themselves patent agents, but doing the work; those known for evil would be unable to continue the scandalous system that, he feared, went on too frequently at present. If the powers sought were put in the hands of the Patent Office, it would have two good effects; in the first place it would stop sharpers from taking the money of inventors and not doing the work, and it would gradually open the way towards making the profession a closed profession without any injustice to any now in practice.

Further Notes on Reversal Photography.—To our contemporary, "Nature," Prof. Francis E. Nipher contributes a letter on this subject in the course of which he recalls the fact that on a former occasion he called attention to the possible advantage of positive or reversed photography and development in the light in its application to eclipse work. Since that time very considerable improvement has been made in the

ethods, and it is now easy to develop, in direct sunlight, plates which ave been somewhat over exposed. The pictures obtained in this way are clear and sharp as any that can be obtained in the dark room by dinary methods. "But I have not been able to secure details on ich plates that cannot be secured on a negative by ordinary means. addition, the over-exposure needed in order to obtain a fine picture is t yet small enough to warrant the usefulness of reverse photography eclipses. In the measurement of the actinic values which are required yield various results on the photographic plates, a discovery has en made which will be of value in the development of eclipse photo-aphs. It has been found that a plate which has been over-exposed as uch as two thousand times can be developed as a clear, sharp negative the dark room. This can be done by the addition of four or five ops of saturated hypo solution to a two ounce bath of hydroquinone veloper. A half ounce of Camer's mixed hydroquinone bath with an nce and a half of water and five drops of the hypo solution in place the potassium bromide, gives clear and brilliant negatives, but they e slow in developing. They can probably be developed more quickly making the bath more strongly alkaline. With a normal exposure, e addition of two drops of hypo enormously retards the development. he plate may look perfectly clean for half an hour or more, but the cture will surly appear by giving it time and keeping the bath in solute darkness. It may require an hour and a half or more to secure mplete development. With experience, which may easily be obtained the use of the hypo developer there is no need that any valuable pho-graphic plate should ever be lost by over-exposure if a proper exposure as been attempted. If the plate cannot be replaced, and loss from er-exposure is possible, a trace of hypo should always be used at the art ni the developer. With the hypo developer it is possible to develop a Cramer "Crown" plate, either in the dark room or in the light om, any exposure not in excess of one million candle-meter-seconds e highest limit of exposure for the development of good negatives in e dark room is one which permits the devlopment of positives in the ght. A plate two thousand times over-exposed may be developed either a positive or as a negative." This communication, concludes Prof. ipher, has been made somewhat prematurely, in order to direct the tention of those who will take part in the work for the next eclipse to matter which may have great importance. It may be that the over-posures with which I have been dealing are less than has been stated. is, perhaps, open to question whether a fast plate under a thin posi-ve, and exposed in a printing frame for three-and-a-half minutes at one eter from a three-hundred-candle incandescent lamp, is two thousand mes over-exposed. There is, however, no difficulty in developing such plate as a negative.

Portraits of Men Only.—By the kindness of our confrère Mr. John Tennant, of New York, we have received a copy of an unconventional tle magazine, The Philistine, which professes to give, in the following rightly narrative, the reason why Mr. Pirie Macdonald, the well-known merican photographer, has abandoned making portraits of the gentle x:—Mr. Pirie Macdonald, formerly of Albany, but now of New York ty, is a photographer. He calls himself a Photographic Artist—and he He has more medals, and gets higher prices than any photographer America. His prices are as high as a church steeple. Pirie is the ly man I ever knew, or heard of, who made a fortune taking photo-aphs. He has his limit in every savings bank in Albany, owns a ock of flats, and sports an automobile in the park with a bull-dog tting beside him. Pirie of the Medals does not take everybody's cture—he picks his customers. As you enter his place he sizes you through a peep-hole from behind the arras, and, if your countenance cks a trace of the classic, Pirie signals his assistant, and you are in-rmed that Mr. Macdonald is in Europe and will not return for a ar and a half. Mr. Macdonald's specialty until recently has been ciety Belles—tall, lissome beauties, proud and haughty with a wond-us length of limb; these are the kind he liked best. And so famous Macdonald that sitters have come to him from Rochester, Potsdam, ambersburg, Rahway and all the country around and gladly paid the ice of one hundred simoleons for one portrait, done with that wonder-l Rembrandtesque effect, and signed by the artist. Often Pirie would nd the fair one home to change her dress, but, if her hair needed arranging, he always attended to that himself. Pirie's skill lay in sing his subject so to get the best result. He usually would sit down th his sitter and talk to her about this or that, and tell her stories, thetic or comic, and all the time he would be watching her coun-nance and debating in his mind whether he would pose her as a adonna, Sappho, Judith, Marguerite, or Queen Louise. The Judith-olifernes pose was his best, but it was often difficult to bring about e feeling that gave attitude. Women want to look pretty, and that as not what Pirie cared for; he desired chicity-chic, go, biff and éclat. this end he often had to resort to a scheme to bring the sitter out of r affected self-consciousness. "Look into my eyes," he would some-nes command: and when all else failed, Pirie would assume wrath, d declare "Here you—why in tarnation can't you do as I want you !" and he would clap one hand on the beauty's head and the other der her chin and give her a few sharp turns to windward, and end by ministering a sharp slap athwart her glutei maximus, to straighten r spine. By this time the woman would be simply furious, and eechless with rage. There she would sit bolt upright, ready to plode, but she was not given time to go off, for Pirie would step ck three steps and shout exultantly, "Splendid! Hold that—Hold at!" and then he would rush foward, kiss her on the cheek and back ain he would spring crying, "Hold that! Hold that!" and the bulb as pressed. And when all was over the artist was so penitent, so mble and beseeching in his manner, so profuse in his explanations at it was all in the interests of Art, that all was forgiven, for base indeed is that woman who is not willing to sacrifice her feelings on the altar of Divine Art. And thus did Pirie get that most wonderful "Salome," which was the wonder of the Paris Exposition, and was declared by the judges to be the strongest and most effective study in photography ever exhibited. In every line it showed such a fine feminine rage—such pride and smothered passion—that people looked at it in amazement. No one knew that Pirie had tumbled the woman's hair in one fell grab, and had thus aroused her wrath, and then offered her insult by kissing her, and so brought that fine look of burning shame and mingled rage to her proud face. It is a great picture, and it will pay you to step off at Albany the next time you are down that way and go to the State House and see it. But the Ideal continually recedes, and Pirie, having the true instinct of an artist, was fired with an ambition to do still better. The opportunity came, and Pirie, looking out through the peep-hole, beheld a woman, say of twenty-eight, five feet eleven, weight one hundred and sixty. Her beautiful and abundant hair was bleached, and she had the proud and self-reliant look of one who had conquests that lay behind, and others, greater still, within her grasp. Her neat-fitting jacket and tailor-made gown showed off her fine form to advantage. The strong features were pure Greek. Pirie almost screamed with delight, and hastily he ordered his assistant to be gone and leave the customer to him. "Oh! now we shall have a real Herodias now—that Paris picture will be only a tintype to this. My! what a splendid tiger she is." That is all we really know about the matter. The attendant improved the opportunity to go out on an errand and when the neighbours in the law office across the hall heard the commotion and rushed out they caught the swish of skirts and got a glimpse of a tailor-made gown going down the stairway. Pirie was found, panting and helpless, in a corner of the studio, with the black cloth viciously knotted around his neck, and the tripod, camera, and sitter's throne on top of him. There was a bad scalp wound extending from one ear to the crown of his head and it looked as though he had been struck with the lens. Pirie never made any statements about the matter, but now his card reads: Pirie Macdonald, Photographic Artist. Portraits of Men Only.

News and Notes.

The Members of the Royal Photographic Society and the Camera Club will learn with regret that Mr. Henry Everett, who was journalistically known at both institutions, died on the 25th ult.

The Hon. Sec. of the Hove Camera Club informs us that all medals and certificates awarded in the recent Exhibition have been forwarded to non-members. The next Exhibition will be held in November.

London and Provincial Photographic Association.—At the Meeting on the 14th inst., Mr. W. Thomas will read a paper. The Annual Supper is fixed for the 28th inst. Visitors are always welcome at the White Swan, Tudor-street, E.C.

The Pharmaceutical Journal states that Mr. J. P. Gibson, M.P.S., Hexham, who is so well known in the North of England as a lecturer and as an authority upon the Roman Wall, has been again re-elected as a member of the Council of the Society of Antiquaries, Newcastle-on-Tyne, of which his Grace the Duke of Northumberland, K.G., is President.

Royal Photographic Society.—The Annual General Meeting will be held at 66, Russell-square, on Tuesday, February 12, at 8 p.m. The public are requested to note that the exhibition of Mr. F. M. Sutcliffe's photographs will be closed on Saturday, February 16. Until then it will be open daily from 10 to 4, Wednesdays 10 to 8. Admission on presentation of visiting card.

The Late Queen and Science.—In all the biographical notices of our late Queen but scant mention, if any, has been made of her relations to the scientific culture of her reign. It is well known, writes Dr. Andrew Wilson in a daily contemporary, that her Majesty was a most acute observer of the signs of the times, in that she kept herself *au courant* with all that was new and notable in the world of discovery. A lately deceased prelate, with whom I sat discussing science and many other things till the small hours of the morning, told me that her Majesty was remarkably well informed regarding all the scientific movements of the day. We are all apt to forget that it was due to the Prince Consort that, in 1852, the Science and Art Department was projected. In that year the Speech from the Throne indicated the inauguration of the movement for bringing science-teaching into touch with the national life, and for testing by examination the results of that teaching. This was the real beginning of the work of technical education, which of late years has languished in our midst, but which, thanks to county councils and a national awakening to the dangers of foreign competition, is on the fair way to further development. Also, during the latter years of her late Majestys' reign, we saw rewards and distinctions conferred upon scientific men, such as had been conspicuous by their absence in the earlier decades.

The Physical Theories of Photography.—At the last Meeting of the Midland Pharmaceutical Association. Mr. Claudius P. Procter read a paper on this subject. He began by passing a ray of white light through a prism, and showed on a screen the band of colours formed, pointing out the blue and violet rays which, he said, were most photographically active.

He produced a sample of silver chloride which had darkened on exposure to light, and argued that the change was due to a molecular or physical action, and not purely to a chemical action. Though silver chloride and bromide gave off on exposure a portion of their halogen, there was no apparent change in their chemical character, assuming an allotropic condition similar to phosphorus and sulphur deposited from a solution in carbon bisulphide. Again, silver sulphide changed its physical condition on exposure, but not its chemical condition. Mr. Procter went on to show the action of light in decomposing a mixture of chloride and hydrogen. He dealt at some length with the various theories of Abney, Vogel, Drinkwater, and others, and said the arguments in favour of these, whether chemical, electrical, or molecular, were not as yet sufficiently proved. A dissociation of chlorine from silver chloride was certain, as its presence could be proved, but whether the chlorine became reabsorbed and a new or photo salt was formed was not certain. In conclusion, Mr. Procter expressed the opinion that Carey Lea's contention that the amorphous silver chloride became on exposure a crystalline one was worth some attention.

The Influence of Photography on Victorian Art.—It is too early yet to sum up the achievements of the Victorian Age in the field of art, and the task, even were it possible, would be of small profit. But in one respect the march of progress during the time spanned by the Queen's reign has been remarkable. I mean, of course, writes G.R.H. in "The Pall Mall Gazette," the enormous advance in art education and the consequent higher average of technical skill. Sixty years ago, the public in the mass was hopelessly amateur in its attitude towards the Fine Arts. The artist was regarded as a creature apart, mysteriously endowed by the gods with attributes beyond ordinary comprehension. Next to him in honour was the "gifted amateur," who scrawled with a pencil or dabbled in water colours, and whose proudest boast was the confession that he had never studied. The gift-books and "albums" of that date, the equivalent of the illustrated magazines of to-day, exposed the nakedness of the land, and had no higher virtue than a simpering prettiness which must be either sentimental or devout. To what, then, are we indebted for the radical change in taste? Throughout the black times of the forties there were many great masters at work. Constable and Wilkie, it is true, were dead, but Turner was still painting the pictures which either set the seal upon his greatness or marked his decadence, according as you select your authority. In France the deep and vital Romantic revival was sending its long eddies to lap even upon the shores of England, and later there was the modern Pre-Raphaelite movement and the famous Manchester Fine Art Exhibition of 1857. To all these things the public might have remained blind, but just in the "nick of time" came the great improvement in the processes of photography. What many centuries of pictures had failed to do the discovery of Daguerre achieved with the speed of magic. The public became easily familiar with the human form, and in a decade of unconscious assimilation learned to discard the namby-pamby conventions and inanities of their grandparents. On the top of this, inspired by the Crimean War and the Indian Mutiny, there began the advance in newspaper illustrations, and finally came that school of illustrators which is identified with the early sixties. From that moment, in England at least, the public had admitted the limitations of its knowledge—though scarcely the limits of its ignorance—and set itself steadily to learn. The argument and the deduction may both be strained, but to me it seems certain that the Fine Arts during the Victorian age have been enormously indebted to photography. This new discovery of form—more or less actually revealed in the photograph and in the hands of everybody,—was undoubtedly the basis of comparison from which sprang a modern zest for accurate draughtsmanship. Landscapes no less than figure drawing were affected by it, and the Teaching of Turner and Ruskin was capable at least of a certain measure of proof by being directly brought to the test of Nature. I am not maintaining now that the artist need ever be indebted to the camera, but only that the attitude of the public towards his work has been radically changed by the photographer. The recognition of true form was quickly followed by severer criticism of the art of painting, and the youths of the sixties began to seek the education which England could not give them in the studios of Paris and Munich. To-day mere craftsmanship is immeasurably higher than it was thirty or even twenty years ago. It cannot be added, unfortunately, that the production of great works of art has kept pace with the advance in artistic education. At the end of the Victorian Age British art is in a backwater. But there are many hopeful symptoms that when the great flood-time arrives the public will be ready to welcome the change. For one thing, in the Academy one can hear the distant mutterings of conscience, and reform is in the air. Its professor the other day was acclaiming Corot, which must have caused much stir and knocking of Academical bones, and modern "Impressionism" is no longer the Academical synonym for an unclean and an unholy spirit.

Commercial & Legal Intelligence.

Mr. F. H. Taylor, of 1, Errol-street, Whitecross-street, London, E.C., writes, under date February 1, 1901: "I have much pleasure in informing you that I have this day admitted into partnership my two sons, Messrs. Herbert William and Percy Frank Taylor. The firm from this date will be known as F. H. Taylor and Sons."

Messrs. Wallis Bros., of Kettering, send us their catalogue for 19(which contains full particulars of the "Wallis" photographic specia ties, including shutters to suit all kinds of work, daylight loading pla carriers, and the new "Penna" focal-plane hand camera. The catalog is a beautifully printed and illustrated production.

At the Brigg Petty Sessions, on the 30th ult., several charges of obta ing money by means of false pretences with intent to defraud we preferred against Wilmot Henry Turner alias Lance Granville ali Charles Johnson, by representng himself to be an agent for Mr. E. Clark, photographer, of Gainsborough. It was alleged that prison obtained orders at a cheap rate, saying the firm was doing it f advertising purposes, and in consideration of the low prices the mon must be paid in advance, and discount allowed. He had obtained sur of 14s., 9s., 2s. 6d., 4s. 6d., 7s. 6d., and 10s. from various people in t district. Prisoner now pleaded guilty to all charges, and was sent gaol for five months with hard labour.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
11	Bognor	Monthly Competition.
11	Bradford Photo. Society	*Stereoscopic Photography.* James Tayl
11	Glasgow and West of Scotland	Demonstration: *Thornton Film.* Wal D. Welford.
12	Aintree	*Edinburgh and the Western Highlan* D. J. Neill.
12	Birmingham Photo. Society	*Practical Hints on Retouching and Manipulation of the Negative befo Printing* F. Lewis.
12	Manchester Amateur	*Films v. Plates and the New Thornt Film.* Walter D. Welford, F.R.P.S
12	Newcastle-on-Tyne	*Enlarging with Home-made Apparat* Messrs. Thompson and Lee.
13	Borough Polytechnic	*Control in Printing.* H. W. Benne F.R.P.S.
13	Croydon Camera Club	Eleventh Annual Meeting.
14	Ashton-under-Lyne	Demonstration: *Lantern-slide Maki by Reduction.* Walter Chadwick.
14	Darwen	Prize Slides.
14	Hull	*Knightly Effigies, and How to Photogra them.* J. V. Saunders.
14	Liverpool Amateur	*Round the World vid Australasia.* Gregory Jones.
14	London and Provincial	Paper by W. Thomas.
14	Oldham	*Paris and its Exhibition.* A Member.
14	Woolwich Photo. Society	*The Photography of Colour.* E. Sang Shepherd.
15	Aberdeen	*Rambles with Cycle and Kodak.* R. Johnstone.
15	Croydon Microscopical	Lantern Slides: *The Isle of Man.*

ROYAL PHOTOGRAPHIC SOCIETY.

Lantern Meeting, February 5,—Mr. J. J. Vezey, F.R.M.S., in th chair.

Mr. Ernest Marriage gave a lecture on "Romanesque Archite ture," accompanied by a singularly interesting series of lantern sli from photographs taken by himself. It is from the eleventh to t early part of the thirteenth centry that the Romanesque style architecture held its sway, originating in Italy, and quickly spread into neighbouring countries. For the origin of the forms used in t decoration of what in England are usually called Norman, in Ge many Byzantine, and in France Romanesque buildings, one must lo to the Greek Empire of Constantinople. Byzantium was, in the ear centuries of the Christian era, in close touch with western and easte nations, and many of the stones, crosses, &c., to be found in the islands were inspired at least by the Byzantine art, and are not Saxon origin. One of the finest Lombard churches in Italy is that St. Ambrose in Milan, another being that of San Zeno, Verona. Son fine exterior and interior views of these were shown, followed b examples of the German Romanesque style as found at Neuweite Schlettstadt, &c. The Rhenish village churches partake more closel of the Italian style. Speaking of the interesting details which ar more often contained by the porches and doorways than the othe parts of the buildings, Mr. Marriage observed that few English doo ways at all approached in richness of ornamentation those of the Con tinental churches and cathedrals. A photograph of a portion of th west front of Notre Dame, at Poictiers, exhibited to a striking degre the wealth of ornament enjoyed by that building. Illustrations o his remarks were afforded by some excellent photographs of th narthex at St. Mark's Alpirsbach, Iffley, Elkstone, &c. Mr Marriage gave considerable attention to the subjects treated in th carvings of doorways, &c., and the conception of such religious scene as the Nativity, the Creation, and the Judgment by different crafts men, was quaint and interesting. The Creation is very elaborately worked out in mosaics in St. Mark's, Venice. The German Romanesqu

had not the variety, in the lecturer's opinion, of the Italian or French work. The finest Romanesque church in France was probably that of Vezelay, which possessed an abundance of finely executed work, much of which was seen in the slides. Some hundred or more views were shown, and, as the Chairman later remarked, they all bore unmistakable evidence of the deep love and grasp of his subject that Mr. Marriage is more and more renowned for.

Mr. Vezey felt that further evidence, if it were wanted, of the untold value of photography—our art—was afforded by the fine pictures by Mr. Marriage that had been seen. Drawings could never reveal the wealth of detail of these handsome and venerable piles with anything like the perfection of a photograph. On behalf of the meeting, he tendered to the lecturer its hearty thanks.

Mr. S. J. Beckett showed a dozen very good photographic slides of incidents in the Funeral Procession of our late Queen, as seen from Hyde Park Corner. His energy and zeal in so soon showing these results was rewarded by an enthusiastic reception.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 31,—Mr. J. E. Hodd in the chair.

A letter from Mr. A. L. Henderson, at Florence, was read, promising several lantern displays of photographs taken during his winter trip abroad.

Mr. T. E. Freshwater passed round some photographs of the proclamation ceremony at the Temple Bar. The foggy weather was much against photography, but the prints were nevertheless creditable to their producer. He also showed photographs of a wild cat's claw and other interesting objects.

A small pocket camera, for film, was shown by one present. It was constructed of aluminium, and sold for five shillings.

Mr. A. Mackie said that, in times gone by, amongst the various things suggested and recommended for the elimination of the last traces of hypo was a solution of acetate of lead. He wished to know the action that took place in such a process. The hint had been several times published.

Mr. A. Haddon, in commenting upon the subject, said that acetate of lead was very dangerous to use, as it was apt to get into the paper, and there would be much difficulty in getting it out. It seemed that one would be substituting one objectionable substance for another. He could not see what action would follow the use of the acetate of lead in the manner described.

Mr. Mackie said that acetate of lead was part of the toning bath at one time recommended by the Eastman Company. The chloride of gold was mixed with the acetate of lead, and a precipitate of a yellow or brown colour resulted. What action took place there? he asked.

Mr. Haddon expected that there would be a double salt of acetate of gold and chloride of lead in all probability.

Mr. P. Everitt said Dr. E. Vogel had been experimenting in connexion with toning operations. In order to bring the bath into a condition such that, when the gold is exhausted, no further toning took place, acetate of soda was added, and sulphur toning thereby prevented.

Mr. Everitt referred to the tele-photo attachment for a hand camera shown by the Chairman at a recent meeting. He had strong doubts at the time when the pamphlet was shown him regarding the need for such an attachment which gave but 3½ diameters enlargement. Where, he asked, did the element of cheapness come in, if for 36s. one got merely 3½ diameters, when, for a little more, for 50s., one could get a magnification of 10 diameters.

The Chairman said that the lens was not introduced from motives of cheapness, but because, with the ordinary bellows extension of the American type of folding camera, one can get with it a magnification of 3½ diameters, which, with the high-power tele-photo lenses, could not be obtained with the same bellows extension.

Mr. Everitt went into the construction of the lens, and some further discussion ensued between him and the Chairman.

A Member asked, through the question box, for some information regarding self-toning paper, of which it was said that the gold necessary for toning was included in the emulsion. Was it possible to incorporate the gold in the silver emulsion?

Mr. Haddon said that many years ago Ashman and Offord wrote about citrate of silver emulsions, and they found that the best results were obtained by the addition of a small quantity of chloride of gold to the finished emulsion. This proved that the gold had a certain influence, and that it could be incorporated in the emulsion.

Mr. Everitt thought it extravagant, if the assertion were true, that the gold should be spread over the whole surface of the paper when it was actually only wanted in parts.

Mr. J. S. Teape said that he saw an inquiry about a week ago for a formula for sepia tones on P.O.P. The ordinary sulpho cyanide bath would do if the paper had been kept about three months.

Further discussion ensued upon the advances made by colour photography in recent years, the methods of Lippmann, Ives, Shepherd, McDonough, and Joly being referred to therein.

PHOTOGRAPHIC CLUB.

JANUARY 30,—Mr. W. R. Stretton in the chair.

Mr. E. F. Chapman, of the Atmospheric Gas Company, of Leeds, exhibited a new gas-lighting system, called the "Atmospheric Gas," because analysis shows that only 1.86 per cent. by volume of its constituents is combustible hydrocarbon, the remainder being simply ordinary atmospheric air. The atmospheric gas is applicable to lighting, heating, and power purposes, but it was with its lighting properties that the speaker primarily wished to deal. A negative was passed round, together with prints showing what the light had done. A Barnet medium plate was used, three seconds at f-11 being given with three incandescent mantle burners going. Photometric tests have been made which show that a Welsbach C mantle rendered incandescent with this gas produces a candle power of 125, as compared with 45 with ordinary coal gas. Its actinic power is the subject of some careful tests now being made, but it was interesting to know that, to produce with an electric arc lamp the results shown, a candle power of 2000 was required, and the results then were not nearly so soft and pleasing as those with the atmospheric gas lamps. As regards cost, the claim is that atmospheric gas costs less than half that which coal gas costs for a given amount of illumination. The following practical tests were given in support of this claim. Eleven lights (Welsbach C mantles), burning continuously for 6¼ hours, consumed 7.3 pints of mixed oils costing rather under, but say, one shilling. That is to say, 68.75 burner hours, each burner giving 125 candle power, cost one shilling, equivalent to a cost of .0015 penny per candle power hour. Coal gas at 3s. per 1000 cubic feet, each burner consuming five cubic feet per hour, producing a light of 50 candle power, works out as .0036 penny per candle-power hour. The relative cost is thus one to two and one-third as nearly as possible. The gas is produced by forcing air into chambers containing a mixture of paraffin and benzoline in certain proportions. The power necessary to force the air into these chambers is small. Mr. Chapman used a small electro-motor, but the cost of running this carried out to the candle power hour was so small as to be negligible. Other sources of power could be used as occasion demanded; a small crypto gear was shown that could be employed with but slight effort. The gas, of which the composition has been given, is a complete self-burning mixture, requiring no further admixture of air to produce a Bunsen flame. It has been suggested, because of this, that there must be a great danger of lighting back and consequent explosion, but Mr. Chapman assured the meeting that this was not a fact. In the state of dilution, and at the pressure at which the gas was delivered, there was no danger. Further, the rate of flow in the delivery pipe was greater than that of the propagation of flame in a closed tube. To prove that these were not idle words he stopped the motor while the lights were burning, and they went out without a suspicion of danger through back lighting into the generator. The gas is also, as stated, applicable to heating purposes, 2700° Fahr. being given in half an hour, with an oven of one cubic foot capacity. In reply to some questions, it was stated that the life of the mantles used with this gas was prolonged 50 per cent., compared with coal gas. After six months' use he had not found them diminish in brilliancy. Mr. Chapman took off one of the mantles, and showed that it could be handled practically with impunity. The products of combustion, of which, of course, there must be some, were so small in quantity as to be inappreciable, and several authorities were quoted who had been unable to analyse them.

Mr. F. A. Bridge took two photographs with a Dallmeyer 3B lens at f-6, giving 5 and 9 seconds' exposure on a Wratten Speed plate. The last and fuller exposure produced a good negative, three burners being used. It transpired that reflectors had been used in the trials made by Mr. Chapman, and the arrangement of the lights was not the same.

A vote of thanks to Mr. Chapman closed the meeting, after which an informal examination of the lights was proceeded with.

Croydon Camera Club.—The Meeting which was adjourned from 23rd. ult. in consequence of the death of Queen Victoria was held on Wednesday, 30th ult. Mr. A. E. Isaac gave a lantern lecture upon the practice and theory of development. It was characterised by the direct evidence of what it was sought to prove being forthcoming in the shape of a long series of portions of negatives which were exhibited by means of the optical lantern. Without entering deeply into all that transpired, it may be said that the general conclusions arrived at were that the approximately perfect negative depends less upon controlled development than upon correct exposure. A short development with a strong developer was found to be equivalent to a long one with a weaker developer. The effects of varying the ingredients of the developer (pyro-soda) were found to have small result. Contrary, however, to general opinion, the addition of pot. bromide resulted in more contrast, judging only by the appearance on the screen, which may however not be entirely endorsed by the practical printing densities. A so-called soft image-producing developer *i.e.*, rodinal was compared with pyro-soda, the apparent range of opacities being quite as great with the first as the last. The President, in proposing a vote of thanks, stated he could not remember a more en-

lightening series of illustrations and remarks upon the subject of development being given, either at the club or elsewhere, in his presence. He was particularly glad to note that rodinal did not suffer by its comparison with pyro. After some years' practice he concluded that the main difference between a rodinal and a pyro negative is that the former is printed in about a quarter the time of the latter, which in these hurry-scurry times was a consideration. Mr. W. H. Smith did not agree with the dictum of the lecturer that strength of developer had little effect on the range of gradation. For portrait work he found that he obtained a better result by beginning with a weak solution and finishing with a strong one than by using only a strong one. Subsequently Mr. Tylar showed in action and explained the Dreadnought Generator for acetylene as adapted to photographic purposes. The apparatus proved to be portable, simple in action, and gave a most brilliant light. It was tried in the club lantern and threw a series of slides on to the screen which were better illuminated than any light less intense than the limelight would produce. It should prove invaluable for enlarging purposes. There seemed to be not the slightest danger or difficulty in using the lamp and generator.

North Middlesex Photographic Society.—Jan. 28:—Mr. H. Stuart in the chair. Mr. Norgate, a visitor, showed some prints by a process given in the "Photogram" about a year ago. It consisted in brushing over the paper to be sensitised with a solution of sulphate of copper and bichromate of potash. On printing, a yellowish image was obtained, the paper was cleared with a weak solution of alum, and after washing it could be developed to a pleasing brown tone with pyro developer preferably nearly boiling. Mr. Child Bayley passed round a Lippmann photograph of the spectrum, a very perfect specimen. Mr. F. C. Tilney gave some notes, with illustrations, on "The Selection of Subject," upon which an interesting discussion took place together with some friendly badinage which caused some amusement. Mr. Tilney was heartily thanked for coming up at a moment's notice to take the place of Mr. W. Thomas, who was, unfortunately, ill.

Aintree Photographic Society.—At last week's Meeting, Mr. John Harris, the President, gave a practical demonstration on the interesting subject of enlargements, using Barnet rough surface bromide paper, which received an exposure of 40 seconds on a 15×10 sheet, from a quarter-plate negative, the illuminant being incandescent light. Metol was the developing agent used and produced a nice soft print, satisfactory in every way.

Patent News.

THE following applications for Patents were made between January 21 and 26, 1901:—

PLATE-CHARGING.—No. 1314. "An Improved Method for the Exposure and Charging of Sensitised Plates or other Prepared Surfaces in Magazine and other Cameras." F. H. GORDELIER.

ELECTRIC LAMP.—No. 1474. "Improved Electric Lamp for Photographic Purposes." A. L. ADAMS.

FOLDING CAMERA.—No. 1475. "Improved Folding Photographic Camera." A. L. ADAMS.

DISTANCE-RECORDER.—No. 1476. "An Improved Distance-recorder for Photographic or other use." A. L. ADAMS.

STAND.—No. 1634. "An Improved Support for Photographic Cameras." G. HOUGHTON and H. HOLMES.

PLATE-CHARGING.—No. 1690. "Improvements in Photographic Apparatus or Cameras, and to Means for Loading or Charging the same with Sensitised Plates and Films in Daylight." R. C. M. DE BERCEGOL.

"PHOTOGRAPHY."—No. 1818. "Improvements in and relating to Photography." W. J. MCCONNELL.

FORTHCOMING EXHIBITIONS.

1901.

February 16–March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.

" 20–27 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath, S.E.

" 23–March 2 Birmingham Photographic Society. Hon. Secretary, H. Vooght Cornish, Athletic Institute, John Bright street, Birmingham.

March 2–9 ..... South London Photographic Society. Hon. Secretary, Frank Goddard, Vanbrugh Hill, Blackheath, S.E.

" 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

RODINAL.

To the EDITORS.

GENTLEMEN,—I have used rodinal for several years, and am of opinion that it certainly is injurious to the skin. My hands first appeared as if scalded, then cracked and skinned, and my face much inflamed. I consulted a specialist, who treated me for eczema, and told me it was caused by some strong chemical I was using, and advised me to discontinue using it, and keep out in the air as much as possible.

Having followed his advice, the result has been a decided improvement.—I am, yours, &c.,

RICHARD JONES.

265, Oxford-street, Stepney, E., February 4, 1901.

A SOCIETY FOR WOLVERHAMPTON.

To the EDITORS.

GENTLEMEN,—Wolverhampton being practically without a Photographic Society, it is proposed to start one. A preliminary meeting will be held on Monday, Feb. 11, 1901, at 7.30 p.m., in the offices of the Wolverhampton and District Mutual Plate-Glass Insurance Co., Princes-square. All photographers are cordially invited to attend, and justify the motto of our town, "Out of darkness cometh light."—I am, yours, &c.,

B. WILLIAMS.

1, Tettenhall-road, Wolverhampton.

THE ROYAL PHOTOGRAPHIC SOCIETY AND THE LATE QUEEN.

To the EDITORS.

GENTLEMEN,—I am directed by the Council to send you the enclosed copy of a resolution of condolence with His Majesty the King on the death of Her Majesty Queen Victoria, our late Patron, passed at a Special Meeting of Council on Thursday, January 24.—I am, yours, &c.,

JOHN A. HODGES, Hon. Secretary.

Royal Photographic Society, 66, Russell-square, London, W.C.
January 31, 1901.

ROYAL PHOTOGRAPHIC SOCIETY.

To the King's Most Excellent Majesty,—

May it please your Majesty,

At a Special Council Meeting, convened this 24th day of January, 1901, the following resolution was unanimously agreed to:—

The President, Vice-Presidents, and members of the Council, in the name of the Royal Photographic Society, and its affiliated Societies in Great Britain, the Colonies, and the Empire of India, beg most respectfully to offer their heartfelt and sincere sympathy with your Majesty and other members of the Royal Family in the sad loss which has befallen them and the entire British Empire by the death of our beloved Queen and late esteemed Patron.

(Signed) THOMAS R. DALLMEYER, President.
JOHN A. HODGES, Honorary Secretary.

66, Russell-square, W.C., January 24, 1901.

SAMPLE VELOX OUTFITS.

To the EDITORS.

GENTLEMEN,—For some considerable time we have made a habit of issuing free samples of Velox paper with developer free of all charge, upon application being made. Experience has shown us, however, that in many cases the small number of pieces of paper we are able to send are not sufficient for a thorough trial, and not infrequently dissatisfaction and failure result. Now, therefore, that the qualities are so extensively known, we have ceased to distribute free samples. In their stead we are issuing sample Velox Outfits, comprising:—

1 packet Velox (carbon),	A pad of cotton-wool,
1 packet M.Q. Developer,	A Velox Manual,
1 packet Acid Hypo,	Bromide of Potassium,

at the following prices:—¼-plate, 1s.; 5×4, 1s. 1d.; ½-plate, 1s. 6d.

The outfits are neatly and conveniently packed, and, besides their

alue for trial purposes, will be useful to many who require to make nly a few prints quickly, and who wish to avoid the trouble of etting our dishes and special solutions. They contain all the materials ecessary for making finished prints, and are sold by all dealers, or nay be obtained post free from—Yours faithfully,

John J. Griffin and Sons, Ltd.,
F. IBBETSON,
Manager Photo Dept.

20-26, Sardinia-street, Lincoln's Inn-fields, London,
February 4, 1901.

THE PHOTOGRAPHERS' LEAGUE.

To the EDITORS.

GENTLEMEN,—I shall be glad if you will publish the address of the Photographers' League of America. I will see if we cannot get something of the same kind started in this country. It is wanted bad enough. —I am, yours, &c., DEALER.

[The headquarters of the Photographers' League of America are at New York, and a letter so addressed will probably reach that body. It must not be forgotten that some years ago in this country there existed a National Association of Professional Photographers which, to quote Mr. W. S. Gilbert, "did nothing in particular, and did it very well." So well, in fact, that its career was brief and quite useless. EDS. *B.J.P.*]

STEREOSCOPIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I showed my French colleague, Baron Rousseau, your issue of November 30, and before Christmas he asked me to write to you to obtain information in regard to a letter on page 762 regarding stereoscopic photography in which he is much interested. Having been ill and absent from Palermo for the holidays, I have been prevented from writing earlier. What he wishes to know is, what is the process of "coating glass with an emulsion of white lead in collodion" suggested by you? If you will be good enough to give me the details of your suggestion, I shall be much obliged on behalf of my French colleague.—I am, yours, &c., SIDNEY J. A. CHURCHILL.

British Consulate, Palermo, Sicily, January 29, 1901.

[Make a solution of either nitrate or acetate of lead, and add to this a solution of carbonate of soda, by which the lead is precipitated in the form of carbonate. This precipitate is washed, first with water and then with alcohol, and is then added to plain collodion, with which it is well shaken up. One or two trials by coating a plate of glass will determine whether too much or too little has been added. EDS. *B.J.P.*]

REDUCERS AND INTENSIFIERS.

To the EDITORS.

GENTLEMEN,—I should feel much obliged if you could give me a really useful way for reducing or intensifying negatives. I know there are heaps of methods published; which must I select? I have no time to try them all. I am emboldened to ask this, knowing how ready you always are to help the tyro.—I am, yours, &c.,

REDUCER.

[See leading article on the subject. EDS.]

FLASHLIGHT PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In the last issue of your valuable paper you insert a query from your correspondent, Mr. J. H. Baker, relative to an electrically fired flash lamp. I have been experimenting in that line for a few years past, and have long since succeeded in solving this problem, which presented difficulties, at first sight scarcely apparent, as any one, taking the task in hand, would soon find out.

I have incorporated with it my invention of trapping smoke and dust, which, no doubt, you will remember me demonstrating before the London and Provincial and other Photographic Societies many years ago, when I passed oxygen by means of a Clark's oxygen cylinder through a lamp when igniting the powder. Owing to the use of hydrogen, a simultaneous firing of many lamps could not be accomplished to a nicety, but I am now about placing a complete apparatus on the market, which I have every reason to hope will become the flashlight system of the future—at least I have received the most encouraging letters from a wholesale firm and friends, besides using it in my own practice, with results which you have often been good enough to favourably comment upon in the past. I have taken steps to protect my invention, but it would scarcely pay any one to manufacture the apparatus at home, for I have made such arrangements as will enable me to sell the same at a very low figure, properly adjusted instruments being an absolute necessity. Although my magnesium compound causes an exceedingly quick flash, it is in no way dangerous. The exposure is of so brief a duration that even an involuntary movement of the sitter at the time has no effect on the sharpness of the image, as the picture is taken before the movement takes place; besides, there is no report or noise worth speaking about. I beg to enclose a few samples, which, I trust, will meet with your approval. The exposures were made by the figure in the photograph itself, the actual pressing of the button by the thumb not making the slightest difference, as you will observe. Three lamps were used, and any number of different positions may be taken by means of various cameras, which, I think, is not the least of the advantages. Hitherto the operator who ventured to use the flashlight in the drawing-room of an unsuspecting hostess stood in the greatest danger of making himself intensely disliked if the host did not take more drastic measures to hasten his exit, the unfortunate operator being, perhaps, in turn operated upon before the final event.

I think I may fairly claim to have changed all this, and look forward to the blessings bestowed in future upon the brethren of my craft. At any rate I shall be glad to supply your correspondent if he will kindly communicate with me.—I am, yours, &c.,

J. HUBERT.

138, High-road, Chiswick, W., February 4, 1901.

[The specimen photographs Mr. Hubert sends us are very good. Mr. Herbert Tear, of 12, Clapham-road, S.W., also writes that he could let Mr. J. H. Baker into the entire method of igniting flash powder by electricity. EDS. *B.J.P.*]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

G. Milne, 45, High-street, Turriff.—*Photograph of Rev. L. M. Watt.*

L. Varney, Bridge-street, Buckingham.—*Two photographs of proclamation of King Edward VII.*

J. Fairweather, 7, Ellice-place, St. Andrews, N.B.—*Photograph of proclamation of King Edward VII.*

F. Gegg, 18, High-street, Evesham.—*Photograph of the Bengeworth flood. Photograph of proclamation of King Edward VII.*

J. H. Ainley, 426, London-road, Lowfields, Sheffield.—*Photograph of H.M. Queen Victoria, Princess Christian, and Duke of Connaught in carriage at Sheffield.*

EMULSION MAKING.—"SPHINX" writes: "I wish to prepare my own dry plates for snapshot work, also the isochromatic plates? Can you give me a formula, or refer me to some work on the subject?"—In reply: Sir William Abney's "Photography with Emulsions," published by Sampson Low and Co., Fetter-lane, should help our correspondent.

SPOTS ON PRINTS.—"SOUTH WALES" writes: "I enclose you a photo. Will you tell me the reason of its going spotty. New Quay has no water supply. We have to use rain, tank, and well water. I wash them by giving the prints a dozen or more changes separately, pan to pan, after fixing."—In reply: There are many causes that may produce spots similar to these, so that we cannot hazard a definite opinion. We are not, however, inclined to the opinion that the water has anything to do with them. We notice that the front of the mount is printed in bronze, and that may be the probable cause of the spots.

MOONLIGHT STUDIES.—A. F. MACK writes: "Could you tell me if there is a book published on moonlight studies; and, if so, by whom, as I would like to know how they are done, as I see other photographers with them in their cases? I think they look splendid, and would take here. I will feel much obliged if you will let me know how they are done."—In reply: There is no book published on the subject. Most moonlight studies are done in sunlight, when the sun is low and weak, the negatives being more or less under-exposed and kept thin in the development. The prints are then produced in a cold or bluish tone, to give a moonlight effect.

STAINED BROMIDES.—"ENLARGER" writes: "I have toned some bromide enlargements with uranium, but find I cannot remove the yellow stain from the whites, even after two hours' washing. I would be obliged for some method for removing same."—In reply: If the yellowness cannot be removed by two hours' washing, we should say that it was caused through the hypo not being thoroughly removed before the pictures were toned. You might try immersing them in a very dilute solution of sulphocyanide of ammonium. That may possibly remove them.

COPYRIGHT MATTER.—"Moss" writes: "I hold the copyright of a negative of a local minister who has just recently died. I now find that a certain impecunious photographer has unscrupulously copied one of my prints and made and sold something like a couple of hundred 12 × 10 enlargements to members of said minister's congregation and friends. Said photographer has no real place of business, and, although he must have made a lot of money off this deal, yet he is what solicitors call a man of straw. As it is useless suing for damages, have I no redress? Can I get him arrested, or what? I never marked any of my prints that I sold copyright. Does that make any difference?"—In reply: No redress, except by civil means.

SITTER'S OBJECTION.—"D. D." writes: "Two years ago I took a lady for an enlargement order. Two positions were taken, from one of whom the order was executed, the other one rejected. From the rejected negative I made a bromide opal, tinted in oils, just before Christmas, as a specimen. It was exhibited in my windows till last week, but, the party objecting, I put it on table in shop. Now they must have noticed it through the glass door, as they have threatened me with all sorts of things if I do not remove it from shop as well. What am I to do?"—In reply: In the circumstances of the case, the photograph is yours to do what you please with, and you need not notice the threats. But we think a photographer is always well advised in not insisting on the exhibition of photographs against the wishes of his stters.

AN UNSUITABLE WATER SUPPLY.—"W. B." writes: "A few years since I rented a small piece of land, part of a field, on which I erected a photo studio. There are some outhouses, in one of which is a pump, from which I derived my water supply, being from a well. A short time since the landlord let the other part of the field to a cow-keeper, he using one of the outhouses to put his cows in. The consequence of this was that all the drainage from the cows and manure has spoilt the water, making it more like liquid manure, and smells very badly. I am therefore unable to do any photos here now through having my supply of water spoilt, and have given notice that I shall remove my studio. Have I any remedy for the loss and inconvenience caused, and against who?"—In reply: We are rather inclined to doubt if you have any remedy at law, unless you had an agreement with the landlord that the well, as it was when you took the ground, was to be part of your property and that he was to keep it intact. A solicitor might find cause of action, but we rather doubt it. But all will depend upon the agreement under which you took the ground.

BUSINESS QUERY.—"OPAQUE" writes: "Noticing in last week's issue of your JOURNAL a letter from a young man, who has recently started for himself and is doing well, I feel constrained to ask you to kindly lend an ear to one less fortunately placed, in the hope that you may be able to afford me a little paternal advice. I came from London just over four months ago, and bought this business from a man who had only had it for a few months. He was at the time doing a brisk trade in stamp-size portraiture, 24 for 1s., and gave four different positions. A few years ago this place did remarkably well, and kept two male assistants going, besides the proprietor and a lad, and I had hopes of restoring the trade somewhat. I accordingly did not purchase the stamp camera, &c., and, though I had a great number of intending sitters for this size, I refused to take on this work. Consequently, when I settled down to work, I was taking about £1 a week. After a short time this rose to from £2 10s. to £3 a week, and I began to think there might eventually be a fair living to be got if things continued so. They did continue so until Christmas, but since then every bit of trade has gone like a puff of wind, and I am doing now absolutely nothing. My work seemed to be appreciated, as exemplified by numberless re-orders. The trade of the town is essentially a cheap one; population 24,000. There are five other photographers, one of whom has the reputation of having "swept the board" by doing cartes-de-visite 2s. 6d. and cabinets 6s. 6d. a dozen; and I would like to mention the fact that I have learned that two different proprietors of this place have disgraced themselves within the last few years. So you see I have an uphill job to succeed here. I shall greatly value your opinion, if you will be good enough to express it, upon the following points: 1. Do you consider my present lack of business a natural state of things, being just after Christmas? 2. Would you suggest my taking up a 'catch' line, like the former man's stamp portraits, or like some photographers do, viz., unmounted midgets on bromide paper at 1s. per dozen, with extra for mounts if required? Or, 3, Do you advise me to hang on in the hope that the finer weather will see a return of the business?"—In reply: Four months is hardly long enough to justify our correspondent in giving way to despondency. 1. Probably the falling off is due to the season of the year. 2. We are aware that such "catch lines" are successfully adopted by several photographers. 3. Yes, and let our correspondent endeavour to popularise a higher-class work amongst his clientèle. Portrait photography of the better sort, backed up by energetic principles and methods of business, should be made remunerative.

P. B. AVERY.—A threat of legal proceedings will probably ensure the return of the money. This is the only course that we can suggest.

W. SMITH.—The "Directory of Photographers," published by Messrs. Percy Lund & Co., Bradford, is the nearest approach to such a book.

PHOTOGRAPHS OF THE QUEEN'S FUNERAL.—"MONMOUTHSHIRE" writes: "I should like to get a few dozen 12×10 of the snapshots taken at Her Majesty's funeral on Saturday last. Could you kindly give me an address where I can get them?"—In reply: Possibly such photographs as our correspondent requires may be obtained of Messrs. Spooner, Strand; the London Stereoscopic Company, Cheapside, E.C., and similar firms.

A WAGES QUESTION.—"AJAX" writes: I shall be glad if you will tell me, through your column, what I can do in this case, viz., since I left —— I have been with a certain photographer here. He answered my advertisement asking 'full particulars for permanency.' This is the text of his letter, which I have in my possession. He gave me a fortnight's trial. Business now being bad, he turns round and tells me I must look after another berth. Can I sue him in County Court?"—In reply: The term "permanency" is ambiguous to the point of meaninglessness. We doubt if you can recover in the County Court if you agreed to go on trial.

FADING OF PRINTS.—PLUSH BLOCKS.—"AMATEUR" writes: "1. Will you be kind enough to tell me the cause of the enclosed photographs (of enrichments) fading and turning such colours? These, I may say, were taken about ten months ago; some are all right, others like this. 2. Also the name of a firm who supplies plush blocks for mounting photographic views and opals on; London firm, if any?"—1. The cause of the fading is either imperfect fixing or washing, or, what is more probable, the two combined. When we heated one of the prints it gave off a strong smell of sulphur. 2. The mounts are supplied by all such houses as Marion's, Houghton's, &c.

WORKING UP IN BLACK AND WHITE.—INQUIRER writes: "I should be grateful if you would suggest the best way of learning to work up in black and white where personal tuition is not available, and would inform me to what extent respectively brush work, the aerograph, and rubbing in with powdered chalk are used in good-class work."—In reply: In Mr. Robert Johnson's *Art of Retouching Negatives* (published by Messrs. Marion) there are some chapters on the finishing and colouring of photographs which may help you. Brush work is very largely practised, and the aerograph we know to be in great use; of the three, perhaps the first is most practised in "good-class work."

INTERIOR PHOTOGRAPHY.—"W. K." writes: "I have some interiors to photograph—drawing-rooms, halls, &c.—and would feel obliged for a few 'tips.' 1. Should I use 'Iso.' plates, and, if so, with or without a screen? also rapid, medium, or slow? 2. Should I develop, when using pyro soda, with a developer weak in pyro, extra quantity of soda, and well diluted with water? 3. If I stop down, in order to get the distant objects in fair focus, will the result be hard? I shall use a Cooke 7½ inch focus lens on a 5×4 plate. The greatest length of interior will be thirty to forty feet, and I want the results suitable for enlarging."—In reply: 1. Ordinary plates will do, and we should, if the light is bad, use the rapid. They should be backed so as to avoid halation. 2. Use the normal solution somewhat diluted. 3. No, unless the plates are under-exposed. 4. The lens will answer very well.

THE SALE OF SECOND-HAND APPARATUS.—W. ATKINSON writes: "Could you recommend a firm who would be likely to dispose of or else buy from me a quantity of photographic materials? I tried ——, that is, I sent a list, but they only selected the cameras, &c., not background and accessories, printing frames, dishes, &c. I also have upwards of 2000 negatives, all sizes, from quarter-plate to 15×12 (about 200 are 15×12). Do you know if there is any firm who buy these, and about what price do you think they are worth per dozen?"—In reply: Possibly Messrs. Sands & Hunter, Cranbourn-street, or Messrs. Morley & Cooper, Upper-street, Islington, might purchase the goods, although photographic material, second-hand, is best disposed of by auction, say, at Mr. J. C. Stevens's, King-street, Covent Garden. As to the negatives, unless the subjects are in themselves interesting, they are only saleable as glass for horticultural or similar purposes.

THE FOCUS OF LENSES.—"OTHELLO" writes: "My impression always was, and I fancy I have many times seen it in print that, when a lens forms an image the same size as the original, the distance between lens and object is equal to the distance between lens and screen. I have found that in one instance this is not the case, and so astonished was I that I carefully repeated the experiment to ensure accuracy. I was testing a lens for focus by forming an image the same size as original when it occurred to me to verify my result by testing an Optimus R.R., the makers' focus for which is 8⅞. My object was 3 inches on a foot rule measured by another, and I enclose following measurements taken twice running:—Image 3 inches, object 3 inches, Optimus lens. From diaphragm to focussing screen, 13⅜ inches; from object to diaphragm, 27½ inches. The lens I was testing, a Broome R.R. of about 8½ focus stood as follows: From diaphragm to screen, 17½ inches; from object to diaphragm, 17 inches. This method of testing, if based on the facts first mentioned, would be very inaccurate, as the Optimus would work out to be about 10 inches focus, which I know is not right."—In reply: What you have read is quite right, but it applies to the optical centre of the lens. We are of the opinion that you had not got the sizes of the object and the image on the ground glass strictly accurate, or that the measurements were faulty. Repeat the experiment and see the result.

*** Many answers to correspondents, Editorial Table, and other matter, are unavoidably held over.

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EX CATHEDRÂ.

"Guinea-gold" Photography.

Messrs. Ogden, the well-known cigarette manufacturers, have long employed photography to promote their business. The little bromide and collotype prints which are attached to their cigarette boxes are produced for them by the million, and are zealously collected by small people, as every smoker knows to his discomfort and impoverishment. In one household that we know of, the nightly demand for cigarette photographs could only be satisfied by a perfectly appalling outlay of money. The cigarettes, in fact, are frequently bought for the sake of the photographs. By the advertisements in a little heap of newspapers that have been sent to us during the past few days we perceive that Messrs. Ogden's unquenchable enterprise proposes to place photography under still greater obligations for commercial purposes. You are invited to send the firm six of the little prints we are referring to, the photograph to be reproduced, as well as half a crown, and in return, "owing to the wonderful facilities which Ogden's, Limited, possess for the reproduction of real photographs" (*sic*) you will receive "one dozen real permanent photographs, beautifully finished and mounted, and measuring $4\frac{1}{2}$ in. × $6\frac{1}{2}$ in. (including mounts). The photographs," it is added, "will be quite free from advertising matter." This skilful development of the coupon idea in photography is in reality not so novel as it may seem, for quite twenty years ago we remember the same thing being done by tobacconists in a small way of business. Several letters that we have received condemn Messrs. Ogden for interfering with ordinary photographic business. It must be remembered that the same kind of condemnation has been directed against newspapers and other trading concerns that make a feature of selling cheap enlargements. We sympathise with any photographers who may be hurt by the intrusive competition of wholesale tobacconists and others, but the sale of cheap photographs by anybody so minded is entirely legitimate business, and can only be objected to on the very unsubstantial ground of sentiment. In matters of buying and selling, sentiment, we are assured, should find no place; and it rarely does. There is nothing whatever to be said against Messrs. Ogden making the sale of their cigarettes the excuse to supply those persons who smoke them with cheap photographs; in like manner, if a photographer advertises that, with every dozen photographs he takes, he will present the sitter with a packet of Messrs. Ogden's cigarettes, who shall —or can—say him nay? It is a free country.

* * *

Copyright Risks and Dangers.

It should be said, in justice to Messrs. Ogden, that their advertisements are innocent of the falsehoods that only too frequently vitiate the familiar offers of cheap enlargements and the like. The one dozen "real permanent photographs"—a new name for bromides, we suppose—are not stated to be worth some fabulous amount, which some equally mythical photographer is said to be charging. Messrs. Ogden do not pose as philanthropists, and they make a plain straightforward offer which is commended to the newspaper-reading (and cigarette-smoking!) public entirely on its merits. In other respects, too, Messrs. Ogden's offer differs from similar speculations. They recognise the difficulties arising from questions of copyright, and so the applicant for the twelve "real per-

manent" photographs is required to sign one of the following declarations:—

I hereby declare the enclosed photo was
a. Taken by a photographer for me at my sole expense;
b. Taken by a photographer for and at the sole expense of a person whose consent I have to send it to you for copying;
c. Taken by me; or
d. Taken by a person whose consent I have to send it to you for copying.

Messrs. Ogden must be applauded for taking steps to guard themselves against the risks of copyright infringement; but those familiar with the Act and the cases decided under it will probably agree with us that the four declarations above quoted do not by any means close all the avenues of danger in which the proprietors of the Guinea Gold Cigarettes may land themselves. But, of course, Messrs. Ogden, in embarking in the business of professional photographers, are prepared to take the rough with the smooth of it, and, so in leaving them to their new enterprise, we are persuaded that their progress in it will be followed with much interest by photographers generally, and the Photographic Copyright Union in particular. Apart from this matter, it is interesting to note that the cigarette and fancy goods trades have in recent years given an enormous impetus to some branches of commercial collotype and bromide printing. When the cigarette craze in this country started a score or so years ago, it was upon American initiative, and the use of photography for the purpose of advertising the cigarettes also traces its origin to the same source. But in those days photographic copyright was less intelligently understood than it is now, and the infringer flourished unmolested.

* * *

The Revival of Old Processes. We have frequently suggested that experimentalists in photography should take up some of the old, and to many unknown, and others forgotten, processes introduced in the very earliest days, and apply them with modern chemical knowledge. That knowledge is far more extended now than it was at the time these old processes were first described. The other night, at a meeting of the North Middlesex Photographic Society, Mr. Norgate showed some prints by a modification of a very old process, the basis of which is the chromatype of Hunt, published something like half a century ago. The two processes are not, however, identical, for they differ materially in the working; but in both, at the initial stage, they are identical—the light sensitive material is the same—a mixture of sulphate of copper and bichromate of potash. In Hunt's process the print, after exposure, is developed, or rather reinforced, for a visible image results in the printing, with a solution of nitrate of silver or of nitrate of mercury. Mr. Bingham, at the time writing on this process, says that, if sulphate of nickel be substituted for the sulphate of copper, the paper becomes more sensitive, and that the image is more clearly developed by the nitrate of silver. In the process described by Mr. Norgate, the image, after printing, is cleared with alum and then washed. It is then "developed" with hot pyro developer, preferably nearly boiling, when a pleasing brown picture results. Now, it will be seen that, although the two processes are essentially different, the sensitive material "bichromate of copper" is the same. Hence, as we have said before, the old and forgotten process of the earlier days of photography deserve overhauling, with our more enlightened chemical knowledge when some of them may possibly be turned to some practical value.

* * *

A New Transparent Support. M. Plaissetty has taken out a French patent for the preparation of nitro-cellulose collodion, which is rendered inexplosive and non-inflammable by means of a salt of aluminium. The salt of aluminium may be allowed to act directly on the nitro cellulose, but the product is deliquescent. This can be remedied by immersion for a short time in concentrated ammonia; the nitro-cellulose thus treated is still soluble in all the usual solvents, and especially in ethyl acetate, and gives a homogeneous collodion. A salt of aluminium may also be oxhydrated, and added in alcoholic solution to the solvents employed in the preparation of collodion, which prepared according to either process, has the same properties. This treatment of nitro-cellulose allows a reduction in the quantity of solvents in making the collodion, and a part or the whole of the camphor may be suppressed in the preparation of collodion.

* * *

Photography in Colours. MM. Truchelut and Rochereau have patented an originally conceived idea of obtaining photographs in colours, particulars of which we translate from "La Photographie." Instead of the process of selection of the colours by means of screens, they are eliminated at once or rendered inactive all except one which it is desired to photograph. To effect this, the artist paints his original with three colours only—red, yellow, and blue; for the first mercuric iodide is to be used, for the second ferrocyanide of silver, for the blue a lake of aniline blue with sulphate of lead, which are ground up with a suitable vehicle, such as honey, albumen, &c. By immersion of the picture in solution of an alkaline chloride, which transforms the ferrocyanide into white chloride of silver, the yellow will disappear; as the blue acts on the plate like white, the image photographed at this moment will represent exclusively the reds of the subject. The picture is now placed in a solution of iodide of potassium, which dissolves the mercuric iodide and converts the chloride of silver into yellow iodide, which is thus alone photographed. The iodide of silver can now be dissolved by potassium cyanide, and only the blue remains, and this can be photographed by converting the lead into black sulphide by means of an alkaline sulphide.

* * *

A New (?) "Pigment" Process. In our issue for December 28, 1900, we gave the précis of a process for obtaining prints by the action of exposed chromated gelatine upon various aromatic organic compounds, which was recently patented by Dr. Andresen and Gusseron, and assigned to the Actien-Gesellschaft fur Anilin-Fabrikation of Berlin. Our French contemporary, "La Photographie," edited by MM. Niewenglowski and Clerc, points out that in the "Bulletin de la Société Francaise" for 1878, pp. 233-238, there was reprinted a memoir by E. Kopp, which was first

published in 1863, and calls attention to the similarity of the two processes, and says it is well known that a brown image of chromic oxide is formed on exposure to light of a paper or film impregnated with bichromate of potash. Kopp says, "On peut utiliser les propriétés oxydantes de cette substance brune en faisant réagir sur elle un corps qui, en oxydant, donne des composés colorés insolubles: c'est le cas avec certains acides pyrogénés, plusieurs combinaisons l'aniline et de naphtaline, soit même avec certains composés minéraux, par example les sels ferreux," &c. The following passage in the patent above described is curiously similar: 'Nous avons trouvé une nouvelle méthode pour produire les images photographiques à l'aide du dioxyde de chrome. Cette méthode a pour bas le fait, jusqu'alors parfaitement négligé dans la photographie, que le dioxyde de chrome formant l'image latente possède encore des propriétés oxydantes très actives et qu'il peut transformer certains produits aromatiques incolorés en matières colorantes des nuances les plus différentes." From this it would seem that Kopp anticipated this process in principle. According to the specification, the process is as follows: Raw paper is sensitised by immersion for one minute in

Soft gelatine	6 parts,
Ammonium bichromate	16-20 parts,
Warm water	100 parts.

The paper must be dried in the dark, and then exposed under a negative for about half the time required for a gum-bichromate print, and then washed in water acidulated with 0.1 per cent. of sulphuric acid, and it can then be developed in a bath of

Paraphenylendiamine	1 part,
Sodium bisulphite	1-2 parts,
Water	600 parts.

The image will appear of a dark brown, and can then be washed in acidulated, and then in plain, water, and dried. Dimethylparaphenylendiamine, soluoleneparadiamine, 1:5 naphtolendiamine, paramidophenol, methylparamidophenol, orthoparamidophenol, B triamidophenol, pyrogallol, 1:5 dioxynaphthaline, paramidodiphenylamine, paradiamidophenylamine, aniline, and dimethyloniline may also be used, and give different colours.

* * *

Proclamation Photographs. The other evening, at the London and Provincial Photographic Association, Mr. T. E. Freshwater showed a photograph of the ceremony of proclaiming the King at Temple Bar. This photograph will be very interesting in the future. It may be years—we hope many—before a similar scene will be witnessed. How interesting would be a similar photograph of the ceremony of proclaiming the late Queen at the same spot, when the old Temple Bar, with the houses on the north side of it, were standing; but then photography was not. At most places where the proclamation was read cameras were in strong evidence, and the results obtained will be valuable in future generations in more ways than one. Not only will they serve as souvenirs of the occasion, but by comparison with others that may be made at future proclamations—wide apart we trust—they will serve to show the change that has been wrought in the interval in the different localities, as such would have been the case with Temple Bar. They will also serve to illustrate, by comparison, the progress made in photography itself between the different epochs.

* * *

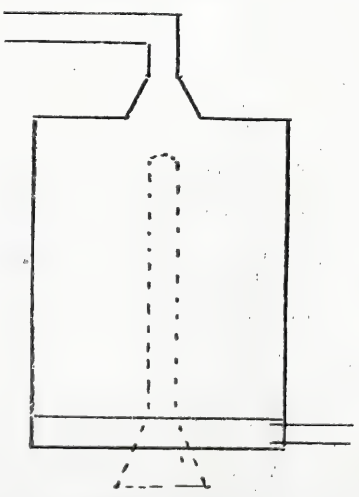
Photographs of Snow Scenes. At last photographers in the home districts have had a fair opportunity of securing pictures of snow scenes to their hearts' content. But many, we learn, are disappointed with the results they have obtained, principally through errors in the exposure and lack of judgment in the development. Some have complained that they have failed to get sufficient density in the skies, and that there is no contrast in the snow, or that the snow and skies were of the same depth, &c. Some years ago, we remember, there was a discussion as to whether, in a photograph, the snow should be represented as whiter than the sky, or the sky lighter than the snow, and there was much diversity of opinion on the subject, particularly from a theoretical point of view. As we write we have hanging before us a copy of a very fine drawing by Rowbottom, entitled "Winter." It depicts a country scene with a windmill and cottage in the distance. In this the snow, where it has drifted, is a brilliant white, while the sky is a cold grey, which gives the picture great brilliancy, and, at the same time, conveys a very good idea of a winter scene.

THE DRYING CUPBOARD AND ITS USES.

We imagine, even at this date, that a drying cupboard, or closet, specially fitted and adapted for the purpose of desiccating films, is rarely to be found in any portion of the work-rooms of our professional brethren; and this is the more remarkable when we consider that, next to ventilation and a good water supply, nothing is more useful. Just think of the luxury (inexpensive, too) of being able to dry, promptly and effectually, a batch of important negatives away from the inevitable risk and dust of the fireside. Primarily, of course, the closet would be used for drying carbon tissue, an occasional batch of opal plates, negatives and lantern slides, and, more rarely, a plate for collotype. For slides a proper cupboard will be found to be a safeguard against dust, and, if only used for this particular purpose, is worth the trouble of making; indeed, as will be understood, a closet which shall be at all times light and dust-proof and dry is a desirable acquisition. Many pages of the Journal have, in former years, been taken up with descriptions of drying cupboards; dozens, we may say, have been figured in these pages, and no doubt many workers have spent a great deal of time, and not a little money, in making such. It was a delusive business, and one to which the old adage of the schemes of men and mice applied very aptly. Now, we should not have ventured on a topic of this nature at this period of photographic history but for the fact that, owing to the almost general introduction of electrical power and lighting, we are able to make with greater facility a cupboard which shall be reliable, and in this connexion we refer, of course, to the warmth (without injurious emanations from combustion) derivable from the incandescent lamp, and the current of air (also to be made relatively pure) produced by a small electrically driven fan. The difficulties of earlier years all centered in these questions

of warmth and draught, the latter being, perhaps, the more important.

We do not propose to set out here any definite specfication for a drying cupboard—every one to his taste in that respect; but there are certain general rules which it will be advisable to follow:—Firstly, as the cupboard will be fixed in the dark room, the latter should be of ample size and well ventilated, that is to say, with a fireplace and flue to ensure a current of air through the apartment; secondly, the cupboard itself must not be designed on too meagre a scale, an interior space of some ten or twelve cubic feet will, however, probably answer most purposes; roughly, the design favoured is that known as England's. This arrangement was first figured in the JOURNAL in 1880, and has been reproduced in some of the ALMANACS of a later date. Here we have a box somewhat square in shape, with a tightly fitting door, and wide inlet and outlet pipes, top and bottom, to provide the draught of air; in addition is a smaller pipe, which passes right through the box, and a little way up the chimney at the top, having a small gas jet fitted in the lower portion to provide a certain degree of warmth to the interior; the gas being ignited inside the pipe, and the outlet being far above the box, obviates any possibility of gas fumes collecting in the drying chamber. Now, if the chimney of such a cupboard be connected to an ordinary flue, such as might be in any dark room, the arrangement is not only rational, but effective; but, if this extension of chimney cannot be carried out, the chances are that the flow of air through the chamber will be, to say the least, intermittent and unreliable; but we can provide for a good draught of air if we fit up in the inlet pipe, made wide and funnel-shape for the purpose, a small electrical fan (to be bought for little over ten shillings). Another alteration which has been made is in the width and arrangement of the central pipe, which has also, in some cupboards, been funnel shape; an incandescent lamp is fitted here, and, properly screened, gives a good working light, and effectually warms the metal tube which passes into the chamber. It must be understood that no more than a slight degree of warmth is required to dry a gelatine film, and that even this, unaccompanied by a steady current of air, would be worse than useless. Below we figure the relative size and arrangement of central pipe and fixture.



In addition to the special provision of a current of air, it is desirable to make the outlet of same of larger diameter than the inlet, also to filter the ingoing air through a fold of muslin. A small fan mounted upon the shaft of a "Knapp" motor will provide all the current of air required. Such a motor can be driven by a battery of two cells, or, better still, from the main supply, provided a suitable resistance is inserted. Incidentally, it may be mentioned that stronger motors for ventilating purposes are to be had, at extremely reasonable prices, specially wound for continuous or alternating current, and ready fitted with plug for insertion in the ordinary lamp socket; such an instrument would be a boon and a blessing in many a dark room. This larger motor would, of course, also serve to drive the smaller. Sensitised carbon tissue is in best condition when dried in a current of pure air, and in a period of time not much over six hours; gelatino-bromide plates and films freshly coated should be dry in about eight hours to be quite reliable. Now, no one is likely to make his own dry plates, except, perhaps, experimentally; but we have for years contended that this rule need not apply to opal plates. Our experience is that, whereas many difficulties are likely to crop up in the coating and drying of sensitive films for negative work, the same does not apply in the case of the sensitive film spread on opal for positive printing. It is not at all a difficult matter to make a gelatino-bromide emulsion which, spread on opal, shall give a very satisfactory positive, the colour of which will depend largely on the exposure given and the developer used, and, as we are not likely to err on the side of over-sensitiveness, the plates will be easier to work. Any slight inequalities of surface will not show in the case of the positive, nor will defects from possible uneven drying (if such there be) prove any detriment to the picture; as a rule, the opal would be vignetted or masked. Experiments in the direction of emulsion coating on paper or other fabric can only be safely carried through when we have a proper cupboard in which to dry the same. For lantern slides, we repeat, the cupboard saves a lot of trouble and annoyance, the freedom from dust being a great boon. Finally, we may remind any ambitious workers in any or all of these branches of photography that a pure atmosphere in the dark room is a sine quâ non. It is of little use having an electrically driven fan unless it is sending the pure air in the right direction.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

VI.—THE PROBLEM OF DIRECT PHOTOCHROMY IN 1879, AND INTERFERENCE PHOTOCHROMY FROM 1891 TO 1893.

IN 1879, Dr. J. M. Eder published his very comprehensive researches on the chemical action of coloured light, and on photography in natural colours.[1] This memoir does not deal explicitly with interference photochromy, and cannot be said to have directly contributed to the progress of that method; but it is of importance for a connected view of the development of interference photochromy because in it are collected notices of the various attempts made from the earliest times to solve the problem of a direct process, attempts which gave rise to the Zenker-Rayleigh explanation—and also it gives us an opportunity of seeing an authoritative view of this problem in 1879.

[1] "Uber die chemischen Wirkungen des farbigen Lichtes, und die Photographie in natürlichen Farben." Separat-Abdruck (überreicht vom Verfasser) aus dem Programm der K. K. Ober-Realschule in Troppau. Wien, 1879 (Vorwort dated Troppau, June 1879), 68 pages. Cf. Beiblätter zu d. Ann. d. Phys. u. Chem., iv. 470–473.

er first sketched the results which had been obtained in the d from 1777 (Scheele) to 1879, taking explicit notice of the ical action of coloured light. Seebeck (1810) was the first to lish the fact that the spectrum can be reproduced in natural rs,[2] and then comes the work of Sir John Herschel (1839), ond Becquerel (1848 onwards), Nièpce de St. Victor, Testud de regard, Diamond, Simpson, Poitevin, Saint Florent (1874), Hunt, edeschi, and Borlinetto (1856), and others.

nker's monograph is only mentioned [3] in connexion with the ment that the directly obtained images leave much to be desired a fixing process has not yet been found, in spite of the works, ding over a lengthy period, of Nièpce, Poitevin, Zenker, and rens (? Florent). "No practicable results of this method can be nmended and also this can hardly happen in the future." [4]

e may pass over the rest of Eder's treatise. The extremely able criticised collection of the work of others on the subject of hemical action of coloured light, and of Eder's own experiments, no connexion that can at present be seen with the physical tions which are the gist of interference photochromy. The part of er's book which is occupied with these questions is not tioned.[5] But on the other hand, we distinguish the formed con- on that nothing is to be hoped for from the direct method which nated with Seebeck. In this conviction we think we may trace rigin of both an increased interest in indirect methods[6] and also he neglect which was the fate of the ideas of Zenker and Lord leigh, and which lasted, in the case of Zenker, for twenty-three s, until H. W. Vogel (1891) drew attention to them in connexion h Lippmann's method.

We now turn to Lippmann to complete our survey of his work,[7] to mention the remarks of Edmond Becquerel on his experi- ts, which show that Becquerel himself regarded the method of pmann as different in principle from his own. After this it ld be difficult to maintain that Becquerel was in any way the inator of the interference theory.

ippmann's first communication of his interference process was to Paris Academy in 1891,[8] and Edmond Becquerel[9] at once called ntion to the difference between "le procédé entièrement physique" Lippmann and his own, which dated from 1848. He repeated a sage given in his treatise, *La Lumière*,[10] which stated that when coloured images are submitted to the reducing action of one of solvents of silver chloride (such as ammonia or hyposulphite of a), the coloured tints disappear, and there remains on the surface ght trace formed by a thin layer of silver, which, when still wet, ws feeble tints complementary to the former ones. "These cts, for which it is difficult to account *à priori*, show that per- s the thicknesses of the layers deposited play a part in the pro- tion of the phenomena of colouration."

We first meet the names of Zenker and Lord Rayleigh in con- ion with Lippmann's method in a memoir of this year (1891) by W. Vogel.[11] After an historical sketch of photochromy, Vogel ted that Zenker's explanation had found a confirmation in ener's investigations, and that Lord Rayleigh's was only a etition of Zenker's.

The investigations of Charles B. Thwing,[12] Lippmann (second communication),[13] Valenta,[14] and Lippmann (third communication) [15] relate to improvements or variations in the process, and do not deal with the principle. We shall therefore content ourselves with merely referring to them. Perhaps the experiment of Labatut,[16] which showed that the time of exposure is shortened by staining the film, may be classed among these.[17]

In closer connexion with the principles of interference photochromy stand the explanations of certain peculiarities observed in Lippmann photochromes. G. Meslin[18] gave theoretical and experimental explanation of the following three, observed in photochromes of the spectrum:—(1) The colours only suffer a small displacement when the angle of incidence varies; with Newton's rings, on the other hand, when the angle of incidence increases from 70° to 80° the blue passes over to red and even beyond; (2) The colours of the pure spectrum are not shown (the photochromes show a blue or blue-green beyond the red); (3) Investigating the spectrum by reflexion on the glass, instead of on the collodion side, colours are found which are not quite similar to the others (on the collodion side), but which throughout are not their complementary colours.

Also, Zenker[19] explained the result that a spectrum-photochrome shows colours of shorter wave-length when looked at obliquely than when looked at perpendicularly.

We may pass over these contributions to the theory of the interference photochrome with only very slight remark, since we shall soon see that the whole theory was worked out mathematically by Lippmann, and thus the whole range of phenomena became impressed more clearly on people's minds, and also the inherent *unity* became—at least in part—manifest. To this, then, we shall devote particular attention, and finally, I will endeavour to connect it more nearly with Lord Rayleigh's work. By this means I hope to be able to put the whole theory in a succinct mathematical form which can be easily discussed and which will (I hope) lead immediately to some generalisations which, in their turn, will bear on the practice of direct photochromy.

Besides this, I shall try to make the references to the literature of both the theory and practice of interference photochromy absolutely complete. It is now quite necessary that this should be done for *all* branches of photography, the preparation of a complete and well-arranged bibliography is the first step towards the end of a really comprehensive history, which should unite the various streamlets of thought to form a powerful and useful river of future discovery. I need not say how grateful I shall be for notices of works which I may have overlooked.

PHILIP E. B. JOURDAIN.

Cambridge, February 9, 1901.

THE QUESTION OF JUDGING.

[A Paper read before the Dundee and East of Scotland Photographic Association, February 7, 1901.]

To my mind this is a subject worth some consideration and discussion. It is not, perhaps, a strictly practical subject, but we cannot always be at practical subjects, and the true lover of the art is an omnivorous feeder upon anything and everything of the nature of photographic pabulum.

Op. cit. pp. 11–12.
Op. cit., p. 37.
Op. cit., p. 37.
Eder's only references to Zenker are on pages 37 and 58, and are merely for experimental researches of Zenker and others.
See Eder, *op. cit.*, pp. 34–37.
It is interesting to remark that Lippmann had in 1889 paid some attention the rendering of colours in monochrome in their proper values. In a per, "Sur l'obtention de photographies en valeurs justes par l'emploi de res colorés" (*Compt. Rend.*, cviii., April 29, 1889, 871–872; *Beibl.*, xiii. 8–818), he recommended the exposure of the same plate through (1) a blue, a green, and (3) a red glass screen with proper exposures for the purpose of aining correct values.
Compt. Rend., cxii., 1891, 274–275; *Beibl.* xv. 282. Some references eviously given in THE BRITISH JOURNAL OF PHOTOGRAPHY are repeated, t only because other references (chiefly to the *Beiblätter* and the *Jahrbuch r Mathematik*) are added.
Compt. Rend., cxii, 1891, 275–277; *Beibl.*, xv. 282.
T. ii. p. 232.
"Ueber Lippmann's Photographien des Spectrums in natürlichen Farben." rhandl. d. Physik. Ges. Berlin, x. (1891), 33–35; further also *Phot. Mitt.*, viii. 7; *Beibl.*, xv. 560–561.

[2] *Silliman's Amer. Jour. Sci.*, xlii. (1891), 488-390; *Berbl.*, xvi. 368.
[3] *Compt. Rend.*, cxiv.(1892), 961–962, and *Nature*, xlvi. (May, 1892), 12–13; *Beibl.*, xvi. 611.
[4] *Phot. Corr.* Nr. V., 384, and *Phot. Mitt.*, xxix. (1892), 226–228; *Beibl.*, xvii. 1068–1069.
[5] *Compt. Rend.* cxv. (1892), 575; *Beibl.*, xvii. 933.
[6] "L'absorption et la photographie des couleurs."—*Compt. Rend.*, cxiii. (1891), 126–129; *Beibl.*, xvi. 364–365.
[7] We also merely refer to: H. Krone; "Weiteres über Farbenphotogramme von Spectren."—*Phot. Mitt.*, xxx. (1893), 133–135 and 148–150; *Beibl.*, xviii. 192. A short historical account of photochromy and references to papers on Lippmann's theory was given by G. H. Niewenglowsky ("Die neuesten Fortschritte der Chromophotographie und der Theorie der Lippmann'schen Versuche) in Eder's *Jahrbuch* for 1894, Bd. viii. p. 73. (*Beibl.*, xviii. 781.)
[8] "Sur la photogr phie des couleurs."—*Physik. Revue*, ii. (1892), 681–701, and *Ann. chim. phys.* (6), xxvii. (1892), 369 (*q.v.*); *Beibl.*, xviii. 342. A (*q.v.*) inserted after a reference to a paper signifies that that paper must be referred to for details which cannot be given here.
[9] "Ueber die Entstehung der Farben im Lippmann'schen Spectrum." Eder's *Jahrb. d. Phot.*, vii. (1893), 114–121; *Beibl.*, xviii. 568.

To those whose photographic experience carries them over a few exhibitions, visiting them, hearing about them, or reading accounts of them in the photographic papers, there must stand out very vividly, whatever else may have been forgotten, the recollection of the little "storm in the teacup," which followed upon the awards of the judges.

I have been to a good many photographic exhibitions in my day, and at this moment do not recollect of a single one where the awards did not give rise to surprise, if not to something more and worse, and I declare that, as a rule, I have been buttonholed within a few minutes of my entrance and carried off by some excited and astonished photographic friend to view what to his mind was a hideous monstrosity but figuring as (perhaps) a first prize picture.

"Can you discover a single good point in that *thing?*" he asks excitedly, leading you up to the picture. If you do not immediately answer, he is at you again with the remark that, if *you* call that a photograph, he has another name for it.

If you remain long enough in the Exhibition, I warrant that every award in the place shall receive the same treatment from one or other of your acquaintances. They are not maliciously disposed persons either.

Brown, who almost sickened with the sight of the first prize, will put his arm good-naturedly in yours and wax pathetic over the shame of the hanging committee in consigning to an obscure corner a "lovely little gen," which he drags you off to see. Jones and Robinson, those useful hypothetical individuals, will play the same game with you over the second and third prizes, and ten to one there will be more than one who will tell you that, if they had known that it was "this sort of thing" that was the fashion, they could have produced cartloads of it.

This is no over-drawn picture, and let me add that the hypothetical Brown, Jones, and Robinson do not stand for the uneducated laymen, but for men whose own work might be described as verging on the notables. This trouble has been brewing for long, and every year gets more and more acute, childish, and absurd.

In our day chagrined and disappointed ones do not content themselves with a grumble, but, priding themselves on an originality, alas! too often without merit, set up little shows of their own, rigorously excluding all uncongenial spirits who fail to recognise and appreciate their supposed divine afflatus.

Is this everlasting friction a good or a bad thing? Is it inevitable? How is it to be done away with? The whole trouble in my opinion comes from the absurdity of attempting the impossible. Matters of fact may be disputed, but not matters of taste. Art like necessity knows no laws. The only terror to the evil-doer within its gates is the terror of public disapprobation, and the praise and protection of the same public should be its only reward.

I consider the fuchsia a prettier flower than the rose. Can I be made to believe that it is not, even should the whole Royal Academy declare that it is less beautiful?

Can I give any intelligible reason for preferring the fuchsia to the rose? I certainly may say that to me it seems more graceful, its form shows some variety and its colour richer. Yet, you see, to another the virtues I seem to perceive may be vices in his eyes. It is, indeed, just the old story of beauty not residing in the object, but in the eye that sees it.

In early days there may have been some reason for submitting to the judgment of a judge. When men were fighting with great technical difficulties, steeped to the eyes in excusable ignorance, the judge had chiefly to determine how far the result was successful as a *photograph*, and not so much as a picture. The detail and roundness given by the collodion, the richness of the tone in the print, and especially the absence of visible faults in manipulation, were to a great extent measurable quantities, and were fairly well measured by the experts of the day. But these early days are not comparable with those latter, the conditions are entirely different. Practically there are no technical difficulties in our days. Lenses working satisfactorily at high aperture, plates, dozen after dozen of exquisite quality, and without a flaw (full directions enclosed), paper warranted to tone to a full purple with the minimum of gold, high art mounts, &c., where is the difficulty? To my mind we seem to start all pretty much upon a level so far as technical difficulty is concerned.

The judge of our day has no such ponderable material to weigh he must look beyond all that and measure what there is of the "stuf that dreams are made on," in the man's work. Is it not asking to much? Can it ever be anything more than a case of preferring fuchsia or a rose, amongst a collection of photographs eve reasonably fine?

I have several times acted as judge, I have never been satisfied tha there was in my awards much more than a purely personal pre dilection or partiality. Consider for a moment the innumerabl influences determining the direction of judgment apart altogethe from the art question. The personality of a judge has much to d with his judgments. He may be grave or gay and lean unconsciously to either side in his awards. He may be all for the fashion of th day, or condemn everything in the least like it. He may be great on the canons of art, or strong on originality, and given to favour fads, to use a vulgar term.

He may have antiquarian notions and plump for a picture printed in old sepia and framed in a severe black wood frame. Association of ideas may bring beauties into a picture which no one but himself sees, or, lastly, he may be much given to precedent and medals, or gives his note to a work which bears a striking resemblance to a medalled picture in a previous and perhaps more important exhibition. Do not imagine I wish to carry this idea too far, but we know very wel how complex are the influences which determine our conduct on every matter, great and small.

But it may be objected that the individual who would allow those extraneous considerations to influence him should never be chosen as a judge. With this I heartily agree, and, seeing that the individual in this happy condition is yet to be born, what say you to appointing no more judges till he arrives?

But, apart from the personal element, there is a most important difficulty, which I think is common to all alike, that is, the danger of trusting to first impressions.

How often has it turned out that a picture which caught the eye and attention in a most striking way at the first look palled upon you within an incredibly short time. Now, remember that you judges have but one look. There are pictures that have grown upon you in a perfectly irresistible way. If ever the judgment is to be trusted, it is here, for your affection is the outcome of consideration and not a case of love at first sight. If I were ever to value another's opinion upon any of my pictures, it could only be after that other had lived a reasonable time within daily sight of it. I have a valued and candid friend who gives me his good company for some days every summer. Withdrawing a long clay pipe stem from his lips one day, and pointing with it at a picture of my taking hanging on the wall, he remarked with great deliberation, "I like that picture less and less every day." This was bad enough, but worse was to follow, for he immediately added, "It seems little else than devilish to my view." I would not have told you this story but to explain that that same gentleman was loud in the praises of that same picture the very moment his eyes lighted upon it for the first time and I have noted again and again that those persons and things that eventually worm themselves furthest into your affections are quite frequently thought nothing of, to begin with.

This, if true, goes to show, I think, that first impressions are quite often reversed on further acquaintance, and, as bearing on the subject on hand, that the hurried run over the pictures of a large exhibition by the judges could not, all other considerations being waived, lead to anything like trustworthy conclusions.

But, if things are bad when one individual attempts the office of judge, it is ten times worse when three or, perhaps, four are conjoined in the absurd work. If A thinks *this* the best picture in the room, and B thinks *that* is the best (and it will be a poor exhibition which does not give you the choice of at least two bests), it is evident that one of them must give way, or they must choose another picture, which none of them in their hearts believe to be best. If one of the judges give way, then you are back where you were again to one man's judgment, or, rather, you are not quite so well off, since there is the doubt of B to subtract from the certainty of A. Better that B had not been there at all. The difficulty in coming to

my conclusion increases as the square of the number of judges. This rule I have deduced from experience.

Of course, there is the chance that two or three men *may* happen to meet who have pretty much the same ideas on art matters. Their judgment would be worth something, though by no means final. Please to understand that all this refers to pictures up to exhibition merit, and not the rough attempts of a beginner; that is altogether another thing. There is one more difficulty I would like to bring before you in multiple judging, and it is this, you know how diffident some people are in *expressing* their convictions, although they may hold them with pertinacity; and, again, you know how overbearing and masterful others are under the same conditions.

It is idle to suppose that, in choosing a certain number of judges, each individual temperament can be studied, and yet how can they act harmoniously together unless equally inclined to give and take? We all know people who are so opinionative that they will listen to no reason whatever; indeed, will not stay to listen to your reasons, but dismiss your contentions very curtly. Put such a one to judge a picture along with a retiring individual, and you may foretell the result. This is a real and not an imaginary difficulty.

But, altogether away from the impossibility of classing photographs on their artistic merits, who desires his work to be sat upon and judged? who is any the better of it?

If a man recognises better work than his own hanging alongside, good and well. He does not need to have it pointed out; if he does not, then no amount of telling will convince him that it is better, and this is as it should be. Let every man walk according to his light, and hold to it, though it be the light of a farthing candle.

I presume that judging takes place, medals and certificates given, under the impression that the possibility of gaining them induces many to take part in the competition. But surely this is an erroneous view. The vast majority know very well that they can do no more than take a decent place, and they are content. A few, no doubt, are in the running for places, and they have a good idea that their work will be there, or thereabout; but would those exhibitors cease to exhibit even supposing there was no judging and no awards? I think not. Speaking for myself, I should much more readily exhibit at an exhibition where there were neither judging nor awards than where there were both.

It is much to escape invidious comparisons, and even this would give a stimulus to many, and tempt them to bring forward their conceptions to the light of day.

I have attempted to show that medalling of a picture is a hall-mark of no real value, and is only, after all, the personal idea of one or two fallible men. It would not be difficult to go a step further and contend that the making of any kind of award is injurious all round. It gives the individuals securing the distinctions an erroneous idea as to their position in the world of art (I am now referring to the important awards), and, to those who know no better, it sets up an ideal of photographic art which in turn floods the world with barefaced imitations.

There can be no standard by which to measure fine art any more than there can be a standard by which to measure beauty, ugliness, or any other personal conception.

Proposing, then, to abolish judging and awards, I suggest nothing in their places, not even acceptance and hanging as marks of approbation. Let every picture be accepted and hung so long as there is room, and let the result be upon a man's own head.

In this way personality will be encouraged, and at the same time extravagances discouraged (by their mere proximity to saner work). It is no small evil but a great one to show an artist (of any kind) what his work should be like, for the more successfully he follows your indications the greater an imitator he is. Nothing in our art-science can be more highly educative, or more delightful, than a periodical gathering together of our best work, and nothing more disgusting than the attempt to cram down our throats that this, that, or the next one, is the best picture in the collection. Do not imagine that I am arguing that there is not good work and bad work, but I have my notions of what constitutes good work and you have yours, and the judge who comes between us has nothing more than his own notions, the same as we have. On the same principle, I never took kindly to having the faults of any of my pictures pointed out; I never could see the faults even when they were pointed out.

As I tried to show upon what slender and immaterial foundations we built our likes, so I would point out that our dislikes are just as unaccountable.

I have a picture which I think much of. The sky in this picture is specially fine. My candid friend cannot look at this sky, so forcibly does one of the clouds suggest to him "Lottie Collins" in her skirt dance. Were he a judge, he would condemn this picture if for nothing else, he says. Now, even when pointed out, I can see no trace of Lottie Collins, nor can any one of about a half dozen others I have asked to look.

It is not possible to dissociate the merit of a picture from the subject of it, and, of two pictures equally good from a pictorial point of view, you could not avoid preferring that picture the subject of which filled the mind with the pleasantest suggestions.

Many people cannot endure snow scenes, although it is generally admitted that snow scenes are amongst those most successfully reproduced by photography, and specially lend themselves to artistic treatment. A snow picture in the minds of some is associated with cold and discomfort, and they do not allow that any picture is a success that adds to one's misery in place of their happiness.

I myself could never be brought to admire the ordinary classical composition, which as a rule includes a gloomy, shining pool in a dark wood and a half-nude figure sitting solitary on the bank of it.

Another very disturbing element to a judge must be the very varying sizes of the pictures. The theorist, of course, says size has nothing to do with art. This idea is, to my mind, incorrect.

Faults are, I think, much more easily detected in a whole-plate picture than in a quarter-plate. Again, the element of chance is much more in favour of the quarter-plate, in so far as dozens of quarter-plates may be fired off for one whole-plate. An excellent quarter-plate picture is as likely as not a fluke; but, as photographers don't throw away whole-plates for a mere chance success, you have a better guarantee that a fine whole-plate picture is a genuine artistic conception on the part of the author.

Apart from these considerations, however, who could seriously argue that, of two pictures of equal merit, a large work is not more esteemed than a small? Now, if mere size adds to the importance, and therefore the merit of a picture, by what subtile measurement is a judge supposed to arbitrate between a large work and a small, with at the same time different degrees of pictorial worth?

One more suggestion and I have done. We all recognise that the matting and framing of a picture may make or mar it, yet all exhibits are framed, and it becomes a very difficult thing indeed to say exactly how much there is in the picture apart from its tasteful setting. I have seen pictures that owed half of their attractiveness to the framer, and I have seen splendid specimens of photography utterly ruined and made commonplace by that same gentleman, yet the judge cannot order him out of court before trying the cause.

Lest you imagine I am carrying this idea too far, I shall leave undiscussed the confusing effect of mixing up all kinds of processes on our exhibition walls; but, as a simple example, let me ask what effect would be produced upon your judgment of a delicate warm sepia carbon if on the one side it was in juxta-position with a powerful black-and-white platinum, and on the other with a brilliant warm purple gelatino-chloride with enamel surface.

Let us have exhibitions by all means, but cease to classify or make awards. If no comparisons are to be made, why locate machinery pictures together—landscapes or portraits? Introduce variety by a judicious admixture of the various kinds, and lessen monotony.

To my mind, however, the processes which are not antagonistic to each other should be classed together, and not dispersed at random. My only classification would be as follows:—

Class I.—Warm-toned matt-surface, carbon, plain paper, &c.

Class II. — Cold-toned matt-surface, carbon, platinum (black), velox, gelatino-bromide, &c.

Class III. — Glacé-surface, purples, P.O.P., albumen, collodio-chloride, &c.

These classes kept strictly separate; but in each class a judicious mixture of landscape, portrait, and what-not would be at once pleasant to see, restful to the eye, entertaining, and highly educative.

J. K. TULLOCH, M.B.

THE WARNERKE FUND.

A CORRESPONDENT writes to ask us how the Warnerke Fund is progressing. We are sorry to have to reply that, so far, the responses to the appeals that have been made publicly cannot be considered satisfactory. The principal photographic societies in the United Kingdom have been circularised in the matter, but we have no information as to what measure of success has rewarded this course. The appeal, which we printed in these columns some two months ago, brought us the following sums:—

Messrs. Fuerst Bros.	£1	1	0
Mr. Fredk. York	1	0	0
	£2	1	0

This amount we have forwarded to the Hon. Secretary, Mr. F. Ince.

We are glad to note that the members of the Committee having charge of the matter have made generous contributions to the Fund, and we have pleasure in publishing the following list, as, perhaps, a sight of it may induce others to follow so excellent a lead:—

Sir W. de W. Abney	5	0	0
Sir H. Trueman Wood	2	2	0
Mr. J. Cadett	5	0	0
Mr. T. R. Dallmeyer	5	0	0
Collected by Mr. H. Teed	6	6	0
Mr. G. Davison	5	0	0

During the last eighteen months the demands made upon public and private generosity have been unprecedentedly great, and we have no difficulty in realising that our readers, amongst others, have fully borne their share in assisting those whom war and other calamities have placed in need of help. But we have a lively hope that there may still be many of them who can spare a contribution, however small, for the fund now being raised on behalf of the widow and daughter of the late Mr. Leon Warnerke. The times are fatal to long memories. Washington Irving, in his delightful romance of Rip Van Winkle, recalled his hero to life after a lapse of years. Which of us that has read the book or seen the play can forget the pathetic remark, "How soon we are forgot!" when he realises that a few years sufficed to wipe out all recollection of him. We wish to apply the moral in the case of the fund in behalf of which we are now pleading. In his day Mr. Warnerke rendered gratuitous service to photographic progress: in sensitometry; in flexible supports for the sensitive emulsion, in lens standards, and in other respects the influence of his labours is still felt. May we, then, on behalf of those he has left behind helpless and friendless, appeal once more to the many whom Mr. Warnerke directly and indirectly benefited by his work to render a little much-needed aid to this Fund. We shall be happy, as hitherto, to receive and forward contributions—however small—to the Hon. Treasurer. Cheques should be made payable to The Editor, THE BRITISH JOURNAL OF PHOTOGRAPHY, and crossed "Account of the Warnerke Fund."

SULPHITE IN THE DEVELOPER.

[Translated from "Liesegang's Almanach."]

A SHORT time ago the question was discussed, whether the use of sulphite of soda, in the developer for dry plates had a solvent action upon the silver salt of the emulsion.

Theoretically, this question is of great importance. Sulphite may act similarly to an addition of hyposulphite of soda, and, side by side with chemical development, physical development, due to nascent silver, may also take place, though perhaps only in a slight degree. Perhaps this may explain a certain kind of metallic red fog which occurs in development.

It has come under my notice that a solvent action by the developer upon the silver bromide may take place in the case of very prolonged development. This I observed in the process used daily for the past three years by Dr. Eckhardt for the development of Röntgen exposures. In the earlier experiments we made together, an exceptional loss of density was constantly observable in the fixing bath. We repeatedly remarked to each other that we had stopped the development too soon. Finally, the plates were left for ten hours or more in the developer, and in this way we obtained very much better results. When these plates were taken out of the developer they appeared to be fixed, and did not show any milkiness due to the presence of silver bromide upon the unexposed portions. Nevertheless, a fixing bath was used, as, by merely washing, the bromide of silver dissolved by the sulphite might have been precipitated. Subsequent exposure of the plate to light might have caused red fog. These negatives exhibited the whitish precipitate of silver so characteristic of physically intensified plates. I believe the better quality of these negatives, as compared with those developed in the ordinary way, was principally due to the intensification by nascent silver, which slowly took place in the developer.

The solvent action of sulphite is much greater upon chloride than upon bromide of silver. Under certain circumstances this may be the cause of trouble in ordinary practice.

It was my duty to test some samples of chloro-bromide of silver lantern plates. The emulsions had not been allowed to ripen much, and the plates were consequently rather slow. To obtain a blue-black tone, it was necessary to use the metol-hydroquinone developer with a little bromide. The weather was very hot. Development proceeded with much greater rapidity than I had experienced on previous occasions. After using the developer for some time it became cloudy, and the bottom of the glass dish was covered with silver. It was quite impossible there could have been any free silver nitrate present in the film, as a little halogen had been added to the emulsion after washing.

The high temperature was the cause of the increased solubility of the silver salt. The same plates developed much more slowly in cooler weather, and there were no signs of diffusion of the silver salt in the developer.

This function of the sulphite makes itself more apparent than usual in the development of some papers, such as Velox and Tula in hot weather. At 30° C. the development is complete in about ten seconds, whilst in cooler weather from a half to one minute is necessary. Moreover, very fine, bright particles of silver are frequently deposited upon the surface of the print, but they may easily be removed by friction whilst the print is still wet. To work with greater comfort in hot weather it is desirable to cool the solution, or add a little more bromide of potash when developing these papers.

R. ED. LIESEGANG.

ROYAL PHOTOGRAPHIC SOCIETY: REPORT OF THE COUNCIL FOR THE YEAR 1900.

[Presented to the Members at the Annual General Meeting on Tuesday, February 12, 1901.]

THE MEMBERSHIP.

THE following table shows the changes that have taken place in the numbers of the Fellows and Members of the Society during the year:

	Honorary Fellows.	Life Fellows.	Fellows.	Life Members.	Members.	Non-resident Members.	Total.
DURING 1900—							
Enrolled	2	1	11	5	83	0	102
Transferred from other columns	0	0	0	0	1	0	1
	2	1	11	5	84	0	103
Died	0	0	3	1	2	0	6
Resigned	0	0	4	0	28	0	32
Transferred to other columns	0	0	1	0	9	0	10
	0	0	8	1	39	0	48
On January 1, 1900	7	43	204	60	457	19	790
To add to above	2	1	11	5	84	0	103
Total	9	44	215	65	541	19	893
To subtract as above	0	0	8	1	39	0	48
On January 1, 1901	9	44	207	64	502	19	845

[1] This was not a case of stand development according to Meydenbauer's method. The developer we used (ordinary rodinal) was of normal strength for rapid development. This is of importance in connexion with sulphite, as by dilution it loses much of its power as a solvent of bromide of silver.

There has been a net increase during the year of 55 mmbers. Those ıst to the Society by death are:—Thomas Fall, W. Vanner, Leon Varnerke, Arthur Barclay, J. Grant-Birch, and H. Paget Swaine.

Mr. Frank Haes has been elected an Hon. Fellow of the Society in ɔnsideration of his long connexion with photography, and especially ır his gratuitous photographic work for the Egypt Exploration Fund.

Mr. Henry P. Robinson has been elected an Honorary Fellow of ıe Society in consideration of his services to photography and to this ɔciety in the past.

PROGRESS MEDAL.

The Progress Medal has been awarded by the Council to Monsieur ɔuis Ducos du Hauron for having initiated three-colour heliochromy ı a working process. The medal was transmitted to him through ıe French Ambassador in London. The Council have arranged to ld to the list of recipients of the medal published annually in the ctober "Journal" the reasons for which the medal has been awarded.

ACCOUNTS.

The total receipts for the year, including the balance of £244 10s. d. brought forward, amount to £2,440 5s. 2d., and the expenditure as £1,913 16s. 6d., leaving a balance of £526 8s. 8d. less the lia-lities as shown £63 16s. 10d., to the affiliated societies and £25 to essrs. Harrison and Sons on account of December number of the Journal." The amount received on account of guarantee fund, £62 ɔs. 6d., was for payments due on the first call. It has not been nsidered necessary to make any call on the fund for the last year. ıe Exhibition proved a success, and, after all expenses were paid, cluding the half-year's rent outstanding on the Pall Mall Gallery, ere remains a small balance in favour of the Society.

THE EXHIBITION.

A prominent feature of the year's work was the removal of the xhibition to the New Gallery. The Council are of opinion that the sults fully justify the anticipations expressed in their last report. ctions were devoted to selected pictorial photographs, professional otography, apparatus displays, photo-mechanical work, and general ientific and technical photography. The attendance during the Ex-bition, which was open five weeks only, as compared with seven eks previously, reached a total of 10,553. The thanks of the Society e more than ever before due to the Organizing Committee, who ring the whole year, have been constantly meeting in connexion th the work entailed by the Exhibition, the success of which is ry largely due to their labours. The thanks of the Society are also ıe to those gentlemen who acted as Judges, and as members of the lecting and Hanging Committees.

The following table compares the details of the Pictorial Section of e Exhibition with those of the few preceding years:—

Year.	Frames.	Photographs.	Portrait and Figure Subjects	Landscape & Architecture.	Miscellaneous.
1895	459	615	174	287	154
1896	353	361	96	208	57
1897	437	463	135	240	88
1898	423	443	126	257	60
1899	368	393	98	218	52
1900	350	350	130	L. A. 118 35	67

The following table gives a classified comparison of the exhibitors ring the past few years:—

Year.	Members.	Non-Members.	Town.	Country and Foreign.
1895	78	129	113	94
1896	71	97	86	82
1897	67	111	97	81
1898	80	116	99	97
1899	74	107	86	95
1900	85	158	91	152

There were also 180 lantern and stereoscopic transparencies from enty exhibitors and eight pieces of apparatus from three exhibitors. e number of entries in the competitive sections was 1,520, from 418 lividuals, and the number of exhibitors whose work was accepted was 5. There were twenty-nine foreign and colonial exhibitors from ɔ following countries, namely, Belgium, Denmark, Germany, Italy, naica, and Switzerland, one each; Austria, and France, two each; stralia, five; and the United States of America, fourteen.

The Exhibition was open daily for five weeks, and on Monday Thurs-y, and Saturday evenings, the total amount received for admissions ng £322 1s.

Lantern lectures were given at the evening meetings, and the nks of the Society are due to those who so readily attended with lent their slides and enabled the displays to be varied on each asion.

HOUSE EXHIBITIONS.

A new and popular feature of the Society's work during the past year has been the series of successful House Exhibitions. These were inaugurated in January by an exhibition of Mr. J. Craig Annan's photographs, followed by those of the National Photographic Record Association, Mr. Frederick H. Evans, Dr. P. H. Emerson, and of the "New American School," the last-named by the kindness of Mr. F. Holland Day. The series will be continued throughout the year 1901. Several photographs from these Exhibitions have been acquired by purchase for the permanent collection.

THE "JOURNAL."

The "Journal" has been published monthly as usual. Efforts have been made to illustrate it more fully with pictorial supplements and figures, &c., in explanation of the text. The Editor is pleased to consider communications for insertion in the "Journal," as well as suggestions for improvement. The thanks of the Society are due to Major-General Waterhouse for undertaking some of the abstracting from foreign periodicals.

LIBRARY AND MUSEUM.

The Library continues to increase, donation, purchase, and exchange having added considerably to the collection. The catalogue under authors' names has been brought up to date, and every book has been numbered to facilitate reference. The Council desire it to be known that the Society is particularly anxious to keep the Library up to date, and any assistance that members can give by the donation of books will be greatly esteemed. The Council have under consideration the question of a printed catalogue.

The Museum has been enriched by the presentation of several small but interesting examples. The Society has a growing collection of objects relating to the evolution of photography, and it is hoped that these will be rendered more easy of access to members in the course of the present year. There must be many pieces of early apparatus and examples of processes in the hands of the members which, if brought together under one roof, would be invaluable as a means of showing what has been done in the past and the advance that has been achieved. The Council will be glad to accept or to receive on loan any articles such as these.

AFFILIATION.

The Societies affiliated with the Royal Photographic Society reached, at the end of the year, a total of eighty. The control of the business of the Affiliation has remained with the Executive Committee appointed by the delegates, this arrangement having proved more workable than the pre-existing method of administration. By the publication of the "Photographic Red Book," the Executive has got into much closer communication with the individual members of the affiliated societies, which represent now an aggregate of nearly 8000 photographers.

The rooms of the Society were placed at the disposal of the Traill Taylor Memorial Committee on November 16, when Mr. Frederic E. Ives delivered the third of the series of lectures—"The Optics of Trichromatic Photography."

Early in the year the Council had before them the replies to a circular addressed to the members with reference to the continuance or otherwise of an offer of medals for competition at the Annual Exhibitions. Replies were received from 142 members; after consideration the Council decided to continue the offer of medals.

The Council supported the protest formulated by the Photographic Copyright Union against the proposed new Artistic Copyright Bill. The Bill has been remodelled and will be again considered in due course.

During a temporary absence abroad of Mr. George Scamell, the Hon. Treasurer, the duties of this office were fulfilled by Mr. J. W. Marchant, to whom the thanks of the Society are due.

The set of specimen screw gauges for lens fittings and mounts having been found inaccurate in some respects, the Council have had a list of the known errors prepared and attached to the gauges. The printed schedule of standards remains in force.

The Council have been pleased to note the increasing interest taken by the members in the direction of the increase of the membership roll. They hope that these efforts will be more generally exerted, however, as it is only by maintaining a large membership that the successful career of the Society can be assured.

THE CAMERA CLUB.

THE February number of "The Journal of the Camera Club" is full of attractive matter of general interest. The notes and news are pithily written, and the other contents of the number are skilfully varied. Thus there are papers on Imogen, the new developer, by Mr. C. H. Bothamley; Photogravure, by Mr. Ignatz Herbst; "Jottings from the Journals," and a reprinted account of the Camera Club's first photographic excursion to Hayes and West Wickham. The re-

views and the serious and humorous poetry are products of highly skilled pens; and, altogether, this number of the Club "Journal" is so good and readable, that the new Honorary Editor must be heartily congratulated on commencing his duties in so successful a manner. The "Journal" pays the following well-deserved tributes to two highly esteemed gentlemen who have relinquished office in the Club after years of unostentatious service:—

"With much regret we have to announce the retirement of Mr. Basil E. Lawrence from the Editorship of the Camera Club 'Journal,' a responsible post which he has occupied with great advantange to the Club since February 1897.

"It is true that the charge of our organ has been in commission for the last year, but practically the work thereon has chiefly fallen to Mr. Lawrence.

"The conduct of the 'Journal' for these four years has been such as to do credit to our institution, and it has been well maintained, notwithstanding that the Editor has not received from the members, except in one or two cases, the assistance, either by the contribution of papers or otherwise, which he was entitled to expect.

"Fortunately, Mr. Lawrence is a gentleman of very versatile talents, and himself on many occasions filled the ample void in our columns with most interesting historical papers, which were much appreciated by those whose good fortune it was to peruse them.

"Only those who know the difficulty of getting out the 'Journal' can realise what gratitude the Club owes to Mr. Lawrence, who placed his whole heart in its production with the same earnestness which he gives to anything he undertakes. Another retirement which will cause widespread regret is that of Mr. J. Wallace Godfrey (late Hon. Secretary). To Mr. Godfrey himself we fancy that the rest from the labours of a position he has discharged so ably and indefatigably will be a much-desired and welcome relief. The most casual glance at the list of Club lectures during the period Mr. Godfrey was in office will afford convincing proof of the hard work he had to undergo in seeking out new subjects and new lecturers—many of them most distinguished men of science and letters, whose appearance at the Club rostrum was a tribute to the persuasive powers and genial personality of our late Hon. Secretary. The heavy burden of filling two posts thus left vacant has fallen upon Mr. H. H. O'Farrell, who will do his best to live up to the high standard of his predecessors."

From the full report of the recently held Annual General Meeting, which appears in the same number, we take the two concluding paragraphs:—

The names of the new Directors who, under Rule 19, are also the Committee of the Club, are as follows:—Sir W. de W. Abney, K.C.B., F.R.S.; Dr. A. D. Abraham; A. C. Beard; Thomas Bedding; R. M. Cocks; J. W. Cadett; R. W. Craigie; Earl of Crawford, K.T., F.R.S.; H. E. Davis; G. Davison; E. Ferrero; Rev. N. R. Fitzpatrick; E. H. Laurie; H. T. Lyon; P. E. Marshall; H. H. O'Farrell; A. R. Price; A. Pringle; Earl of Rosse, K.P., F.R.S.; D. G. Thomson.

Rule 5, as altered, now stands as follows: "The entrance fee shall be £5 but this shall not be exacted in the case of the first hundred members elected after Jan. 1, 1901, in which case the entrance fee shall be £1. The entrance fee for foreign members, as long as they continue to be such, shall remain, as heretofore, £1, but any foreign member becoming a town or country member shall pay an additional entrance fee of £4."

THE LATE J. HARRISON.

We are sorry to learn of the death of Mr. J. Harrison, of Leeds, inventor and maker of the once well-known head-rest bearing his name. He was one of the pioneers of photography in Leeds, having commenced business in that city in 1855, and had in his day a high local reputation as a photographer, being particularly successful with babies and young children. He began his career as a schoolmaster, and introduced a system of teaching the alphabet, receiving many testimonials from teachers and those connected with educational work. Through his invention and improvements on the old-fashioned type of rest, he will be remembered by those who lived in the photographic world of thirty years ago, when the dry-plate and shutter were almost unknown. He gave up business some years ago, and has passed away at the age of seventy-five.

Our Editorial Table.

THE THORNTON BROMIDE AND SIMPLEX PAPERS.

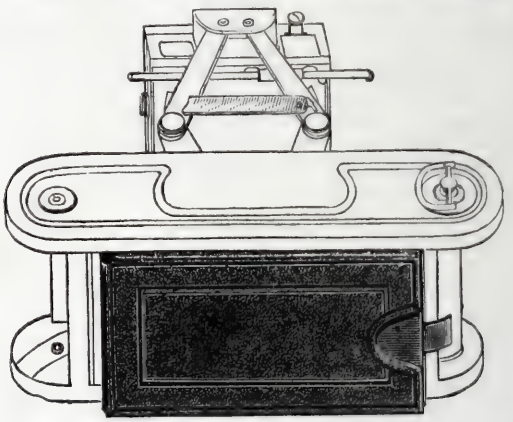
Manufactured by the Thornton Film Co., Altrincham.

Two recent additions to the productions of this Company are a matt surface bromide paper, to be manipulated in non-actinic light, and "Simplex," a paper which may be both printed and developed by artificial light or weak daylight. In connexion with the latter paper, the company announce monthly prizes for the best prints made upon it. The following are the conditions:—(1) Prints may be any size and any subject. Several prints may be entered by one competitor, if desired. (2) All prints entered must have been made during the preceding month, or, in the case of competitors abroad, during one of the two preceding months. (3) The prints, accompanied by the entry form, duly filled in and signed, must be sent by post direct to the Thornton Film Company, Ltd., Altrincham, Cheshire, not later than the third of the month in which the awards are to be made. They may be protected between pieces of cardboard in an envelope. (4) All prints become the property of the Company, who reserve the right to reproduce any of the winning prints for advertising purposes.

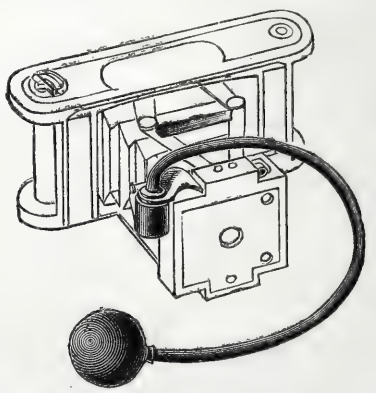
TWO USEFUL ADJUNCTS TO FOLDING POCKET CAMERAS.

Wholesale agent: Arthur Rayment, 125, Earlham Grove, Forest Gate, London.

The Guénault adapter, which permits the use of dry plates in folding pocket (film) cameras, is an ingenious device which has this week been brought to our notice by Mr. Arthur Rayment. It comprises (1) a neat rectangular frame, which is so exactly fitted that it attaches itself by friction to the folding pocket cameras without addition or



alteration; (2) three single dark slides (to fit into the frame), about $\frac{1}{8}$th inch thick, which are absolutely light tight, and the three together weighing slightly over 4½ ounces; (3) a loose frame, arranged to increase the distance between lens and plate when objects only 40 inches distant are to be photographed; (4) two nickeled metal bars, supplied with the necessary rivets; these bars can be readily riveted to the jointed struts in front of the extended apparatus in such a manner as to alter the focus by varying the width between the jointed struts, thereby lessening the distance between lens and plate. The foregoing detail, with the accompanying diagram, makes quite plain the simplicity and utility of the Guénault Adapter. It affords two advantages:—Firstly, the means of employing plates; and, secondly, the means of adjusting distance between lens and plates in folding pocket film cameras; and, further, it enables the operator to photograph very near as well as distant views, and to obtain with the folding pocket camera portraits, the size and style of which may be varied from the full-length figure to the large bust with head about



one inch long. The Guénault shutter release has also been brought to our notice by Mr. Rayment. To make successful pictures with short-timed exposures, a shutter possessing pneumatic release is essential for the avoidance of vibration, particularly when cameras of light weight are in use. The diagram shows above that the release arrangement attaches itself in a moment by friction to the folding pocket camera, and may be again disconnected from it with equal rapidity. The rubber bellows indicated within the slotted nickel metal cylinder releases the trigger, and holds open the shutter during the more or less prolonged (timed) exposure required. We may add that we regard both the adapter and the shutter release as unquestionable advantages,

giving efficient assistance to those desirous of obtaining perfect results. Their cost is such as to place them within the reach of all folding pocket-camera photographers.

Catalogue Received.

The Woodbury Photographic Printing Co., Great New-street, E.C.

The receipt of a copy of the new catalogue issued by this old-established house, which for some years has been in the proprietary of Messrs. Eyre and Spottiswoode, His Majesty's Printers, affords us the opportunity of referring to the facilities at the command of the Woodbury Company for producing photographic printing and enlarging work. Of those facilities we were enabled to judge on the occasion of the recent visit to the Company's premises at Downs Park-road, Hackney. Of the vast block of buildings daily in the occupation of about 2000 employés, who are chiefly engaged in the great letter-press printing business associated with the name of Messrs. Eyre and Spottiswoode, a specially designed section is occupied by the photographic (or Woodbury) branch. The department is of unique interest, in that it is now probably the only source from which lantern slides and prints by the admired Woodbury type process are obtainable in large numbers. At the time of our visit the lamented death of the Queen had created a sudden demand for portraits of Her Majesty on glass and paper. Some of the metal "moulds" that were being used were thirty years old, and they yielded images in pigment having absolutely sharp outlines. The singular beauty of Woodbury images, and the remarkable simplicity of the process leave room for surprise that photographers and the public do not bestow greater patronage on this kind of print—as permanent as it is rich in appearance. The collotype department at the Hackney Works is an important one, and when we were passing through it the largest machine of its kind in England was running. Besides impressions of a purely "commercial" nature, the Woodbury Company produce in great numbers collotypic reproductions of well-known paintings: plate-marked prints on suitable paper which have such high artistic excellence that their popularity for the decoration of the home is easily understood. The carbon process is another variety of photographic printing that is worked from "end to end," if the expression may be allowed, at the Hackney Works. The pigmented tissue is prepared and sensitised on the premises, and the process is employed for reproducing well-known paintings in the principal European galleries as well as for contact printing and enlarging for purely photographic purposes. Indeed, the printing roof, the developing, finishing and mounting rooms find occupation for one of the largest staffs of carbon printers that we have yet seen at work. The studio, in which objects are photographed for reproduction, is a magnificent room in respect of size, lighting, and convenience: it is accessible by a lift, so that machinery, large pictures, and heavy objects are easily placed in the line of the lens. Platinotype, bromide, and silver printing are also branches of the business. But the three distinctive specialities of the Hackney Works are the Woodbury, carbon, and collotype processes, which are there practised to perfection.

The catalogue, to which we referred at the opening of this notice, contains some well-executed views of the works, and a mass of details, prices, and other data of interest to the professional photographer. It is for the convenience of the latter that the Woodbury Works at Hackney largely exist: and we are expressing the merest truth in saying that finer specimens of photographic printing and enlarging have not come before our eyes than those which we saw being made on the occasion of our visit.

News and Notes.

The Gold Medal of the Royal Astronomical Society has been awarded to Prof. Edward Charles Pickering, of Harvard College Astronomical Observatory.

Royal Photographic Society.—Technical Meeting, Tuesday, February 19, at 66, Russell-square, at 8 p.m., Mr. W. Edwin Tindall, R.B.A., will read a paper enfitled "Imitative versus Creative—a Comparison," postponed from January 22 in consequence of the death of Her Majesty Queen Victoria.

Honour for Major-General Waterhouse.—The Photographic Society of Vienna, at its meeting on the 15th ult., elected Major-General Waterhouse as an honorary member, an honour which was only accorded to three others, namely, Karl Augerer, Dr. Bohm, and S. Pizzighelli. General Waterhouse has been a foreign member of the Society since 1882.

The "L. and P." Annual Supper will be held at the headquarters, "The White Swan," Tudor-street, London, E.C., on Thursday, February 28, at 7 p.m. Mr. Thomas Bedding, F.R.P.S., Editor of The British Journal of Photography, will preside. The musical arrangements are in the hands of the Hon. Secretary, Mr. Walter D. Welford, Warwick Lodge, 166, Romford-road, E.

The West London Photographic Society's Twelfth Annual Exhibition of Members' Work will be held on Friday and Saturday, February 22 and 23, 1901, at the Broadway Lecture Hall, Hammersmith, W. It will be open to members and their friends by invitation card, on Friday, February 22, from 7 p.m. to 10 p.m., and to the public free, on Saturday, February 23, from 4 p.m. to 9 p.m.

Mr. C. Ray Woods.—Many of our older readers will be interested to hear that Mr. C. Ray Woods, of the Royal Observatory, Cape Town, is in London on a short visit after eleven years' absence. He will remain here for a few weeks, and will probably attend some of the societies' meetings. Letters from any of his old friends desirous of renewing acquaintance will find him if addressed c.o. W. J. Woods, Esq., Elmhurst, Holly Park, Crouch Hill.

The Total Solar Eclipse of May 17-18.—As the time approaches, the usual interest is being aroused in the event, and its concomitant phenomena, one instance being seen in a communication to "Nature" last week from the President of the Koninkijke Natuurkundige Vereeniging at Batavia. The Board has applied for information about custom duties to the Government, and has received the folowing reply: "No duties will be levied on goods not exempted by the tariff, destined to be re-exported after the observation of the eclipse has been concluded; observing parties may obtain further information about custom duties from the officer at the port of arrival. Besides all possible facilities in having their goods imported, exemption from search will be afforded to scientific expeditions."

Death of Herr Ottomar Volkmer.—Photography generaly has suffered a great loss in the death of Herr Ottomar Eolen von Volkmer, the President of the Photographic Society, which occurred on the 20th ult. in his sixty-third year. Herr Volkmer was the Director of the Imperial State Printing Works at Vienna, and a Knight of some high order of every European country except France and England. He was the author of "Die Technik der Reproductionen von Militarkarten," 1896: "Betrieb der Galvanoplastik fur zwecke der graphischen Kunst mit Dynamomaschinen," 1888; "Die Photogaloanographie," 1890; "Die Photographie von Unsichtbarem," 1894; "Die Photogravure," 1896: and a constant contributor to the "Photographischen Correspondenz," Eder's "Jahrbuch," and the "Zeitschrift fur Electrotechnik."

The Dark Room a Cure for Measles.—According to a contemporary, Doctor Chatinière has just discovered what he believes to be a cure for measles. He has found that the red rays of the solar spectrum exercise a powerful action upon the disease. The treatment merely consists in placing the patient in the equivalent of a photographic dark room, that is to say, in an apartment into which the sunlight penetrates only through red curtains or in which lamps entirely shaded with red are used. The doctor and another practitioner have satisfactorily treated many cases of infantile measles by this method, a cure being obtained in two or three days, without the aid of any medicine. The secret of the treatment lies, Dr. Chatinière believes, in the fact that certain rays other than the red, notably the ultra-violet, produce a highly irritant effect on a diseased skin. He says that he has observed women in the Vosges wrap their children in red clothing when suffering from measles.

National Photographic Record Association.—A very valuable addition to the collection now being formed by the Association has just been made by the editor of the "Amateur Photographer" of the prints sent in from all parts of the kingdom in competition for the series of prizes offered by that paper. They include a series of Tintern Abbey and Gloucester Cathedral, by R. W. Dugdale; some of the old houses and other objects of antiquarian interest in Ludlow and Shrewsbury, by F. R. Armitage; Kirkstall Abbey and Ely Cathedral, by H. W. Smith; Details of the Old Church of St. Peter's, Northampton, by E. J. Felce; Worcester Cathedral, by F. Littledale; some copies of the Old Registers at Hartley Mandit Parish Church, by the Rev. A. C. Hervey; the Sepulchre, St. Andrew's Church, Heckington, by F. Parkinson; and an interesting collection from Ireland, including a set from Roscommon, Tinnulus of New Grange and of Dowth, St. Declans Cathedral, and many of the Old Stone Monuments forwarded by A. Hogg. Mrs. F. M. Muriel and Miss M. Cotton: and from Wales some of the Old Crosses at Llantwit Major, by J. G. Clarke, the total number of prints amounting to 142.

The great stimulus that has been given during recent years to public interest in the occupations and pursuits of country life, and more especially in the garden and garden design, has induced the proprietors of "Country Life Illustrated" to prepare for the press an illustrated work, entitled "Gardens Old and New: The Country House and its Garden Environment." Hitherto no such work has existed. Amid the countless volumes that have been issued there is not one that deals as this does with the greater features of garden design. The system of the book is one of example more than of precept. There is no attempt to enforce a special character, nor to advocate the claims of any particular style. Rather, the object has been to illustrate the merits of many styles, and to show how all are appropriate to particular houses and how they harmonise in special situations, and to illustrate in a manner unexampled, and with a richness never before attempted, the greatest and most interesting gardens in England—gardens which have no equals in the world—and to bring before the reader the most splendid and instructive examples of garden beauty and character. Every picture shown in the volume is from a photograph specially taken. In short, "Gardens Old and New: The Country House and its Garden Environment" is one of the most charming pictorial volumes issued within recent years.

Lick Observatory Eclipse Expedition.—The University of California will send out to Sumatra from the Lick Observatory an expedition consisting of an astronomer and assistants. Sailing on the 9th inst. they are not expected back till July. Their destination is the West Coast of the island, and it is intended by them to set up their observatory camp somewhere within twenty miles of Padang. The cost of the expedition like so much of the scientific work of America, is being borne by a private citizen, Mr. W. H. Crocker, of San Francisco, being in this case the generous donor of the funds.

A simple Hygrometer.—Mr. George M. Hopkins describes in the "Scientific American" a simple hygrometer, such as any one could make for himself, such an instrument being a very useful addition to the photographic outfit. A glance at an hygrometer, for example, now and then, would serve to warn against putting an unvarnished negative out to print with silver paper, would tell when to take steps to protect valuable cabinet work from atmospheric influences, and generally give warning of the photographer's enemy, damp. This particular hygrometer is simply made by glueing together two strips of elastic wood, one cut with, and the other across, the grain. One end of this double strip (twelve inches by one by one-sixteenth each piece) is fastened down to a block of wood nailed to one side of the end of a narrow upright board, a little longer than the strip, the hollow side of the strip facing the middle of the board. Moisture in the air causes the strip to buckle or bend, and a pin thrust point outwards in the end of the strip serves as an indicator working against a strip of cardboard nailed to one end of the narrow board alluded to. A maximum and a minimum of moisture in the air may be shown by this board by first exposing the slip in a closed vessel with pieces of damp blotting-paper (not touching it), and again in a closed vessel with chloride of calcium. The various curvatures taken by the strip may be marked off at the indicator, and the space between graduated to show how near to or far from completed saturation the air may be at the time the instrument is examined.

Affiliation of Photographic Societies.—Seventeenth Meeting of the Executive Committee, held on January 17, 1901, Mr. H. Snowden Ward in the chair. The draft of the annual report was submitted, and, with certain amendments, was approved, and ordered to be published, with the Treasurer's balance-sheet. The Committee dealt with the question of new lectures for the current year. Steps were taken for the provision of a number of lectures on interesting topics, of which particulars will be given when the negotiations are completed. It was agreed to delay the publication of the "Red Book," so as to include the new Executive Committee, to be appointed at the Annual Meeting. — The Annual General Meeting was held on January 29, 1901, Mr. Alexander Mackie in the chair. It was announced that the Zoological Society of London had consented to recognise the "Red Book" as a form of permit to photograph in their Gardens. The report of the Executive Committee was read. With a few amendments, the report was adopted, on the motion of Mr. Freshwater, seconded by Mr. Hilton Grundy. The balance-sheet was read and explained, and duly adopted on the proposition of Mr. C. H. Oakden, seconded by Mr. C. Churchill. The following officers were appointed:—Chairman: The Right Hon. the Earl of Crawford, K.T.; Treasurer: Mr. G. Scamell; Auditors: Messrs. F. W. Banister and W. H. Wilshere: Executive: Messrs. R. Beckett, C. Churchill, C. G. Emery, A. Mackie, E. Marriage, J. C. S. Mummery, C. H. Oakden. H. Vivian Hyde, H. Snowden Ward, and W. R. Stretton. A vote of thanks was passed to the retiring officers and the Executive for their work during the past year.

Astronomy for Beginners.—At the last meeting of the British Astronomical Association Mr. Edwin Holmes read a paper entitled "A Chapter for Astronomical Beginners"—the outcome, as he explained in his introduction, of various questions addressed to him by people who were unable to understand the ordinary apparent phenomena of the heavens in connexion with the Solar System, and who, like himself, had not met with any elementary book which explained them so as to be understood of the unlearned. "The manuals contain the data of the orbits of the planets and satellites given with the utmost exactness, and descriptive writing of the highest order abounds; the paths are traced on maps with loops and stationary points and places where they advance or retrograde on the background of stars, yet, when the ordinary reader has crammed himself with periods and distances and speculations, he is still at a loss, when confronted with the night sky, and cannot bring his book learning to bear upon his personal observations of the celestial motions." The author proceeded to deal in some detail with the why and the wherefore of many of the apparent phenomena, premising that "part of the difficulty of explanation arises from our natural habit of referring everything to the horizontal plane in which we live, and to this being neither the plane of the earth's rotation nor the plane of the earth's annual path round the sun. Another part arises from astronomers describing the motions of the various bodies of the Solar System as referred to the surrounding sphere of the fixed stars and as projected thereupon, and not with regard only to their apparent or real motions referred to the sun and earth alone; while a third part of the difficulty results from our point of observation being continually in motion." He pointed out how best to grasp the fact of our annual motion, and how to follow the apparent motions of the planets and their varying altitudes at oppositions. He explained very lucidly the reason for the varying altitudes of the moon, and her various altitudes when new, and concluding, said: "Since the new crescent moon lies approximately on her back in March, and the old crescent moon on her back in September, and the new crescent moon is upright in September, and the old crescent upright in March in our latitudes every year, they cannot take the place of 'Old Moore's Almanack' as prophetic of wind or rain, calm or storm; but as compensation for our loss of faith in this direction, we may regard it as certain that, whenever the new moon lies on her back in March, we shall have some kind of a summer about three months later, and, whenever the new moon is upright in September, that winter will follow in about a quarter of a year." In the course of the subsequent discussion, Mr. E. W. Maunder said that he thought Mr. Holmes had hit upon a real blot on many of their astronomical text-books—viz., that they did not sufficiently describe and explain the actual appearances presented to them in the sky. He supposed the question most frequently addressed to the Astronomer Royal at Greenwich Observatory, or to himself privately, was to ask respecting the planets Venus or Mars—"What could that strange star be?" It was clear, from such questions, that there was almost an entire ignorance of the actual aspect presented by the midnight sky night after night amongst the general population of the country, and not merely amongst those who might be called the uneducated. People had written to him asking what one planet or another was, who certainly had a fair average education; but they had no notion as to the actual apparent motions of the heavenly bodies. On one occasion a City bank-clerk wrote him that he had seen a very remarkable phenomenon. "It was a bright star," he said, "and it fell every night." He is quite sure it fell, because he had seen it from his front door, and it had gone down behind the roof opposite. Then he had ascended to the first floor, from which he had seen it fall again; and, finally, he had gone to the second floor, and seen it fall a third time. He evidently thought it was something very portentous indeed. It struck him (the speaker) that if they could bring home to a very much greater proportion of the population that at present took an interest in such matters that here was a real naked-eye astronomy which did not require instruments, but that simply required them to watch the changing aspect of the heavens intelligently, it would do such people good, and certainly promote a living interest in astronomy. It would, moreover, throw a good deal of light upon the early primitive history of astronomy because, however far they went back, they found a certain amount of knowledge of it which could not have been acquired except at the expense of a great deal of very patient thought.

Commercial & Legal Intelligence.

Maloni's Flash Lamps.—Mr. Maloni, of Ayr, sends us his latest price list of flash lamps. It is illustrated by some capital examples of work done with them.

Messrs. O. Sichel and Co., of 52, Bunhill-row, E.C., write: "We beg to advise you that we are now in a position to supply the Sickle self-toning paper in both the matt and the glossy surfaces."

Photographs of the late Queen's Funeral Procession.—In answer to "Monmouthshire" (a last week's querist), Mr. Alfred Underhill, of Clarendon-road, Croydon, Surrey, writes that he is prepared to supply such photographs.

The Sichel Developing Trays.—Messrs. O. Sichel and Co., of 52, Bunhill Row, E.C., and 20 Berners Street, are issuing a set of unbreakable developing trays. They are stamped of steel and are guaranteed to be acid proof.

Thornton Film Co.—The monthly prize for the bset negative made on the Thornton film has been awarded to Mr. R. W. Dugdale, 25, Kingsholme, Gloucester, for his negative of the "Entrance to the Crypt and Ambulatory of Gloucester Cathedral."

Among the few names announced in the "Journal Officiel," on February 2, of British subjects who have been honoured by the distinction of Chevalier of the Legion of Honour by the President of the Republic of France, was that of Mr. George Gilmer, principal of the well-known firm of opticians, Clement and Gilmer, of Paris. Mr. George Gilmer has lived in Paris for the past twenty-three years.

The Process and Engineering Company, of 66, Deptford Green, write: "Having received so many complaints from our customers that owing to our distance from town they are ununable to call and see our showrooms, and also having found difficulty in transport ourselves, we have great pleasure of informing you that taking advantage of the lapse of our lease here we are moving into a more central position. We shall be glad, therefore, if you will kindly note that as from February 7, 1901, our address will be 109, Farringdon-road, E.C."

The Warwick Trading Company, Ltd., of 4 and 5, Warwick-court, W.C., announce the issue of a large series of cinematograph films depicting incidents during the funeral of Her late Majesty the Queen at Osborne, Cowes, Portsmouth, Windsor, &c., &c.: Proclamation of King Edward VII., January 25, 1901; Heralding the Proclamation of the King at Windsor Bridge, January 28, 1901; the German Crown Prince leaving Portsmouth Harbour Station for Osborne, January 25, 1901; the Royal Family and German Emperor arriving at Whippingham Church, Cowes, for the Special Memorial Service on Sunday, January 27, 1901; His Majesty the King's return from London—leaving Portsmouth Harbour Station for Osborne, January 31, 1901; Panorama of Battleships assembled at Spithead for the purpose of paying their final tribute to the Memory of the late Queen; Panorama of the Three Royal Yachts anchored off Cowes, January 31, 1901. The Funeral of the Queen: The Funeral Cortege arriving at Trinity Pier; Queen Victoria's last progress through Her Fleet. London, February 2, 1901.—The Queen's Funeral

ageant entering Hyde Park by Apsley Gate; the Funeral at Hyde Park orner—Section 3—including the main portion of the Pageant; the rtillery and Bluejackets passing though Hyde Park; Bluejackets to the escue—the Funeral Cortege leaving the Grat Western Station, Vindsor; the Complete Funeral Cortege Passing through Windsor; rrival of Funeral Cortege at St. George's Chapel.

PAPER MAKING IN FRANCE.—The correspondent of a contemporary rites that he recently came across some statistics relating to the paper ade in France. The paper-makers held a kind of congress at Tours st year, and in the course of the discussions it came out that there re 241 paper makers in France. Nearly half of these—108—make only rapping papers, of which they turn out 148,000 tons per year. Newsapers and wall papers are made by only fourteen makers, to the extent of 2,000 tons in the year, but, as that cannot represent the paper consumed y the many thousands of French newspapers, it seems probable that a ood deal is imported. Twenty-six firms are described as making 59,000 ns of medium paper; thirteen others makes 53,000 tons of "ordinary;" nd there are twenty-seven mills which supply 31,000 tons of fine paper; hile twenty-six make a total of 15,000 tons of cigarette and silk papers. r, in all, 190,000 tons of fine papers, which, added to the 148,000 of wrapng papers, makes 338,000 tons. But the big firm of Darblay and Son is mitted from these calculations; and as they make 32,000 tons a year, hat brings the grand total up to 370,000 tons.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
.....	Bradford Photo. Society	Lantern-slide Making by Members.
.....	Camera Club	*Metamorphoses of Insects.* Fred Enock.
.....	Doncaster	*Printing in Pigment.* E. E. Burgess.
.....	Glasgow and West of Scotland .	*How to Use a Camera.* W. Goodwin.
.....	Birmingham Photo. Society ...	*A Holiday in the Land of Dickens.* James Gale.
.....	Gospel Oak	Beginners' Evening: *The Theory of Development,* J. E. Rayner; *The Theory of Toning,* H. Billingsley.
.....	Rotherham	*Carbon Process in Practice.* Autotype Company.
.....	Scarborough	*Nature Poets and Nature Pictures.* Percy Lund.
.....	Thornton Heath	Lantern Night.
.....	Borough Polytechnic	Lantern Night.
.....	Croydon Camera Club	Opening of the Fourth Photographic Exhibition.
.....	Woodford	*Pictorial Lantern Slides.* R. R. Rawkins.
.....	Camera Club	*Portraiture.* Harold Baker.
.....	Darwen	Demonstration: *Velox.* D. Nightingale.
.....	Hull	*Photographic Lenses.* Rev. H. P. Slade, F.R.A.S.
.....	Leigh	*Films and Plates, and the New Thornton Film.* W. D. Welford, F.R.P.S.
.....	Liverpool Amateur	Smoking Social.
.....	London and Provincial	Lantern Night.
.....	Bognor	Prints for Criticism.
.....	Croydon Microscopical	Set of Slides illustrating Scenes on the Pennsylvanian Railway. N. A. Ran.
.....	Tulse Hill and West Norwood...	Demonstration: *Enlarging, with Examples.*
22, 23	West London	Annual Exhibition.

ROYAL PHOTOGRAPHIC SOCIETY.

EBRUARY 12, — Annual General Meeting, — Mr. Thomas R. Dallmeyer, F.R.A.S. (President), in the chair.

The President, in referring to the death of her late Majesty Queen Victoria, which had occurred since the last Ordinary Meeting, expressed the opinion hat the least said about a great loss like this the better. As the members vere, doubtless, aware, a Special Meeting of Council was called, and a vote of ondolence with His Majesty the King and the Royal Family was drawn up nd forwarded through the Home Office. The text of this address was made known last week (see this JOURNAL, February 8). Having read the address o the meeting, the President, continuing, said photography was practically ne of the inventions of the Victorian era, and, although Her late Majesty's eign had been remarkable for glorious achievements and wonderful discoveries, t might truly be claimed that photography was one of the most important of hese discoveries, when one reflected upon the valuable assistance it had been o other branches of science. The Council of the Society had that evening uthorised him to bring before the members a matter bearing very intimately pon the well-being of the Society. In the Prince of Wales—now King Edward VII.—the Society had been honoured with a Patron since the death of H.R.H. the Prince Consort, who, with Her late Majesty, had been Patrons of he Society from its foundation in 1853 until their deaths. He begged to nove, therefore, that His Majesty the King be asked to graciously continue is patronage, and that it be the earnest prayer of this Society that, as successor to our late Queen, he be blessed with a long and prosperous reign.

Mr. A. H. Benham seconded the motion, which was carried unanimously.

NEW MEMBERS, &c.

Nomination papers in favour of fourteen candidates were read a first time, nd twelve candidates were balloted for and duly elected to the Society. The Widnes Photographic Society was announced as admitted to affiliation. Sympathetic reference was made to the loss, by death, of Mr. Otto Kitzerow, member, and of Mr. Henry Everett, who for so many years reported the Society's transactions.

PRESENT.

General Waterhouse presented a copy of Goethe's *Zur Farbenlehrer* (1810), in two volumes; and Mr. Frank Haes, an Honorary Fellow, made the Society a gift of five framed photographs of animals, chiefly on wet collodion and taken in the sixties, for which votes of thanks were duly passed.

PROGRESS MEDAL.

The President expressed the pleasure he felt at being privileged to make the formal presentation of the silver progress medal, awarded to Dr. R. L. Maddox. So far as the world in general were aware, the work of this gentleman lay principally in photo-micrography, but the reason for which this medal had been awarded was that he was the introducer of the gelatino-bromide plate. Of few sciences was it possible to state that from a particular date advancement of a marked order commenced, but Dr. Maddox's discovery of the gelatino-bromide plate had, he believed, done more for photography than any other single invention had achieved. The President regretted that Dr. Maddox was unable to be present to receive his medal in person, but he had delegated Mr. Thomas Bedding, the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, to receive it on his behalf. The President thought Dr. Maddox was particularly happy in his choice, as it was in THE BRITISH JOURNAL, in the days of Mr. Traill-Taylor's editorship, that Dr. Maddox first published his formula for the preparation of the gelatino-bromide dry plate, and later during Mr. W. B. Bolton's *régime* there appeared a very high appreciation of his work. The President thereupon handed to Mr. Bedding the medal with a request that he would convey to Dr. Maddox his congratulations, and an expression of the Society's esteem.

ANNUAL REPORT AND BALANCE-SHEET.

The report (see p. 104) and balance-sheet were taken as read. The President in moving the adoption of the report referred with pleasure to the healthy condition it reflected, and stated that the Council had under consideration the question of a printed catalogue of the Library. Mr. C. H. Oakden seconded and the report was adopted.

The Treasurer (Mr. G. Scamell) moved the adoption of the balance-sheet, drawing a pleasing comparison between the present satisfactory state of affairs and the year 1860, when the excess of expenditure over income reached a figure of 354*l.* Mr. Sebastian Davis seconded, referring appreciatively, as an old Treasurer, to the work of Mr. Scamell. The motion was carried *nem con.*

ELECTION OF OFFICERS, COUNCIL, AND JUDGES.

Mr. R. Beckett read the report of the scrutineers, which announced that the following gentlemen had been elected to the offices named.—*President:* Thomas R. Dallmeyer, F.R.A.S.—*Vice-Presidents:* The Right. Hon. the Earl of Crawford. K.T.; Chapman Jones, F.I.C., F.C.S.; J. W. Swan, M.A., F.R.S.; Major-General J. Waterhouse, I.S.C.—*Treasurer:* George Scammell. —*Ordinary Members of Council:* Thomas Bedding, Thomas Bolas, C. H. Bothamley, F. A. Bridge, A. Cowan, P. H. Emerson, W. B. Ferguson, John A. Hodges, H. Vivian Hyde, Rev. F. C. Lambert, A. Mackie, J. W. Marchant, Prof. R. Meldola, E. Sanger Shepherd, James A. Sinclair, John Spiller, W. Thomas, E. J. Wall, H. Snowden Ward, J. B. B. Wellington.—*Judges. Pictorial Section:* P. H. Emerson, B.A., M.B.; Lieut.-Colonel J. Gale; G. A. Storey, A.R.A.; F. M. Sutcliffe; J. B. B. Wellington. *Technical Section:* Chapman Jones, F.I.C., F.C.S.; E. J. Wall; Major-General J. Waterhouse, I.S.C.

The President having thanked the members for his re-election, and expressed his determination to always keep the good of the Society at heart, votes of thanks were passed severally to the President, Council, and officers of the Society for their past labours, and to the Auditors and the Scrutineers for their recent help; and the meeting closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

PHOTOGRAPHY OF COLOUR.

FEBRUARY 7,—Mr. R. Beckett in the chair.

Mr. E. Sanger Shepherd, who gave a lecture upon this interesting topic, said the subject was so very wide that it would be impracticable to refer in the time at his disposal to more than one of its branches, and that the representation of coloured objects in their natural colours. The solution of this problem had come about by the united efforts of a large number of independent investigators. The germ of the process was made, back in the century before last, by Dr. Thomas Young, who first published the trichromatic theory of colour, upon which all successful processes of colour photography are based. The decomposition of white light by means of a prism into the spectrum colours and their study forms a fitting introduction to the question of colour photography. A beam of white light from the lantern was projected upon the screen through a narrow slit, and a prism was afterwards interposed, splitting up the beam into its component bands of colour from red, through yellow, green, and blue, to violet. Following the spectrum came a slide showing what happened when it was photographed on an "ordinary" plate, the result, of course, only partially reproducing in monotone the spectrum colours, and demonstrating its inadequacy for colour photography. Compared with this, the photograph of the same spectrum on the Cadett "spectrum" plate exhibited a vast improvement in rendering. The excellence of the results in present day colour photography was attributed by the lecturer entirely to these plates, and he felt that a debt of gratitude was owing to their makers for the splendid tool put in the hands of photographers, and especially colour photographers. The plate was practically sensitive to the whole range of the spectrum, and although its blue sensitiveness was greater than the red sensitiveness, by means of a colour filter one was easily able to correct this and get a result agreeing almost exactly with the luminosities. It could now be said that orthochromatic photography was a very simple matter. Another slide was shown, one line representing the spectrum according to its luminosity, and another the

same photographic action, but in the form of a curve. Following this slide came one giving a list of a few well-known plates available for orthochromatic photography and curves indicating the particular colour sensitiveness of each. The following plates were named upon the list: Lumiere's A and B, Thomas's isochromatic, Edward's snap-shot isochromatic, Ilford chromatic, Lumiere's panchromatic, and the Cadett spectrum lightning plate.

The three-colour processes of photography are based upon the fact that all the colours of the spectrum and of nature may be counterfeited by mixtures of three colours—a particular green, a particular red, and a particular blue-violet. Maxwell, in 1861, suggested the making of three photographs, which should record the relative proportions in the original of red, green, and blue, and that from these transparencies should be made and projected, in superposition on the screen, the three transparencies being illuminated, of course, by light of the particular colour they represented.

Photographs produced in this way were shown at the Royal Institution, but there were then no commercially made colour sensitive plates available, and the results were not entirely successful. Mr. F. E. Ives took up the problem and devoted much time and skill to the improvement of colour photographic processes. He was the first to produce what were really satisfactory colour pictures by the three-colour process. Slides were then shown indicating the amount of action required respectively by the red, green, and blue, to reproduce the colours of the spectrum, and the action of the colour filters in sorting out the colours of an object. Diagrams were shown representing the partial superposition of red, green, and blue lights. Red and green produced a yellow patch, red and blue a pink patch, green and blue a blue-green patch, and in the centre where the three were superposed a white light. When dealing with three-colour films mounted one behind another and projected thus, a different method has to be followed. A sketch of the Ives chromoscope was shown demonstrating the production of the coloured image from the three records. There was also the Joly process, the principle of which was propounded by Ducos du Hauron. Here one record is taken through a screen ruled alternately with red, green, and blue-violet dyes. The width of line was the subject of much investigation, and, finally, eighty of each colour per inch was adopted. In Mr. Shepherd's own process three records were taken through different filters and prints therefrom were superimposed, each being stained a particular colour. A number of finished slides by this process were passed through the lantern. One of them, a tulip, was followed by an artist's conception of the same subject for comparison. Attention was then given to the questions of apparatus, more especially the plate and screen-holders. With plates of 200 to 240 H. & D., the exposure upon an open landscape at f. 22 would be something like nine seconds for red, three each for green and blue. Short development was best for colour work. One minute's development in the summer time, and two minutes in cold weather was his standard. Many fine specimens of his process were shown by Mr. Shepherd, who also answered a number of queries upon details of the method.

Mr. W. Thomas thought it would be a great convenience to ordinary photographers if a list of plates with curves representing their colour sensitiveness could be readily obtained. He thought it would be of value in deciding what plate to use for a given subject where one or another colour might predominate.

PHOTOGRAPHIC CLUB.

FEBRUARY 6.—Mr. J. W. Zahnsdorf in the chair.

Mr. E. W. Foxlee passed round a sheet of paper printed by Friese-Greene's electric process without ink in June 1899, at the Royal Photographic Society's Soiree. Some time after this function Mr. Muller showed at one of these meetings a similar piece of printed paper that had blackened nearly all over while carried in his breast pocket. The specimen Mr. Foxlee showed had likewise been kept in his pocket, but there was no tendency to blacken. The paper was, of course, chemically prepared, the electric current causing a decomposition at the points of contact, the face of types, for instance, and thereby a darkly coloured reprint of the types or design. He thought that probably some emanations from Mr. Muller's coat pocket or the dye used for the cloth had produced a similar decomposition and reduced the metallic salt or whatever the paper was treated with.

The Chairman remarked that wood-pulp paper, such as the piece shown seemed to be, would go black in time on exposure to the atmosphere. The whole question of paper he considered to be on a very unsatisfactory basis. Books of the present day would be non-existent before many years went by, while those of early times—the fifteenth and sixteenth century—would remain as good as ever. He hoped the time was not far distant when the Government would introduce some legislation on the subject of paper manufacture. Mr. S. J. Beckett sent some slides of the Funeral Procession of the late Queen, as seen from Hyde Park Corner, all of which, especially "the crowd," were much appreciated.

North Middlesex Photographic Society.—Feb. 4. Mr. Bynoe, from Messrs. Beck, attended and set forth the merits of the new Frena cameras, and also gave a dissertation on lenses in connexion with the new Beck-Steinheil lens, with which they are fitted. In the lantern slide competition, Mr. Rawkins and Mr. Lisett took, respectively, first and second places.

North Middlesex Photographic Society.—Feb. 11, Technical Meeting.—Mr. Norgate showed some slides by the three-colour process, also a print of a fox's head mounted, which was taken by the light of the moon with an hour's exposure. A novel way of using old celluloid films was as an illuminant: a print of a bunch of lilies taken by burning two or three films over the top of the camera was shown.

Brixton and Clapham Camera Club.—The 12th Annual General Meeting of this Club was held at Brixton Hall on Tuesday, Jan. 15, when a satisfactory report was presented by the Council. The following officers were elected:—President, W. E. Dunmore; Vice-Presidents, W. Fraser, F. W. Levett; Members of Council: A. R. Clinch, T. W. R. Cundall, R. Fisher, C. E. Scales W. Steers, H. C. Warren Williams; Librarian and Curator: W. W. Redmann; Lanternist: R. G. Mason; Auditors: H. N. Harvey, H. Rumble; Recorder; H. C. Warren Williams; Delegates to the Affiliation: F. W. Levett, W. H. Stoneman; Assistant Secretary: L. W. R. Cundall; Hon. Secretary: W. H. Stoneman, 11 Endymion-road, Brixton Hill, S.W. It has been decided to postpone the Annual Exhibition announced for March until the autumn.—On Tuesday, Feb. 6, Mr. Malcolm Fraser, a member of the C.I.V., gave an interesting lecture on his experiences with the forces in South Africa, and some 150 slides were shown graphically illustrating the life led by the regiment. The slides included scenes on board ship, in camp (washing, cooking, tent-pegging, &c.), the marches, the journeys in trucks, and the difficulties of transport. Several photos were specially taken to show the terrible nature of the country and the difficulties our Army had, and still has, in subduing the enemy. A notable slide was one showing Colonel Mackinnon marching on foot at the head of his regiment, disdaining to ride, and preferring to share with his men the hardship of the march.

West London Photographic Society.—February 8. Mr. A. E. Cockerell gave a successful demonstration of enlarging, using a home-made lantern with incandescent gas and an ordinary ½-plate camera and R.R. lens as the projecting apparatus. In a discussion which ensued, Mr. F. C. Hart called attention to the feasibility of enlarging from ¼-plate negative without a condenser by using incandescent gas, the burner being placed in a large opal globe. The size of globe he used was eight inches in diameter, and he secured even illustration.

Liverpool Amateur Photographic Associat on.—February 7. Mr. T. G. Ames, of B. J. Edwards & Co., gave a practical demonstration before this Society on lantern slide-making with Kristal plate. The operator produced some slides of a very good quality, and afterwards passed through the lantern a number of slides in duplicate showing, respectively, the advantage of isochromatic over ordinary plates in photography.

Patent News.

THE following applications for Patents were made between January 28 and February 1, 1901:—

BINOCULAR MICROSCOPES.—No. 1903. "Improvements in Binocular Stereoscopic Microscopes." K. FRITSCH.

CAMERAS.—No. 1932. "Improvements in Photographic Cameras." Complete specification. J. ADLER.

FILM CAMERAS.—No. 1973. "Improvements in Film Cameras." Complete specification. O. MOH.

CAMERAS.—No. 2107. "Improvements in or connected with Photographic Cameras." A. PRINGLE and H. S. STARNES.

SHUTTERS.—No. 2121. "Improvements in Photographic Lens Exposing Shutters." C. HOWELL and G. L. MOORE.

PROJECTIONS.—No. 2152. "Improvements in the Method of Projecting Coloured Lights, and for Imperceptible Changes from one Coloured Light to another, for Stage Purposes and otherwise." I. ROBERTSON.

FORTHCOMING EXHIBITIONS.

1901.

February 16–March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.

" 20–27 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath, S.E.

" 23–March 2 Birmingham Photographic Society. Hon. Secretary, H. Vooght Cornish, Athletic Institute, John Bright-street, Birmingham.

March 2–9 ..... South London Photographic Society. Hon. Secretary, Frank Goddard, Vanbrugh Hill, Blackheath, S.E.

" 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

A CAUSE OF DELAY.

To the EDITORS.

GENTLEMEN,—Fourteen days ago a high wall adjoining our place was blown down, smashing in our studio and work-rooms; it has al-

eady been a great loss to us. We have had to refuse many orders, ncluding one firm's for medallion photographs of our late Queen, King and Consort—running into millions—it has also retarded our rdinary work to a serious extent, and we trust our numerous customers vill be patient for a few days longer, when we hope to complete most rders on hand. New rooms are being fitted, and no energy will be pared to meet all requirements added to all this trouble.—I am, yours, tc.,

ROBERT FLAMANK.

February 9, 1901

WILD-LIFE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Though a great admirer of the photographs of Messrs. R. B. Lodge, Pike, and C. Kearton, I should like to correct Mr. Raeburn's history.[1]

He says, "It is a matter of barely ten years or so ago since the camera began to be employed at all in the portrayal of wild animals and birds in their native haunts."

As a matter of fact, it is nearly, if not quite, twenty years since Mr. Greene, of Berwick-on-Tweed, published a grand series of bird photographs, which found their way into museums and the hands of naturalists all over the country, and which, when shown at the Crystal Palace Exhibition in 1898, compared favourably with much modern work. Mr. C. Reid, too, has for years been doing excellent work of this kind, and can remember some good examples by Mr. B. Wyles. Mr. Cotton, too, whose photographs illustrated Dr. P. H. Emerson's 'Birds, Beasts, and Fishes of the Norfolk Broadland," published in 1894, produced many good photographs at an earlier period than that named by Mr. Raeburn. In the United States splendid photographs have been taken by Dr. Schufeldt—in my opinion the best wild bird and animal photographer of the lot—and others. Nor must Messrs. Dixon's and Gambier Bolton's fine work be forgotten. Excellent as are the photographs of Messrs. Lodge and C. Kearton, they are late arrivals in the field, but none the worse for that, nor do I believe they would wish to take credit for what is not theirs—'priority"—that low phrase of dealing belongs to a section of our 'soulful and earnest photographic artists."—I am, yours, &c., X.

February 9, 1901.

VARNISHING NEGATIVES.

To the EDITORS.

GENTLEMEN,—You may like to have some confirmation of the views you express as to the preservative effect of varnish on gelatine plates. I was lately looking over a considerable number of negatives, nearly all of which were taken before 1890, and some dated back to 1882. Some were varnished, some coated with collodion, and some unprotected. I think all the varnished negatives were unchanged, and certainly a large proportion of the unprotected ones were more or less spoilt; but what specially struck me was, that the plates coated with collodion were, for the most part, uninjured either by printing stains or by other deposit. The plates were of various makes. I cannot say whether some were better than others; but I happen to know that of one particular batch, taken in 1883 on plates by the same maker, some were perfectly clean and good; others were fine examples of red and green fog, and of the metallic-looking deposit which is the worst form of the fog.

Some home-made plates—slow—I noted with satisfaction had withstood the test of time fairly well. The inspection resulted in a rather wholesale destruction, so that I am afraid I have no evidence to support my statement.

I was, however, confirmed in my opinion that a coating of collodion is all that an amateur need give to most of his negatives. If he has one from which a large number of prints are wanted, he had better varnish it.—I am, yours, &c.,

H. T. WOOD.

16, Leinster-square, W., February 10, 1901.

QUEEN VICTORIA AND PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I can fully endorse all you have said in the last few numbers of your JOURNAL regarding the great interest our late Queen took in photography, and in her photographers. Personally, many of us can testify to this. Some time before the death of the late Jabez Hughes, Her Majesty stopped her carriage in the roadway to inquire for his health. Years ago, when I had to relinquish my ceramic business on account of ill health, Her Majesty directed her Secretary to write, saying "how sorry she was, and hoped I would soon be well, and, if unable to write myself, would Mrs. Henderson do so, and say how I was getting on;" and later on, when I was at Grasse, I wished to photograph Her Majesty in the donkey carriage. The day appointed being unfavourable (wet), I was asked if I would take the portrait in the large dining-room. I replied that I would try, but would fail on account of the light. Her Majesty then came out in the rain, and, when approaching, said, in her beautiful soft voice, "I know you are not strong; put your hat on." Her Majesty never seemed to forget her tradesmen. It became almost a by-word with me that I should go to the city on Christmas mornings for the Queen's Christmas box, viz., a small commission. This occurred so often that it could not be taken as a coincidence. I had made arrangements to spend this spring at Bordighera or Cimiez. The day before the Queen last left Cimiez I was honoured with sittings, and I took twelve good negatives. Such kind sympathetic expressions could not but endear her to one. They will ever remain engraved on my heart. We shall never see her like again.—I am, yours, &c.,

A. L. HENDERSON.

Florence, Italy, February 9, 1901.

[1] See "The British Journal of Photography," February 1, 1901.

WHITE LEAD EMULSION FOR BACKING STEREOSCOPIC TRANSPARENCIES.

To the EDITORS.

GENTLEMEN,—I notice in the correspondence column of last week's BRITISH JOURNAL OF PHOTOGRAPHY an editorial reply about white lead emulsion for stereo transparencies. A very important instruction is omitted, however; that is, that the precipitated lead carbonate should be finely ground on a glass slab, or in a mortar. In case you think it worth while to send further particulars to your correspondent, I enclose a note of my way of working.—I am, yours, &c.,

WM. GOODWIN.

3, Lynedoch-street, Glasgow, February 11, 1901.

[We append the kindly details sent us by Mr. Goodwin, who is a successful stereoscopic worker. Lead carbonate (precipitated from solutions of lead acetate and sodium carbonate), after washing, should be collected on a filter, from which the paste is to be transferred to a glass slab or a mortar, and finely ground for about ten minutes. It is then allowed to dry, and again ground for a few minutes in spirits of wine. The paste is now added to some enamel or other plain collodion, and the whole vigorously shaken till a smooth emulsion results. It is now to be set aside for some hours, to allow all but the finest particles to subside. It should be tested from time to time by coating a small piece of glass, and, when a film the desired opacity is obtained, the emulsion should be carefully decanted into another bottle. The bottle should be well shaken some time before use. It is difficult to give exact quantities, as the result depends on the fineness of the ground carbonate and the consistency of the collodion. About as much of the carbonate as will lie on a sixpence should suffice for four ounces of collodion. The resulting film should be as free from grain as a lantern plate. EDS.]

AN UNFORTUNATE PHOTOGRAPHIC TOWN.

To the EDITORS.

GENTLEMEN,—I am truly sorry for "Opaque" (see last JOURNAL), or any one else who unfortunately takes to his place of business. Although the only brick studio in the town, no one ever made it pay. The "former proprietor and his two assistants and a boy" is all nonsense. The man came here almost penniless, and was to buy the business for £25; he paid £3 on account, and that was all the vendor ever got. About a month after he was sold up, the sale realising about 11s., I myself buying three good posing chairs for 3s. 6d. The bailiff was in on an average about twice a quarter. Afterwards he did get men to come as assistants, outdoor operators, &c., several of whom had to raise money on their belongings to enable them to get home again, as wages were an unknown luxury at this establishment. No doubt a lot of sitters were taken, being offered such marvellous bargains, but the photo dealers never got anything for the materials used; and, rumour has it, that after a couple of years the artist started another business, with dummy boxes for stock, and obtained £85 worth of goods on "tick," which he sold for £15, and then went to London, to send word back that he was dead. "Opaque" could do the same amount of trade if he followed this brilliant artist's methods. The premises have changed hands no less then ten times in about fifteen years. There are six other professionals here, and not five, as well as a few dozen so-called amateurs. Our coal porter will "take" you on Saturday afternoon or Sunday, with a soft waterbutt and other accessories for a background. The cheap trade is not so essential, as see my enclosed price list. Another professional here gets about 21s. per dozen cabinets. If "Opaque" would abandon all thought of a cheap line, and would raise his charges, he would be thought twice as much of; and let him understand that he is a stranger in a strange place, with people who have been robbed right and left by photographers. If he has money, and can keep his head up for a few years, no doubt he will succeed. If he has none, then let him sell his business at once, as he easily can do owing to the attractiveness

of his premises. My opinion is that a man with a limited capital only will prosper best at his native place, where he is better known. Three photographers here, who get good prices, have been established nearly half a century, over a quarter of a century, and twelve years' respectively, and are all as good as natives bred and born.—I am, yours, &c.,

PYRO-STAINED.

February 11, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

R. W. Wicks, 57, Clarence-square, Brighton.—*Photograph of H.M. the late Queen.*

E. Eccles, Broad-street, Bury, Lancs.—*Photograph of the proclamation of King Edward VII.*

J. A. Bellinger, Fore-street, Sidmouth, Devon.—*Photograph of a wreath for the Queen's funeral.*

W. P. Little, 30, South-street, Exeter.—*Photograph of reading the proclamation of King Edward VII.*

S. R. Penny, Coleshill-road, Sutton Coldfield.—*Photograph of proclamation of H.M. King Edward VII.*

F. Holloway, North-street, Carshalton.—*Photograph of the Royal train containing remains of Queen Victoria.*

J. F. Lewis, 4, Stratford-studios, Kensington, W.—*Two photographs of John Burns, M.P. Photograph of G. B. Shaw, Esq.*

W. Harrison, Holly Bank, Onchan, Isle of Man.—*Photograph of proclamation of King Edward VII. Photograph of Naval Brigade firing royal salute at Tynwald Hill.*

D. OSBORNE.—A threat of legal proceedings unless the goods are immediately delivered or the money returned is what we advise.

T. S. M. W.—Probably the idea in the mind of the writer involved the immersion of bromide paper in a solution of potassium nitrite, say 40 grains to the ounce. Dry in the dark, and preserve from the damp.

RESIDUE.—"CAREFUL" writes: "I have been told that it is just as well to put P.O.P., silver washings, toning baths, and fixing baths in one tub to settle for residues, and to hasten settlement liver of sulphur is a good article to use. Is that good advice?"—In reply: Yes. The liver of sulphur will precipitate the silver as sulphide.

BOOK ON GLASS BLOWING.—"SUBSCRIBER" asks us to mention the name of some book or books giving fullest information about practical handiwork connected with the management of glass tubing, bending,and fitting same to flasks and other manipulations such as are required in a chemical laboratory?—In reply: "Glass Blowing," by Mr. Thos. Bolas, published by Messrs. Dawbarn and Ward, 6, Farringdon-avenue, E.C., is a most admirable book.

COPYRIGHT.—"REPRODUCTION" asks if it is sufficient to secure the permission of the sitter for the reproduction of his photograph, or is it essential to secure the photographer's consent also; and, if so, has the latter the right to charge for this permission?"—In reply: If the sitter has paid for the photograph, he has the right of granting permission for its reproduction; if not, then the copyright is the photographer's, and the latter can impose a charge.

PLATE-MARKING CARDBOARD.—"K. N. S." writes: "Will you please give me the address of a firm from whom I might get a press, or other machine, for plate-marking cardboard?"—In reply: Any rolling press, with heavy pressure will plate-mark—a copper-plate press for example, which may be had from any of the printing-press makers. A photographic rolling press will do very well for small sizes if the cardboard be backed up with an elastic material such as printers' blanketing.

SENSITISING CARBON TISSUE.—"CARBONIS" writes: "During the past month I have been sensitising my tissue on a 5 per cent. solution of bichromate of potash, instead of a 3 per cent. solution as hitherto, and I find that the sensitising is considerably increased. Do you think that it would be still further increased if I were to use a 5 per cent. solution of bichromate of ammonia in place of the bichromate of potash?"—Yes, we do; but there would be the "set-off," that the tissue would not keep so long after sensitising as it would with the potassium salt.

A COPYING DIFFICULTY.—R. LILE writes: "I have some difficulty in getting a correct copy of any photograph which I wish to take for enlarging purposes. There is always a sort of reflex light appearing in the negative. Can you suggest anything whereby this can be avoided? I send you a negative showing, in an aggravated form, what I mean."—In reply: The negative arrived broken into many pieces, but, from what we could judge from one or two of the larger bits, we should say that light finds admission into the camera through some small orifice or other. We should not like, however, to say positively that this is the cause, because the negative was in such small pieces.

BOOK ON COLOURING.—W. PLATT writes: "Will you please inform me where I can obtain a good book on water colours? I require a book giving information on the mixing of colours, and working same as applied to the finishing of photographic enlargements." In reply: Information is given in Johnson's "Retouching," published by Marion.

LENSES FOR PORTRAITURE.—"LENSES" writes: "I have been using a rapid euryscope lens for general purposes in my studio:—(1) Should I get a more brilliant and better defined image with a portrait lens, or is it a matter of careful focussing on the ground glass? (2) What class of lens do you consider best for ordinary portraiture?"—In reply: (1) Supposing the lenses are of equal quality one is as good as the other. The portrait lens, when used with its full aperture, will be the more rapid of the two. (2) A portrait lens, for the smaller sizes, because of its rapidity. It is the one most generally employed for portraiture in the studio.

DAMAGE TO STUDIO.—"GALE" says: "During the heavy gale on Sunday last a zinc chimney-pot was blown off, and broke several squares of glass, and one of the sash-bars, in the roof of the studio. On asking the landlord to do the necessary repairs, he said it was no affair of his, as I had the place on a repairing lease. But damage like this surely, cannot be classed as fair wear and tear? Can you please tell me who is responsible?"—In reply: We imagine that you are because it was your business to see that the chimney-pot was in good repair, i.e., in a secure state—particularly, as you say, in the latter part of the letter, that you have had the premises for five years.

LENS AND DEVELOPMENT QUERIES.—"T. G. K." writes: "Supposing I photographed an object twice, once with a cheap lens and once with a good one, using the same stop; should I have to give different exposures. If not, what is the meaning of a quick lens? (2) If I under-expose a plate slightly, is it possible, by modifying the developer, to get as good a negative as with a correctly exposed one?" In reply: (1) Supposing the ratios of the apertures are the same in each case, the exposures should be the same. The meaning of a quick lens is one that has a large aperture in proportion to its focal length. If the development is judiciously done, the difference between the two will be trifling only.

LENS FOR COPYING.—"H. W. G." says: "In a month or two I expect to get a contract for copying a large number of plans for a firm here, and they will have to be first class. The negative will have to be about 18×15. I know that the best lens for the work would be an anastigmat, but I cannot afford to purchase one. I have the offer of a Dallmeyer triplet of 30 inches focus which I can have for a very small price. Do you think that would produce good results when stopped down, as I have no other lens longer in focus than 18 inches?"—In reply: If you cannot afford an anastigmat, by all means secure the triplet, for it is really a very excellent one for copying, and it will cover the size plate you require with a moderate aperture.

ADDRESS WANTED.—H. N. KNIGHT writes: "Can you give me the address of any firm where I can obtain the dyes mentioned in the article by F. von Hubl, published in THE BRITISH JOURNAL ALMANAC for 1900 ("Tricolour Transparencies," p. 813). The dyes are Biebrich scarlet, methyl orange, naphthol yellow SL: echtgrun blaulich, methylene blue?"—In reply: methyl orange and methylene blue are common dyes and can be obtained from Penrose & Co., 8a, Upper Baker-street, W.C. Echtgrun blaulich can be had from F. Bayer & Co., of Elberfeld, Germany, who can also supply the others. We are not sure, but fancy Penrose & Co., can supply all of them.

GELATINE FOR COLLOTYPE.—"PERPLEXED" writes: "I enclose a sample of gelatine from which I get collotype plates that have small depressions in the film which print out slightly darker than the rest of the plate. I have tried it with simply boiled and filtered water (without bichromate) and the depressions are there just the same. Can you give me any idea as to the cause of this? I have been using this gelatine all through the summer and have not had the trouble, although I had it last winter about this time. An answer next Friday in your column would oblige, as I want to get some work in hand that I have to do."—In reply: It is evident that the gelatine is one that "pits," and you will have to get a sample that is free from this defect. We do not think you will be able to cure the evil in this sample.

SPOTS IN BROMIDE PRINTS.—F. E. EATON writes: "For the last two months I have been occasionally troubled with spots on bromide prints (as per specimen enclosed), which do not make their appearance until partly fixed, and, as only an occasional print is like the one enclosed, it is obvious that the fault lies in defective working. The prints are soaked in the ordinary way, then developed with amidol, which is again rinsed and transferred to fixing bath (of about 3 ozs. of hypo to the pint), for 10 minutes. After being in bath for about seven minutes the spots appear, and if left long enough would spread completely over the print. The fault, doubtless, lies in the fixing. I may say that I have been working exactly the same for about four years and have never experienced any difficulty before."—In reply: As you say the comet-like markings are due to defective working that is clear. It seems to us that there must be a number of solid particles in the developer when it is poured over the paper, as the tails of the comets are all in one direction. A little more care and cleanliness in the working will avoid them.

*** We are again obliged to hold over many answers to correspondents, letters, &c.

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EX CATHEDRÂ.

e Silent City Alaska.

The comment that we made, a fortnight ago, upon this recurrent fraud has brought a number of letters relating to the subject. Mr. Midnter, of Bristol, tells us that there has been much correndence about the mirage photographs in the press of t city, and he kindly encloses a cutting from the "Bristol mes and Mirror," which quotes this Journal as putting e quietus on the Silent City Fraud. We hope we ve. The Editor of "Invention" also reproduces our rks, and, after crediting us with a complete exposure of fraud, ironically suggests that the American "scientists" o propose investigating the mystery of the Alaskan mirage xt June should afterwards proceed to the Brocken to ntify the famous spectrum with the interior of the Lyceum eatre, London. The disreputable business easily lends lf to this and other kinds of well-deserved ridicule. Unfortunately ridicule does not always kill, as the French say would have us believe. Cases of the nature of that der notice demand far stronger treatment. It will atify us if the publicity we have given to the "Silent y" fraud relieves us of the necessity of again referring to it, and, as the imposture seems to have attracted some attention in the United States, we trust our American contemporaries will take cognisance of the remarks that appeared on this page a fortnight ago. To us it is the c se of deep pain that Photography, with its glorious wealth of beauty and utility, should so often be made the excuse for so much trickery, dishonesty, and other degrading practices. Disagreeable though the duty is, we shall not scruple when the occasions present themselves to put such things in their proper light. For the rest, we hope we may hear no more of this particular piece of business.

* * *

Acid or Alkaline Hypo for Plates.

For years past there has been a growing tendency to use an acid form of "hypo" solution for fixing gelatine plates; it is well known that many years ago Mr. Spiller showed that for, at any rate, albumenised paper, hypo did not remove the whole of the unused silver salt, and he recommended the addition of ammonia to the fixing solution to eliminate the last traces of silver. Though a silver bromide in gelatine is rather a different matter from a silver chloride and albumenate in albumen, there is sufficient similarity to give rise to suspicion that the whole of the unused silver salt may not be taken out of the film of a gelatino-bromide plate in the ordinary method of fixing. But, be that as it may, it has not prevented the acid bath from becoming popular, if only on account of the aid it is to the production of pure non-discoloured plates with steely-grey images. In a recent article in "Nature," Mr. Chapman Jones throws grave doubts on the permanency of negatives. "Acid fixing baths should be absolutely eschewed. The very grave risk that accompanies their use is not appreciated, or they would never be recommended." This is evidently a grave subject of consideration in view of the increasing popularity of such baths. Mr. Chapman Jones's theory is simple. "The effect of acids on stains due to oxidised developers is," he states, "to lighten the colour of the staining matter, and to render it insoluble. The action of alkalies is to darken its colour, and to render it soluble." It is difficult to prove the correctness or otherwise of this theory by the results of practice, as so few negatives have their data so collated as to enable the

disappearance of a portion of the image to be definitely shown. In the particular case which gave rise to the discussion, it will, however, be remembered that Dr. Isaac Roberts, as related in these pages, found that a number of stars had disappeared from his star negatives, and Sir Wm. Crookes was able to suggest a remedy which proved efficient. Here, however, there is no evidence that an acid bath had been employed; but we are able to give the views of a well-known photographer, who has employed an acid fixing bath for over a dozen years for every negative he has taken; they will count by tens of thousands. He has never found, so far as he could say, a single trace of fading in any part of a negative, except such as were clearly due to accident or carelessness. The vast bulk of his negatives appeared to be unchanged whenever they were brought out to be reprinted. It is his purpose to make a special examination to see if any trace of fading can be discovered. It need scarcely be said that all have been varnished before use.

* * *

Platinum and Carbon for Permanency. Mr. Chapman Jones may raise a hornet's nest in adjudging the palm for permanency to platinum. To use his own words, "A platinum print is probably more trustworthy as to permanency than a carbon print." There are platinum prints and platinum prints, carbon prints and carbon prints. We know that the platinum image is inalterable; the only point in which doubt exists is as regards the whites. A platinum print exposed to the air will eventually lose the purity of its whites; they become yellowy. A carbon print will depend on the pigments employed, as to whether or no it is permanent. Of course, a tissue could be made with Indian ink only, and the pigments and prints from it might be looked upon as absolutely permanent; but they would not be of an agreeable colour. Modern browns and warm blacks in "carbon" have generally the pigment made up to an agreeable tint by alizarine lakes or other colouring matters, and to that extent may be supposed to fade. The suggestion is made to have carbon transparencies for the record prints, and the idea possesses advantages. But, in the case, for example, of prints from star-maps, the carbon transparency (if upon glass, and celluloid is uncertain) is open to the objection of bulk and risk of damage by breakage. A far better plan would be to get a carbon print in Indian ink upon glass, to ensure the finest detail, and then to transfer it to paper with a specially fine surface in the usual manner. There would be no objection here to the air having access to each side of the film, as there might be with silver prints on paper. Such prints would be portable, light in weight, and show every detail of the original negative in a highly satisfactory manner.

* * *

Poisoning by Bichromate of Potash. Two cases of poisoning by this salt were reported last week, one of which ended fatally, and the other in serious illness. The ill effects of bichromate upon the skin of some persons are tolerably well known, but it is rare that it has been taken internally. We have a faint idea that, some years ago, there was a fatal case reported of poisoning by it. Bichromate of potash, however, is not scheduled as a poison in the Poisons Act, and it is vended freely by all oilmen and drysalters; yet it is seldom that any accidents from it are recorded, though it is so largely used in arts and manufactures. In the case which ended fatally, a solution of th salt was evidently drunk in mistake for beer. This accide happened in the warehouse of a firm of wholesale druggist and the verdict returned at the inquest was one of accidenta poisoning. The other case was this. It was an action trie in the Court of King's Bench to recover from Day's Metr politan Drug Stores, Ltd., damages for injury caused throug negligence on the part of one of the defendants' assistant It appears, according to the report as given in the "Sta dard," that the plaintiff went to one of the defendant shops for a pennyworth of nitre and a pennyworth of b carbonate of potash, which he had been recommended b a friend to take for rheumatism. In place of the bicarbonat of potash, he was given bichromate of potash, which h took, with the result that he became seriously ill, was i great agony, and for a time his life was in danger. In th end the jury awarded him £75 as damages. When the ma was served he was not told that the bichromate was a poison nor was the packet labelled "Poison." Bichromate of potas is not, as we have just said, scheduled in the Poisons Act but when it is purchased at a druggist's it is usual for it t bear a label indicating that it is a poison, but this was no the case in this instance. It is pretty evident that th plaintiff was not a photographer or he would have know the difference between what he asked for and that with which he was supplied. In neither of the reports of the cases referred to is anything said as to the physiological action of the bichromate, or the first symptoms of the poison ing. It would have been interesting if there had been, now that the salt is so largely used, and for so many purposes. In a list of poisons and antidotes before us we see that when the bichromate is taken internally it produces irritant pain in the stomach and vomiting, and that the antidotes are emetics and magnesia, or chalk. It may be well that this should be borne in mind by those who have to do with this salt, as accidents are possible at all times, even with the most careful.

* * *

The Sale of Poisons. A case of some little interest, though it does not bear directly on photography, wa decided in the Court of Appeal on Friday last. It is known that photographic dealers, unless they are registered phar maceutical chemists, must not sell any chemicals that ar scheduled in the Poisons Act—such as the bichloride o mercury, or cyanide of potassium, or solutions containing them, for example—without rendering themselves liable to a penalty of five pounds, payable to the Pharmaceutical Society. In the case referred to the defendant was a florist, and agent for the sale of a weed-killer which contained a poison. He took an order and the money for some from an informer of the Pharmaceutical Society, at the same time telling him that he could send the money on to the manufacturers, and they would forward the stuff if he preferred, as he did not supply it direct. The informer preferred that the florist should take the money, which he did, giving a receipt for it on the manufacturer's paper. Then the Society sued the florist in the County Court for their five pounds' penalty, and the Judge decided in favour of the florist, holding that he was a mere agent of the manufacturers, similar to a canvasser for them with authority to receive money on their behalf, and that he was not the seller within the meaning of the Act. This judgment the Society appealed against in a Divisional Court, and the appeal was dismissed. The Society then took the case to the Court of Appeal, and

e again it was dismissed, and the judgment of the two er Courts affirmed, with costs. From this judgment it uld seem that any photographic dealer, who is a bonâ fide nt for anything—say an intensifier or reducer—that con- ns any of the scheduled poisons, may take an order, and the ney for it, and send it on to the manufacturer, who will ward the material, but he must not sell it over the counter the ordinary course of business.

* * *

rishing per. As will be seen from our report last week, the subject of the present manufacture of per was one of the topics brought forward at a recent eting of the Photographic Club. One of the members, r. Zaehnsdorf, said that many of the books of the present y would be non-existent before many years went by, while se of early times—the fifteenth and sixteenth century—uld remain as good as ever. This is not a pleasant out- k; but most know that Mr. Zaehnsdorf is no mean autho- y on the subject. If stable paper was made several turies ago, why is it not made now? Possibly some is, t the great bulk of it is not. At one time paper was made ely from rags; now rag forms no part of many papers. ey are made largely of wood fibre, which is liable to ken and get rotten by exposure to light and the nosphere. Clay is also a large constituent of many dern papers. They often also contain hyposulphite of a used as an "antichlor," and sometimes chlorine. When se substances are taken into consideration, it is scarcely be wondered at that the present-day papers are not so od as those of a few centuries back, where rag only was ployed in their manufacture. If they were used solely the present time, considering the present consumption of per, it would be difficult even to conjecture what its price uld be. It is somewhat consoling to photographers to ow that the photographic papers are very different from e article generally used for newspapers, periodicals, and oks, though here the paper used for emulsion processes not of the same high quality as that employed for albu- nising, good though they be.

* * *

e Warnerke nd. In addition to the sums acknowledged on behalf of this Fund in last week's JOURNAL, have received £1 1s. each from Mr. Alfred Watkins and r. Fred Hollyer. We thank both gentlemen, whose con- butions we have passed on to the Honorary Treasurer. he latter (Mr. F. Ince, the well-known Honorary Solicitor the Royal Photographic Society) writes us as follows:— No doubt you have heard of the death of Mrs. Warnerke, d therefore what little we can raise will now only benefit iss Warnerke. I should be very glad if we could only ise enough to buy her a small annuity which would be fficient to keep her out of difficulties, but the money is t coming in very rapidly. We are going to have a meet- g of the Committee at Russell-square next week, and then e shall have to have a whip up and get in what we can, d close the Fund. I am very disappointed that we have t received more, because Mr. Warnerke was a thoroughly od fellow. He was always prepared to help any one, give em any information in his power, and I know with a cer- inty what probably no one else can know, that he was a ctim of circumstances in his latter days." The generous ibute which Mr. Ince pays to the memory of Mr. Warnerke will, we sincerely hope, stimulate further contributions to the Fund on behalf of Miss Warnerke, whose load of sorrow has been heavily increased by the recent sad death of her mother. We shall be glad to receive and acknowledge any further sums that may be sent us.

PRACTICAL NOTES ON DAYLIGHT ENLARGING.

MANY workers are deterred from employing daylight for enlarging by the belief that it means interfering with the structural portions or fittings of a room, such as having to cut apertures out of window shutters, and to rig up outside the window some form of ungainly reflector which would prove an eyesore to neighbours. This idea is quite erroneous. The fact is, the utilising of any ordinary room for the purpose of enlarging is a matter of much simplicity, and does not entail an amount of skill greater than is possessed by any ordinary individual, and does not mean the cutting of window shutters or rigging up any outside reflector at all. Most people can, with the aid of a hammer and a few nails, knock together with a few pieces of wood an inner frame that will fit tightly so as to shut out all daylight, and then provide an aperture in the frame to admit light through the negative, whilst the light may be diffused, not by means of an outside reflector, but by placing a sheet of ground glass a few inches in front of the negative. From time to time in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY particulars have been given as to the most convenient means of fitting an ordinary window with a simple screen for the purpose of enlarging, so that it is really not necessary to refer to the matter at any length in this article. The main fact to be borne in mind is that, once a worker enters into the spirit of the thing, he will never regret having expended a little trouble in fitting up an ordinary room for this purpose. The cost is a mere trifle.

Not the least of the several advantages which daylight possesses over artificial light lies in the ease and certainty of obtaining an equal illumination over the surface of the negative. It is well known that, by means of condensers used in conjunction with artificial light, it is difficult to obtain an equal illumination, and it takes a very expert operator to detect when a negative is not properly illuminated, although it may appear so to any one unaccustomed to the work. This fact will be very soon realised when exposures come to be developed. On the other hand, when even such a simple means as the interposition of a sheet of ground glass between the negative and the light is resorted to, and daylight employed, a most beautifully even illumination of the largest-sized negative is the result. A worker will not be long before he finds out that one of the chief factors towards success, after he has provided an effectual means for evenly lighting his negatives, lies in that one word, exposure. Here there is very little latitude, if only the highest-class results are to be turned out. It must be borne in mind that no two negatives will hardly ever be found which require the same treatment as regards exposure, and there is only one royal road to success, viz., by running a pilot and carefully seeing that no alteration in the power of the outside light has taken place since the trial piece was exposed, exactly the same developing solution being employed in all instances. One of the best plans to adopt for gauging the correct exposure undoubtedly lies in a free use of strips of the same sample of bromide paper that it is in-

tended to employ for the final enlargement, and it will be found to be true economy, to cut up into long strips a sheet of the paper, placing them over the densest shadows and strongest high lights displayed upon the enlarging board or easel. One strip of paper may often be cut into three or more portions, and varying times be given to each. On development it will be strikingly evident which is right and which is wrong. Since the introduction of such excellent samples of bromide paper, one of the great charms in enlargements produced with their aid lies in the purity of their colour when metol is employed as the developer, and with many workers this chemical has been adopted in preference to ferrous oxalate, which reigned supreme for so many years. It is a mistake to suppose that the changes can be rung in respect of colour by altering the developer. Pure high lights and good shadows can only be obtained by closely watching for the right time in exposure. Over-exposure means nasty greenish-yellow, and under-exposure produces general weakness of image, with poor, weak densities in the shadows, so that a worker would do well to realise the importance of finding the correct time to give, according to the stretch of the picture and the density of the negative.

Next to the importance of producing images of good colour comes that of providing as sharp results as the negative will yield, and there is more in this than many might imagine. A suitable lens must be employed, i.e., one capable of covering well the size of negative being enlarged, and if, as is often the case where portrait combinations are employed, spherical aberration be present, the lens must be stopped down considerably. One of the advantages attaching to the employment of portrait lenses lies in the comfort of being able to see the image clearly on the easel by reason of the amount of light they pass, when the focussing is being done with their largest angular aperture. Many excellent objectives are, however, condemned in respect of covering power, when, in point of fact, the fault does not lie with them at all, but actually with the operator himself. In work of this description the focussing is performed often by means of a front-extension camera, and, if the utmost care is not observed in placing the negative and rising front of the camera which carries the lens absolutely parallel to each other, the enlarged images will suffer in respect of sharpness, and nine times out of ten either the negative is blamed for want of sharpness, or the lens is not covering properly. A worker would do well to experiment in this matter, by seeing how small a lack of adjustment of the lens to the true plane of the negative will throw the image out of focus on the screen or easel.

To enable focussing to be accurately performed, there is no better plan than inserting a sheet of finely ground glass on the screen that carries the sensitive paper, and, at the same time, after the image has been brought to its utmost sharpness, finally examining the outside part of the image on a sheet of clean paper the same size as the sensitive sheet that is to be employed. Many negatives will come to hand for enlargement that are quite unsuitable, and there will also be those that require dodging in exposure, i.e., some parts will require shielding, so as to let the denser portions come up. A very little practice will teach a novice the enormous power that an operator possesses in this respect. A small piece of cardboard or a sheet of green glass wafted in the proper position in front of the lens, i.e., between it and the easel, will work wonders in producing high-class results, and in some instances, where the peculiarities of a negative are unknown, it is worth while to pull off a silv print from it, and study closely the behaviour of the neg tive during printing; by this means, especially where e largements of considerable size are produced, money will b saved by seeing where certain precautions must be taken t shield portions during exposure. Some delightful resul are obtained by vignetting. This is easily performed b inserting suitable cut-outs at a proper distance from th sensitive paper. These cut-out masks or vignettes are som times conveniently held in situ by nailing them on to a bo which has its top and bottom cut out, the box containin the vignette being placed on some support in front of th lens at the proper distance from the easel, or they may b nailed on to an upright rod, having a heavy base, which wi keep them in the exact position desired. In developing, i is important to observe, when first soaking the paper i water to cause it to lie flat, that all parts of the paper ar equally damp. When operating on very large sizes it i at times difficult to get the entire sheet absolutely flat o the bottom of the developing trough, but, with small size where handy dishes are used and plenty of developer applie this is not so liable to give trouble, and it is useful t have at hand a broad camel's-hair brush to guide the de veloper somewhat, but the best results are obtained when plentiful supply of developing solution is ap plied dexterously and kept constantly flowin over the surface of the sensitive image. De velopment by brushing is a particularly nice parlour o class-room experiment to show to amateur workers, and for small sizes, often yields nice results, but when workin on large images it is fatal to high-class results unless a elaborate amount of working up has to be eventually per formed. A brush is a useful adjunct for the developing table, but a plentiful supply of developing solution is th sheet anchor where nice level results are at stake.

NOTES ON THE DEVELOPMENT OF THE THEORY OF INTERFERENCE PHOTOCHROMY.

VII.—Lippmann's Formulation of the Theory (1894).

We first give two references which should not be omitted in history of interference methods, but are not discussions of principles Hermann Krone, "Ueber Farbenphotogramme von Spectren." *Wied. Ann.*, xlvi. (July 1, 1892), 426–430 (q.v.) H. W. Vogel, "Ueber di neue Methode der vervielfältigender Photographie in Naturfarben Sitzung vom Juni 17, 1892, *Verhandl. d. phys. Ges. zu Berlin, Wied. Ann.*, xlvi. (1892), 521–527. Here the direct processes are only mentioned, with the objections to them. The rest of this paper—a also the later one, "Ueber eine neue Methode der vervielfältigende Photographie in Naturfarben." *Verhandl. d. phys. Ges. zu Berlin* January 6, 1893, 1–5—bound up at the end of *Wied. Ann.*, xlviii (1893)—is occupied with the indirect method, which Vogel seemed to have preferred on account of its utility in process work.

We come now to Gabriel Lippmann's own mathematical formulation of the theory. It is by no means without interest from a purely mathematical point of view, and also, besides its real object as a uniting in a convenient form of several physical facts, it does an important service in emphasising the physical essentials which lie at its base, and which justify its claim to be considered as a "theory."

In 1894 Lippmann gave the mathematical theory of his interferential method for simple and compound colours.[1] The light falling on the plate is reflected at the back of the film, and thus, by interference, a system of stationary waves is formed. If the incident

[1] "Sur la théorie de la photographie des couleurs simples et composées par la méthode interférentielle." *Compt. Rend.*, cxviii. (1894) 92–102; *Journ de Phys.* (3), iii. (1894) 97–107; *Beibl.*, xviii. 761–762 (Dr. Classen); *Jahrb. über d. Fortschr. d. Math.*, xxv. (1893–94) 1611–1614 (Professor Wangerin).

ht is homogeneous (of wave-length λ), and the incidence normal, we t a series of parallel planes at equal distances from one another of ual photographic action; at the distance z from the surface of the m next to the mirror the intensity is $4\sin^2\frac{2\pi z}{\lambda}$. After the de-lopment of the photograph, that place z has a power of reflection pressed by $\rho=\epsilon\phi\left(\sin^2\frac{2\pi z}{\lambda}\right)$, a function of the intensity, where ϵ notes a coefficient which depends on the conditions of the experi-ent,[2] ϕ is an unknown function.

If now *homogeneous* light of wave-length λ^1 and vibration period falls on the plate, the ray reflected at the place z is determined by e equation:[3]

$$y = \rho dz \sin 2\pi\left(\frac{t}{T^1} - \frac{2z}{\lambda^1}\right) =$$

$$\rho dz\left(\cos\frac{4\pi z}{\lambda^1}\sin\frac{2\pi t}{T^1} - \sin\frac{4\pi z}{\lambda^1}\cos\frac{2\pi t}{T^1}\right)$$

uch a reflection is found at all depths z of the film,[4] and the sultant vibration is found by integration from $z=0$ to $z=Z$, where is the thickness of the film. The amplitude of the resultant vibra-on can then be conceived as the absolute amount of the complex uantity:

$$X + iY = \int_0^Z \rho\left(\cos\frac{4\pi z}{\lambda^1} + i\sin\frac{4\pi z}{\lambda^1}\right) dz.^5$$

The above integral can be resolved into a sum of integrals be-veen the limits 0 and $\frac{\lambda}{2}$, $\frac{\lambda}{2}$ and $2\frac{\lambda}{2}$, ..., which all reduce, by e substitution of $z+p.\frac{\lambda}{2}$ for z,[6] to integrals between the limits and $\frac{\lambda}{2}$

ρ does not vary with this substitution, and is therefore the same all integrals. So we have:—

$$X+iY=\int_0^{\frac{\lambda}{2}}(n\epsilon)\phi\left(\sin^2\frac{2\pi z}{\lambda}\right)\left(\cos\frac{4\pi z}{\lambda^1}+i\sin\frac{4\pi z}{\lambda^1}\right)dz.\frac{\Sigma}{n}$$

here—

$$\Sigma=1+u+u^2+\ldots+u^{n-1},\ u=\cos\frac{2\pi\lambda}{\lambda^1}+i\sin\frac{2\pi\lambda}{\lambda^1}$$

[2] One cannot increase ϵ indefinitely, but one can decrease it at will, by iminishing the proportion of sensitive matter contained in the transparent ayer, or by changing the mode of development. ρ is then a function of $\frac{z}{\lambda}$ lways comprised between 0 and 1, and having $\frac{\lambda}{2}$ for period.

[3] On entering the layer, the vibration in question has the equation: $= \sin\frac{2\pi t}{T^1}$ After reflection at an element at z of infinitely small depth dz he incident amplitude is multiplied by ρdz. At the same time there is a hase-loss, due to the path described 2z, and equal to $2\pi\frac{2z}{\lambda^1}$.

[4] This reflecting force is thus a continuous periodic function of the distance f the point from the reflecting back.

[5] By above integration we get a result of the form $X\sin\frac{2\pi t}{T^1} + \quad os\frac{2\pi t}{T^1}$

[6] Lippmann says: We pass from one integral to the following by changing into $z+\frac{\lambda}{2}$ (it is useless to make this change in ϕ, which has a period $\frac{\lambda}{2}$). We pass from one integral to the following by multiplyin- by u under the ign of integration. Thus we have:—

$$X+iY=\int_0^{\frac{\lambda}{2}}\rho\left(\cos\frac{4\pi z}{\lambda^1}+i\sin\frac{4\pi z}{\lambda^1}\right)dz.\Sigma.$$

The integral factor and Σ are always finite, the latter if $\frac{\lambda}{\lambda^1}$ has any frac-ionary value, except the number of its terms increases indefinitely. When Z increases indefinitely, n does, since $Z=n\frac{\lambda}{2}$ (as Z is very large compared with λ, we can suppose that $\frac{\lambda}{2}$ is contained in Z an integer number of times).

Now, one can choose ϵ, so that $(n\epsilon)$ is a finite constant. Further $\frac{\Sigma}{n}$ vanishes for infinite n, if λ^1 is not equal to λ, whilst $\frac{\Sigma}{n}=1$ for $\lambda^1=\lambda$.

Thus light of another wave-length than λ gives on reflection light of zero intensity; only light of that wave-length gives a perceptible intensity. Therefore on illumination with white light only rays of the wave-length λ are reflected. One is led to the same result if one uses, instead of the analysis, a geometrical construction for the composition of the reflected rays.[7]

The results are then: (1) the intensity of the reflected light decreases to zero with increasing film-thickness; (2) so long as the light is of other wave-length than the homogeneous light originally acting on the plate, only the light of equal wave-length, or of a whole multiple of it, keeps a finite value.[8]

The problem is more complicated when a *heterogeneous*, say white, light is used for obtaining the photograph.[9] Then we have, instead of ρ, the integral:—

$$\sigma=\frac{1}{z}\int_A^B f(\lambda)\phi\left(\sin^2\frac{2\pi z}{\lambda}\right)d\lambda,\quad \text{(A, B, being the limits between which } \lambda \text{ varies)},$$

where $\frac{1}{z}$ is put for ϵ. The integrals for X and Y will then be double, and the order of integration may be inverted. Replacing $\phi\left(\sin^2\frac{2\pi z}{\lambda}\right)$ by a series proceeding in cosines of multiples of $\frac{2\pi z}{\lambda}$ the single integrals so arising take the same form as a double integral considered by Fourier,[10] which reduces to one of its elements. Thus, for Z infinite, we get the result:—

$$\lim X=C_1 f(\lambda^1)+C_2,\ \lim Y=0;$$

where λ^1 has the same meaning as before; and these equations can be so understood that in taking the photograph every ray of white light acts just as if it alone were present.

If we suppose besides that the sensitiveness of the plate and the reflecting powers of the deposited silver particles are the same for all colours, then results that the light reflected from the plate must have exactly the same ratios of wave-lengths as that which illuminated the plate.

"The preceding theory is not only a little abridged on certain points, but incomplete on others. There is the influence of absorption to examine. This influence complicates the phenomenon and the formulæ; but the conclusions remain qualitatively the same.

"It is well to remark also that I have implicitly supposed the photographic deposit formed of reflecting molecules disseminated according to a determined law in a homogeneous medium. It is not impossible, at least in certain cases, that this medium has been altered chemically, so that, while remaining continuous, it acquires a variable index as a function of the space, and a reflecting power due to the variation of the index. The examination of this hypothesis would require another analysis."

The account of the first part of the paper given here is quite full: that of the second (when heterogeneous light is used), is much more condensed. The spirit of Lippmann's theory, is, however, sufficiently shown, and I think that the details will be better brought into evidence by a quite independent method of treating the whole question in all its generality. Meanwhile, we shall pass to the purely experimental researches of Wiener (1895), whose process of distinguishing between "Scheinfarben," and "Körperfarben," dispelled any doubts which might remain on the nature of the Lippmann colours, and gave, we may say, the final touch to the proof of the interference theory.

PHILIP E. B. JOURDAIN.

Cambridge, February 16, 1901.

[7] Due to M. Cornu; see Lippmann, *Compt. Rend.*, cxviii. 96-97.

[8] The case $\lambda=\lambda^1$ alone is realised in practice, because of the feeble length of the visible spectrum. To realise the case $\lambda=\frac{\lambda^1}{2}$ we would have to photo graph the spectrum fairly far in the infra red. In fact, one often sees the viole' begin beyond the red.

[9] See Lippmann, *loc. cit.*, 97.

[10] *Œuvres*, publiées par M. G. Darboux, i. 494.

ON A SUGGESTED ADVANCE IN THE PRACTICE OF THE LINE-SYSTEM OF THREE-COLOUR PHOTOGRAPHY.

"One plate, one colour-picture."

PENDING the discovery of practical pigmentary photography in natural colours—a consummation rendered thinkable by some encouraging facts, though not as yet by the handling of any very definite clues to research — we must resort to makeshifts when desiring to reproduce the much-desired hues of objects.

The Lippmann process, while sometimes yielding superb results, is extremely tricky, very slow, and involves special technical difficulties and exacting conditions of mounting and lighting, if its heliochromes are to be viewed correctly. It yields colour pictures which certainly do not meet the full wants of the seeker after "photography in natural colours," though they entail much delightful experimenting, vastly interest the scientific worker, and occasionally fascinate the artist—when he learns how and where to regard them properly so as to hit on the right angle of clear reflection! It may be that the Lippmann procedure touches only the fringe of researches that may later lead us on to the attainment of some more important results; for the present, however, it wears rather the look of a curious byway of science leading nowhere, save to a blank wall. Colour-workers, therefore, have to fall back on the makeshift devices of indirect three-colour photography.

My sole concern here is with the hope of simplifying and improving one of the various three-colour methods, viz., that known popularly as the "Joly," or "McDonough;" a method which constitutes the most approved translation of one of Ducos du Hauron's seed-ideas (the line system) into practice. As the "McDonough process" is now being so freely discussed, and so well placed before the eyes of the public, it will be convenient to refer to it alone; in essentials indeed, it is indistinguishable from the "Joly," and a separate discussion of the latter is accordingly unnecessary.

I shall assume that the general working details of the "McDonough process" are known to all my readers. An isochromatic plate is exposed behind, and in contact with a "taking" screen ruled with closely set parallel lines alternately of red, green, and blue-violet, an adjustable light filter being used to cut off the ultra-violet (and excess of blue) rays. The plate, developed and fixed, constitutes a monochrome negative record (in lines of varying density of silver deposit) of the white and coloured lights that may have affected the plate. From this negative record a transparency or positive record is obtained. This latter is placed in contact with a second ruled (or "viewing") screen, and by way of trial and error it is sought to get the transparent and partially transparent lines of the positive to register accurately with those colour lines of the screen appropriate to them.

The coloured resulting image is but the colours—red, green, and violet—of the screen as controlled or damped by the colourless positive image. The illusion (not shared by the spectroscope) of the so *variously* coloured picture is due to the limitations of our retinas and brain centres. This ingenious scientific trick has yielded some very effective work. But some obvious defects mar both the procedure and the results. I subjoin the two most prominent of these:—

(1). *Complication.*—Separate "taking" and "viewing" screens are at present requisite. Thus we have the complications of (*a*) a clumsy "taking" screen (necessarily not everywhere in optical contact with the plate), (*b*) a negative plate, (*c*) a positive printed from the negative, and (*d*) a "viewing" screen to which the positive can at best be adjusted only in imperfect register with the ruling, appropriate to its transparent portions. Obviously the familiar advertisement, *one negative one exposure*, by no means conveys any idea of these complications to the ordinary reader's mind.

(2). The separate screens involve a necessary additional evil—lack of due registration between the line records of the positive and the appropriate coloured lines on the "viewing" screen.

Note the difficulty. If (as in the case of "Joly" work I have seen and projected on to the sheet) the ruling of the screen is too coarse, detail is submerged, the lines become most offensive, and in lantern work wreck the entire picture. If, again, the ruling is too fine (and, doubtless, many will recall recently exhibited work), the registration difficulty is enhanced, and the picture, treated as a transparency, is apt to assume different colours when it is being regarded from different points of view. Now, obviously the ruling should be *as fine as the best available means will admit of.* And it is probable, so I am told, that, were the commercial demand strong and "effective," such advances would be made as would render an extremely close ruling practicable. But the present McDonough process could not benefit from these advances owing to the registration difficulty, already too formidable for accurate work. What, then, is to be done?

The improvement I am about to suggest would, if thoroughly practicable, supersede any such clumsy and complicated procedure as the "McDonough." The proposal is that glass plates (or other transparent supports) are to be ruled with the usual lines, red, green, and violet; such lines to be *as many to the inch as the utmost perfection in ruling devices shall render possible.* They are then (after the ruled surface has been duly protected by varnish or other means) coated *over the said lines* with a light-sensitive isochromatic film such as is employed for ordinary negative-making. A plate or other support so coated is exposed with its sensitive surface away from the lens or other source of light, so that the exposure is made *through the ruled lines* that underlie the said sensitive surface. The plate is then developed *as a positive* according to one of the known devices (some of which, by the way, appear to work well with very short exposures). It might also be exposed so as to ensure reversal without the aid of a special developer. Once fixed it should yield an image—if all goes well—in approximately natural colours. Copies, enlargements, and reductions on glass, paper, &c., could be made in the camera in a similar manner. Paper (made transparent) could be used as a support for *originals* as well as for copies, and so on.

Now, supposing that the above method is thoroughly practicable, we note that:—

1. Extreme simplicity of working "*one exposure, one colour picture*" would result.

2. Also perfect registration, and hence stability of colouring at all angles of view. Scope would exist for utilising the finest obtainable ruling.

The pictures, of course, would not be reversed owing to the mode of exposure, and slight flaws in the ruling would not matter at all. Detail would be excellent.

Of course an adjustable light filter on the lens hood or elsewhere (or at a pinch a film of dyed gelatine flowed over the non-sensitive side of the plate, *i.e.*, that side which is *nearest* the lens) would be requisite, and a "measured" one would be most useful, but such a filter could now be easily furnished.* No special dark slide would be wanted, and, indeed, no special apparatus whatever. The plate-maker could despatch all accessories required along with his boxes.

One word more as to the ruling. Are different colours required for the lines as regards the two operations of "taking" and "viewing" the records? Must we, for instance, accept the dicta of the "colour-curve record" theorists, such as Mr. Ives? If we must, my above described simplification obviously becomes valueless. We are told, however, that the practical three-colour worker on existing lines does not reck much of these dicta, but is content to abide, and with success, by the older positions taken up by Clerk-Maxwell and Du Hauron. The researches of Mr. Howard Farmer and his so able co-workers, are of the highest importance in this connexion, and all interested in the matter should be referred to Mr. Farmer's recent articles on the subject in this JOURNAL. The proper colours, he holds, "consist of three bands, red green, and violet respectively, whose full actions are

* An efficient mode of obtaining adequate exposures under all the three line colours would be to use on the lens a filter (such as the "Gilvus" with the spectrum plates) which cuts down the light so as to ensure correct exposures for the blue and green. In front of this filter could be *slipped* a red or orange *filter cap*, which cuts off all rays save those required for the red lines. Obviously one could expose at first with both filters in place, slipping off the red filter to complete the exposure. I have myself a most easily working arrangement of this kind on one of my cameras. One marked advantage of it is that I can fully expose for the red in ordinary work, even when using plates only dyed or "orthochromatised" so as to be specially sensitive to green and yellow.

at the extreme end of the spectrum, and in the green, they are in fact, *substantially identical with the projection colours*, and are in conformity with the teaching of Professor Clerk-Maxwell in 1862. . . . and Monsieur Louis Ducos du Hauron in 1870." Obviously a leading requirement of my "one exposure, one colour-picture" ideal is exactly met.

I have myself long hunted for good specimens of landscapes, the negatives for which were taken through colour-curve record filters and have been invariably disappointed. There is an abundance of examples of "catchy" work (fruit, fans, flowers, *objets d'art*, and the like) obtainable, but the all-important landscape and suchlike work fails entirely to satisfy. After all, mere studio reproductions of stuffed birds, vases, and fans are not what the colour-worker cares to multiply *ad infinitum*.

There are possibilities of exploiting the suggestions I have put forward in many new directions. I trust to be able to submit some of these to a trial as soon as a respite from travelling shall give me leisure wherein to make certain experiments.

February 16. E. DOUGLAS FAWCETT.

THE SOUTHSEA EXHIBITION.

THE Thirteenth Annual Exhibition of the Southsea Amateur Photographic Society has passed, and has proved equally as successful as its predecessors, and has been the means of bringing to Portsmouth a fine collection of work by the best photographers of the day, both amateur and professional. The exhibits, which numbered nearly 400, strained the holding capacity of the Society's fine rooms in Pembroke-road to the utmost, but the efforts of a good Hanging Committee surmounted all difficulties, and the pictures were disposed to the greatest advantage on the dark red baize-covered walls and screens, while the lantern slides were exhibited in special frames during the daytime and in the lantern every evening. Admission to the Exhibition was free, and interested crowds thronged the rooms from ten a.m. until ten p.m. each day. The exhibition of members' work this year was far in advance of any previous Exhibition both in quality and quantity, no doubt owing to the great influx of new members, who are also keen workers, and also to the excellent effect of last year's Exhibition. Chief amongst the new exhibitors in the Members' Classes is Mr. Louis J. Steele, who showed several delightful little pictures. His "Becalmed," which secured the silver medal in the Landscape Class, far outdistanced anything else shown in Class A. Mr. G. Wood took the second award in this class for his view of "Bonchurch," and Mr. P. R. Denham the third. Miss O. M. O'Neil secured, with her excellent study of "Trees," the special award in the Ladies' Section. Other pictures worthy of note in this class were a first-rate picture of "Hunting," by Mr. E. H. Purvis, and "A Woodland Path," by Mr. L. Dyer. In Class B the first award went to Mr. F. O. Field for a well-carried out portrait of an aggressive fox-terrier, "Bobs," which is distinctly helped by suitable framing. Mr. H. J. Hissett took the second prize for a snapshot of a rather awkwardly posed old man, and Mr. L. J. Steele was third with "The Jester." In Class C, M. G. Wood took the silver medal for a pretty little gravure print of an old porch in Cuckfield Church, very suggestive of one of Herbert Railton's charming drawings. Colonel E. Jackson took second place with a technically perfect photo taken at Bournemouth, and Mr. E. H. Purvis was third with an interesting photo of Old St. Thomas's Church, Portsmouth, in winter time. Mr. A. S. Stanford showed four excellent photos of interiors of Winchester Cathedral. Dr. Newby, the Vice-President, showed some fine architectural work, which was, unfortunately, too late for competition. Mr. H. J. Hissett's print of Exeter Cathedral Choir was spoilt by the out-of-focus appearance of the window, probably due to halation. Class D included some gems of hand-camera work by Mr. L. J. Steele, who secured the silver medal. Mr. W. G. Lewis was second with a set entitled "Types of Long Ago," and Mr. E. H. Purvis was third with another good set of six. In Class E (Enlargements), Mr. L. Dyer secured the first award for a couple of fine and very large pictures of scenes in Norway.

Mr. Purvis again scored with his picture of the training brig "Charlotte," and Mr. J. C. Prior took third place with "The Western Glacier." Captain Buckley exhibited some splendid enlargements in this class "not for competition," and Mr. J. H. Franckeis also showed good work. In the Lantern-slide Class Mr. H. A. Canning was first with a set of Norfolk Broad views, Mr. E. H. Purvis second, and Mr. J. Haseltine third.

The work of Mr. F. J. Mortimer, the late Hon. Secretary of the Society, was conspicuous by its absence from the Members' Classes this year. Mr. Mortimer's pictures have been so uniformly successful in obtaining the premier awards in both pictorial and technical sections of previous Exhibitions that this year he decided to compete in the Open Classes only. That he was quite justified in so doing was shown by the fact that he has secured two medals in the Open Classes, besides exhibiting the most admired picture of the Exhibition. The awards in the Open Classes for Landscape and Seascape were:—Silver medal, Mr. C. E. Walmsley (Ambleside), for his beautiful picture, "The Torrent," which seemed alive with action; bronze medal, "Gloria," a charming sky picture by Mr. Graystone Bird (Bath); certificate, "A Misty Morning," by Mr. W. Grist (Plymouth). Other pictures worthy of note in this class are Mr. F. J. Mortimer's "Autumn," with its graceful lines and rich colouring suggestive of fallen leaves; "An April Shower," by the same worker; "An Old Castle Gateway," by Mr. H. Quilter, which is a fine piece of good technical work; "Summer Sunshine," by Mr. S. A. Pitcher, which embodies the same idea; "Lux in Tenebris," a fine cloud and water study by Mr. Denstone Edwards; and two excellent winter photographs by Mr. J. Critchley.

In Class H the judges decided to give two sets of awards—dividing the class into portraiture and genre, the work being of such excellence. For Portraiture, Mr. A. E. Attfield's "Head of an Old Man" took the silver medal. Mr. F. J. Mortimer secured the bronze medal with a noble portrait entitled "My Age is as a Lusty Winter—Frosty but Kindly," and the certificate went to Miss Agnes Warburg (London) for "Olga." In this class Mr. F. J. Mortimer exhibited a splendid portrait study of Mr. H. T. Lilley, M.A., the President of the Society, and also other fine portrait work, mostly of celebrities known to Portsmouth. The Society has decided to purchase this picture of its President, and present it to him on his retirement from office this year.

In the Genre Section the silver medal went to Miss Agnes Tomlinson for her well-conceived and well carried out picture, "The Sick Child," Mr. F. J. Mortimer again secured the bronze medal for his picture "Washing Up," which has previously secured numerous awards elsewhere, and Mr. J. A. McMichael (Chester) took the certificate for a very similar picture entitled "Ironing Day" Mr. Graystone Bird showed a couple of his charming child studies in this class, and other pictures by Misses Tomlinson were worthy of note. Mr. F. W. Fielder's "Meadowsweet" was good, as also was "The Gleaner," by Mr. E. A. Price. Miss Bessie Eldred showed some original work, and "A Little Imp," by Mr. H. O'Klein was also good. "The Seventh Age," "The Band Passes," and "A Symphony in Black," by F. J. Mortimer were also excellent pictures.

In Class K (hand camera work), Herbert Bairstow (Halifax) took the silver medal; Mr. W. Fisher Ward (Yorkshire) the bronze, and an extra bronze medal was awarded Mr. Walter Kilbey (Surrey) for his instantaneous studies. The certificate was withheld. Mr. W. Errington Cowan showed some pretty yachting snap-shots in this class, and Mr. E. R. Collins's set was also very good, but of unequal merit.

The Lantern-slide Class was well represented, and included some very fine work. Mr. Errington Cowan secured the first place with his splendid set of flower studies, which, for good artistic and technical treatment, would be hard to beat. The bronze medal went to Mr. Graystone Bird, who scored with a well-chosen set of various subjects, and Mr. A. E. Lane, who exhibited some fine portrait work in Class H, secured the certificate with a beautiful set of portrait studies. An extra bronze was awarded Mr. Harry Wade (Manchester) for his set of splendid architectural slides.

In Class M some beautiful stereoscopic slides were shown, and the awards went to Mr. L. S. Wilks (Essex), first; Mr. R. Soper (Liverpool), second; and Mr. C. H. Oakden (E. Dulwich), third.

The Not for Competition Class was very large indeed this year, and included some fine work by well-known exhibitors.

The large stalls containing specimens of most of the latest things in apparatus and photographic sundries claimed a large share of attention during the Exhibition, and every evening at intervals of half an hour the prize and other slides were shown on the screen in the annexe. Needless to say, there was a full house on each occasion, and, on Thursday evening, when the latest films depicting every phase of the Royal Funeral from Osborne to Windsor were shown, standing room was at a premium. Altogether the Southsea Amateur Photographic Society may be congratulated on fostering the art and science of photography so successfully and unselfishly in Portsmouth and district, and it hopes to hold another and more important Exhibition on similar lines in the late autumn of this year under the guidance of Mr. F. J. Mortimer, who has been asked to again undertake the duties of Hon. Secretary.

THE EDINBURGH PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.

THE Annual Exhibition of the above Society was opened in the Club Room, 38, Castle-street, Edinburgh, on Saturday last. The Exhibition is larger in point of numbers, there being 327 entries, against 284 last year and 301 in 1899; but the Exhibition would not have suffered although the number of pictures hung had been less. Space is limited, and, with the large number of exhibits, there has been little room for any display of taste by the Hanging Committee; it has rather been a species of measured mosaic work, finding out what pictures would fit into a given space, and covering it completely, no

wall space showing, consequently one is frequently annoyed by seeing some dainty work killed by a "strong" photograph hung beside it.

The Society has in its ranks many workers of great merit, and, naturally, the members will be proud that premier honours have been secured by members.

The principal classes are two "Open to All," and here Mr. James Patrick has rivalled his success of the last two years by winning at the present show both gold medals. Mr. Patrick has been for long a well-known and popular photographer, working on legitimate lines, and free from any of the eccentricities that do so much to mar the work of many "leading" workers. His work is an object-lesson that success is not necessarily bound up with the production of something outré or an entire disregard of technique. Mr. Patrick's photographs are, like many great inventions, striking in their simplicity. We heard the remark at Edinburgh from a very evident novice, criticising one of the gold medal pictures, "Why, I could have done as good as that myself." Yes, probably, but the Spanish courtiers knew how to make an egg stand on end when Columbus showed them how, yet they did not discover America. But that is a digression.

In Class I. (open to all), Portraiture and Figure Studies, there are 72 entries, and the gold medal is awarded to Mr. James Patrick for "The Evening of Life." This is an open-air portrait of an old woman with a "wee" bundle of faggots; the sky particularly helps in carrying the title, the whole picture being in thorough sympathy. If we were to be critical, we might say that the slight inclination of the figure to one side, and the repetition of this inclination in the posts in the background, gave the picture a "falling-over" effect. We might also suggest that the "something," probably a bit of fence or an outhouse on the right of the picture is obtrusive, and would be better wanting; but that verges on the supercritical. Mr. Alex. Allan, Edinburgh, gains the silver medal with "Sunlight," a figure standing in a doorway framed in sunlight, reminding one of a picture shown at the R. P. S. a year or two ago. The sunlight, however, is well rendered, and it shows that Mr. Allan is not absolutely confined to old people for his models. The bronze medal is awarded to "Meditation," by Mr. R. G. Scott, Glasgow, a pleasing study of a little girl meditating. The hands might be improved in pose, and the mouth is perhaps more peevish than meditative. Mr. John M. Whitehead, Alloa, has some of his well-known flower and fruit studies in this class. No. 72 is a picture that is completely overshadowed by a magnificent frame in wood and copper work, it is really worth inspection.

The gold medal in Class II. (open to all), Landscape and Seascape, also goes to Mr. Patrick, his subject being "A Shepherd's Cave," and again has he gone to his beloved Swanston, as in 1899, and also he has again employed sheep in his foreground—a favourite method, effectively employed, by this worker. The trees in the distance seem rather harsh in their outline, but the picture hangs well together, and depicts a beautiful country scene. The silver medal is gained by Mr. Graystone Bird, Bath, with "Joe's Ship." This represents a girl on the sand dimes gazing seawards to where a ship rides the ocean; it is easy to fill in the story, but the picture is hard, hard in its rendering. The bronze medal is awarded to Mr. John M. Whitehead, Alloa, "The Path in the Wood," a skilful treatment of the play of sunlight on a woodland scene. Mr. W. J. Croall is certificated for "On the Sand Dunes," a poetic treatment of a very ordinary subject that might have well, we think, obtained a higher award. A certificate is also gained by "Harvest Time," by Mr. W. B. Mercier, Perth, a complete and pleasing picture.

In Class III. (open to members), Portraiture and Figure Studies, the ladies made a hit, and justified the abolition of the class specially reserved for lady members that was departed from here two or three years ago. Miss C. H. Curle, who might be advantageously more prominent at our exhibitions, took first place with a "life-ey" study, "Ringing a Wheel." The man is really working, and the rising steam aids considerably in the making of the picture. Miss Eleanor M. Grey is second with a "Portrait Study," very similar to one shown by this lady last year, good in tone, but there is an unpleasing expression on the face of the model. A certificate is gained by Alex. McNab, for, "With Thought O'ercast," an effective "large" study of an old man's head.

Class IV. (open to members), Landscape and Seascape.—Here, in spite of an awful frame, "Towing," by Robert B. Penman, takes first place. The smoke from the tug, and the sea, are well rendered, but even Turner would have hardly dared to paint such a sky, and he was believed to know almost everything in that line. Robert Gordon gains second place with "A Southern Village." Good honest work, pleasing picture of a quiet country hamlet.

The class for those who have never won a prize contains much good work, mingled with much that would have been better unhung, although it may be a means of encouraging young members.

In the Lantern-slide Class the judges have declined to give any awards, the quality of the exhibits not equalling the standard they have set.

The Exhibition will remain open until March 9; on March 2 a lantern lecture on "A Holiday in Spitzbergen" will be given by Mr. H. Stewart Wallace, W.S.; and on March 9 Mr. Hugh Auld, W.S., will lecture on "A Sightseer in Egypt," illustrated with lantern slides.

The following is the full prize list:—

Class I. (open to all), Portraiture and Figure Studies.—Gold medal, James Patrick, Edinburgh, "The Evening of Life" (33); silver medal, Alex. Allan, Edinburgh, "Sunlight" (3); bronze medal, R. G. Scott, Glasgow, "Meditation" (59).

Class II. (open to all), Landscape and Seascape.—Gold medal, James Patrick, Edinburgh, "A Shepherd's Cave" (90); silver medal, Graystone Bird, Bath, "Joe's Ship" (96); bronze medal, J. M. Whitehead, Alloa, "The Path in the Wood" (89); certificates, W. J. Croall, Edinburgh, "On the Sand Dunes" (80), and W. B. Mercier, Perth, "Harvest Time" (84).

Class III. (open to members), Portraiture and Figure Studies.—Silver medal, Miss C. H. Curle, "Ringing a Wheel" (153); bronze medal, Miss E. M. Grey, "Portrait Study" (138); certificate, Alex. McNab, "With Thought O'ercast" (168).

Class IV. (open to members), Landscape and Seascape.—Silver medal, R. B. Penman, "Towing" (204); bronze medal, Robert Gordon, "A Southern Village" (196).

Class V. (Open to amateur members who have never received an award at any Exhibition), Any subject.—Bronze medals, George A. Hall, "Mending his Nets" (251), and E. M. Horsburgh, "But Winter lingering chills the Lap of May" (268).

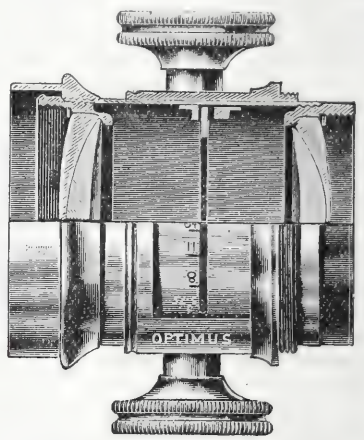
Class VI. (open to members), Lantern Slides in sets of three.—No awards.

Our Editorial Table.

The "Grossar" Lens for Enlarging, &c.

Manufactured and Sold by Perken, Son, and Co., Ltd., 99, Hatton-garden, E.C.

This lens is a special introduction by Messrs. Perken, Son, and Co., Ltd., whose apparatus bearing the "Optimus" trade-mark is known to every photographer. It is an instrument expressly designed for the enlarging lantern, and combines fine definition with great rapidity and flatness of field. The series consists of three sizes of 7, 10½, and 15 inches focus for use respectively with condensers 5 to 6, 7 to 8, and 9 to 10 inches in diameter. The intensity of the lens at full aperture



is f-5.75. It will be seen from the illustration that the lens is of the rectilinear class, a type which has earned a deservedly high reputation for freedom from spherical aberration. A rack-and-pinion movement is provided for fine adjustment of the focus, and the iris diaphragm, with which the lens is fitted, will be a welcome substitute for the old Waterhouse stops. A focussing cap of orange glass is also provided. The tests to which we submitted the 10½ inch lens placed at our disposal gave most satisfactory results, and we think the instrument should not only be of great value to the enlarger, but also to the lanternist.

Suter's Anastigmatic Lenses.

Manufactured and Sold by E. Suter, Basle.

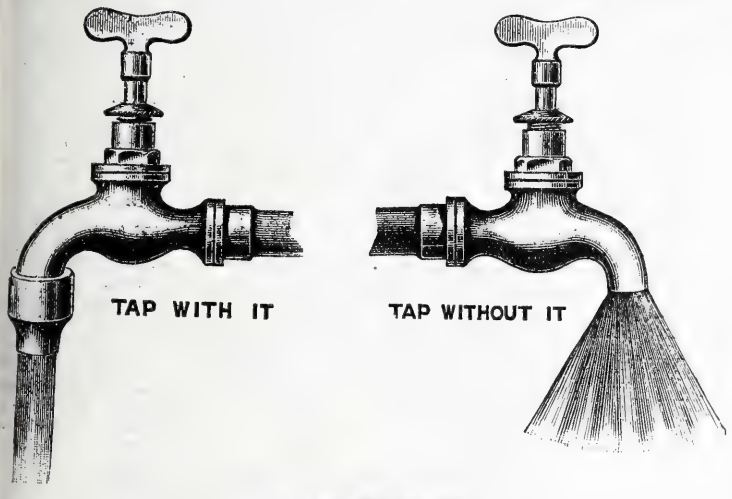
Mr. J. R. Gotz, of 215 Shaftesbury-avenue, has submitted for our inspection three specimens of a new anastigmatic lens recently constructed by the well-known optician, Mr. E. Suter, of Basle. The type is known as Series I., and, to some extent, resembles in its construction the well-known double anastigmat of C. P. Goerz. However, in this lens each combination is composed of four elements. No particulars of the glass used are given in the prospectus beyond the fact that the four elements are of different kinds. To convey an idea of the construction of the lens, we would mention that the double concave middle element of the Goerz type appears to be replaced in the Suter anastigmat by a negative meniscus and a crossed double concave. We thus have in the construction of the combination an outer double convex, followed by a negative meniscus, a crossed double concave with

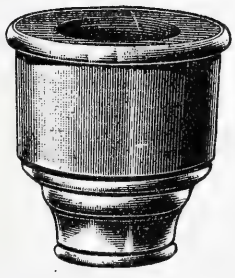
the flatter curve in front, and, lastly, a positive meniscus. The three lenses submitted to us are Nos. 2, 3, and 4 of the series, their respective foci being 175, 205, and 270 mm. The quality of definition is of a high order, and the flatness of field excellent. The lens of 175 mm. (6¾ in.) covers a 7×5 in. plate well at full aperture, whilst with smaller stops it may be used for plates up to 9×7 in. The next size of 205 mm. (8 1-16 in) focus, covers plates from 8×6 in. to 12×10 in., according to aperture, and the lens of 270 mm. (10⅝ in.) focus is designed for plates 9×7 in., and, with small stops, will cover 15×12 in. According to the maker's description, these lenses have an aperture of f-7.2, but we found No. 2 not quite of this intensity. The rapidity of these lenses, their flatness of field, and wide angle of covering power should make them favourites with photographers for most purposes. Mr. Gotz is the London agent.

A Tap Filter.

Manufactured and sold by the Torton Manufacturing Company, Wigan.

This is a little dark room convenience to the utility of which we can testify from practical trial. The fitting is lined with rubber so that it is easily attached to the tap; inside there is a finely perforated gauze disc, which so regulates the down flow of water, that it reaches the





dish or measure in a solid stream without splashing. Of course, it also acts as a filter for the coarser impurities the water may contain. The free easy flow is a thing we have much appreciated in sink work in the dark room, and we can thus recommend the filter to our readers who desire to make the operations of developing, washing, &c., as cleanly and comfortable as possible.

The Biograph in Battle.

By W. K. L. Dickson. 296 pp., illustrated, price 6s.
London: T. Fisher Unwin, 11, Paternoster-buildings, E.C.

Mr. Dickson passed several months in South Africa during the earlier stages of the present war, and the book before us is an illustrated record of his experiences as a photographer commissioned to secure negatives of such incidents of the campaign as would prove of popular interest. The text of the volume is in diary form. Mr. Dickson appears to have sent home daily details of his experiences, and to have set down on paper perfectly frank impressions of what he saw and heard. The result is a readable narrative of events seen through the eyes of the adventurous journalist in search of copy. Mr. Dickson betrays his American nationality on every page, but his sympathies are avowedly British. We can forgive him a somewhat excessive use of the first person singular, as he manifested great dash, bravery, and resource at times, and all through the piece was extremely smart in extracting valuable photographic permits and concessions from those very stubborn persons, the military officials. Mr. Dickson went through the terrible experiences of Ladysmith; but his book here and there shows that he had several good times with Mr. Rhodes and other important persons. On one occasion he sat at lunch between the South African Colossus and Lady Edward Cecil. And so on. The book from the point of view of literality might have been improved by a little more careful revision. No such persons as "Lord Lovel Roberts," "Lord Bryan Leighton," or "Lord Rawlinson," took part in the campaign. Again, we do not usually speak or write of "an" hospital; and "Johannisburg" is not spelt that way. We draw attention to these typographical disfigurements so that when he puts his next book in hand, Mr. Dickson may be induced to submit his proof sheets to an English reader who will save him from mistakes into which French and American writers are peculiarly liable to fall. In all other respects the book is capitally done, and the ninety odd photographs reproduced, bring home to us with a vividness that only the lens and the dry plate can command, the horrors, the humours, the pathos, and humdrum incidents of this long-drawn-out war. At page 177 there is a picture of a horse in Ladysmith during the siege. The animal is a mere bag of bones! We thank Mr. Dickson for a book which is fresh and ingenuous, and bears the stamp of cool accuracy of observation unclouded by the insincere gush of the imaginative "special," a class of writer of whom the public has had too much during the war.

Studio Gossip.

The Closest Approach to Daylight.—M. Tesla is credited by an American contemporary with the following statement: "This light is the result of continuous efforts since my early experimental demonstrations before scientific societies here and abroad. In order to make it suitable for commercial use, I had to overcome great difficulties. One of these was to produce from ordinary currents of supply electrical oscillations of enormous rapidity in a simple and economical manner. This, I am glad to say, I have now accomplished, and the results show that with this new form of light a higher economy is practicable than with the present illuminants. The light offers, besides, many specific advantages, not the least of which is found in its hygienic properties. It is, I believe, the closest approach to daylight which has yet been reached from any artificial source. The lamps are glass tubes which may be bent in any ornamental way. I most generally use a rectangular spiral, containing about twenty to twenty-five feet of tubing making some twelve to fourteen convolutions. The total illuminating surface of a lamp is from 300 to 400 square inches. The ends of the spiral tube are covered with a metallic coating, and provided with hooks for hanging the lamp on the terminals of the source of oscillations. The tube contains gases rarefied to a certain degree, determined in the course of long experimentation as being conducive to the best results. The process of light production is, according to my views, as follows: The street current is passed through a machine which is an electrical oscillator of peculiar construction and transforms the supply current, be it direct or alternating, into electrical oscillations of a very high frequency. These oscillations, coming to the metallically-coated ends of the glass tube, produce in the interior corresponding electrical oscillations, which set the molecules and atoms of the enclosed rarefied gases into violent commotion, causing them to vibrate at enormous rates and emit those radiations which we know as light. The gases are not rendered incandescent in the ordinary sense, for, if it were so, they would be hot, like an incandescent filament. As a matter of fact, there is very little heat noticeable, which speaks well for the economy of the light, since all heat would be loss. I have found that in almost all its actions the light produces the same effects as sunlight, and this makes me hopeful that its introduction into dwellings will have the effect of improving, in a measure now impossible to estimate, the hygienic conditions. Since sunlight is a very powerful curative agent, and since this light makes it possible to have sunlight, so to speak, of any desired intensity, day and night, in our homes, it stands to reason that the development of germs will be checked and many diseases, as consumption, for instance, successfully combated by continually exposing the patients to the rays of these lamps. I have ascertained unmistakably that the light produces a soothing action on the nerves, which I attribute to the effect which it has upon the retina of the eye. It also improves vision, just exactly as the sunlight, and it ozonises slightly the atmosphere. These effects can be regulated at will. For instance, in hospitals, where such a light is of paramount importance, lamps may be designed which will produce just that quantity of ozone which the physician may desire for the purification of the atmosphere, or, if necessary, the ozone production can be stopped altogether."

American Copyright Law and Practice.—Recently before the Photographic Society of Philadelphia, Mr. George Vaux, junr., read a paper on "American Photographic Copyright." The appended extract will show, in brief, the essential difference in the point of view taken by the American judges on this question as compared with the English practice. According to the former no copyright can exist in a photograph of nature: "Prior to 1865, printed pictures were referred to as 'prints, cuts, and engravings,' and it was held that these words did not include photographs. This defect was cured by the act of March 3, 1865, which specifically made photographic prints and negatives the subject of copyright. But the question was raised in a case in which a photograph by Sarony had been pirated, whether the Act of 1865 did not overstep the limits of the constitutional provision, it being urged that the maker of photograph was neither an author nor an inventor within the meaning of the constitution. It was urged that a photograph was the result of the operation of natural laws and not the embodiment of an intellectual conception. That, while the effect of light on a sensitive plate might have been a discovery in the production of pictures for which patents might have been obtained, the results were merely mechanical, with no

place for originality, novelty or invention. In commenting on this contention, Mr. Justice Miller, of the Supreme Court of the United States, says, 'This may be true in regard to the ordinary production of a photograph, and in such case a copyright is no protection. On the question thus stated we decide nothing.' After referring to the fact that an application for a patent is most carefully scrutinised before the patent may be issued, whilst a copyright is issued as a matter of course, the Court continues, 'It is, therefore, made more important that when the supposed author sues for a violation of his copyright the existence of those facts of originality, of intellectual production, of thought and conception on the part of the author should be proved, than in the case of a patent right. In the case before us we think this has been done. The third finding of facts says in regard to the photograph in question that it is "a useful, new, harmonious, characteristic, and graceful picture, and that the plaintiff made the same entirely from his own original mental conception, to which he gave visible form by posing the said customer in front of the camera, selecting and arranging the costume, draperies, and other various accessories in said photograph, arranging the subject so as to present graceful outlines, arranging and disposing of the light and shade, suggesting and evoking the desired expression, and from such disposition, arrangement, or representation, made entirely by plaintiff, he produced the picture in suit." These findings, we think, show this photograph to be an original work of art, the product of plaintiff's intellectual invention, of which plaintiff is the author, and of a class of inventions for which the Constitution intended that Congress should secure to him the exclusive right to use, publish, and sell, as it has done by Section 4952 of the Revised Statutes.' It would seem that any one who had done all the Court said was accomplished in this case by way of evolving mental conceptions, and then giving them visible, useful, new, harmonious, characteristic, graceful and original form, posing, arranging, disposing, suggesting, and evoking, withal, should have had something to protect him from the machinations of a grasping, but, perhaps, not over original, rival. The words might equally well apply to some of the examples of the 'new photography,' which resembles nothing heretofore known to the mind of man. It is evident from the foregoing opinion of Justice Miller that, whilst photographs may properly be the subject of copyright, it does not follow that any and all photographs are. An attempt has been made to put so broad an interpretation upon it, but the endeavour to enforce this strained construction has very properly failed, though not until numerous most exasperating suits had been brought, many of them savouring very strongly of blackmail. Among the more recent judicial deliverances on the subject were those of about a year since, both in the United States Circuit Courts, one in Denver, Colorado, and the other in New York city. In the latter case, the copyright of a photograph of an actress was held to be invalid. The former involved a broader question—that of what privileges can be obtained by copyrighting a photograph of natural scenery. The Detroit Photograph Company, the proprietor of the well-known views taken by Mr. W. H. Jackson, endeavoured to restrain Frank S. Thayer, a Denver bookseller, from selling in a work, called 'Colorado in Colour and Song,' a copy of one of Jackson's coloured photographs. 'The Palisades and Alpine Pass.' The issue which was flatly raised was as to the propriety of allowing any photograph of natural scenery, even though coloured, to be copyrighted. Judge Hallett thus summed up the law of the case, 'A photograph of natural scenery is not the subject of copyright, because it is not an original conception of the artist. It is merely a skilful manipulation of the camera. Further, it is not shown that there was any originality about the colouring of the photograph in question, and it was shown by the defence that the result achieved was old and in common practice.' The distinction between this and Sarony's case is very clearly drawn. Jackson's contentions did not bring him within the rule there laid down. Whichever view of the Denver case may be taken, there appear to be hardships. If a man goes to great trouble and expense to organize an expedition, endures hardships and dangers for the purpose of obtaining photographs of some great natural objects, theretofore unknown, it would appear that some method ought to be provided by which he can secure protection from some one who desires to avail himself of the labours of another without paying for them—clearly a most immoral procedure. But, on the other hand, nature is free to all, and that the first taker of a view which every one may duplicate should gain any proprietary right therein appears to be an equal hardship. The correct rule is clearly shown by the foregoing cases—it is the original thought, the nascent conception, to which the right of ownership is secured by law. The actual result has but little to do with it. This is but carrying out the general principles applicable to literary productions. a copy doesn't go. Originality alone is the crucial test."

News and Notes.

South London Photographic Society.—Entry forms for the Exhibition will be received up to Saturday next, February 23.

Royal Photographic Society.—Technical Meeting, Tuesday, February 26, at 66, Russell-square, at eight p.m. "Notes from five years' work with X rays," by Mr. William Webster.

The Warnerke Fund.—In addition to the amounts for this Fund in the Ex Cathedrâ on our first page, we have received the sum of 5s. from Mr. Morgan Wright, Photographer, of 75, Albert-road, Middlesborough.

The Exhibition of the Photographic Section of the G.E.R. Mechanics Institution, Stratford, E. will be held on March 26 and 27.—In the open class one silver and two bronze medals will be offered. The names of the Judges will be announced later.

We have received a copy of the Jubilee Number of the "Christchurch (N.Z.) Weekly Press," illustrating and describing fifty years' progress in Canterbury, consisting of 100 pages, and containing scores of illustrations. This Jubilee number constitutes a magnificent piece of historical work.

The Fifth Annual Dinner of the South London Photographic Society was held on Saturday, February 16, at Anderton's Hotel. Mr. Charles H. Oakden, F.R.P.S., was in the chair, and some sixty or seventy gentlemen attended. After a short toast list, the remainder of the evening was passed in song and recitation.

The Leicester and Leicestershire Photographic Society's Annual Exhibition will be held on March 19 to 22, 1901. There will be open classes for prints and lantern-slides in which silver gilt, silver and bronze medals are offered. Entries close March 13. The judges are Messrs. J. B. B. Wellington and Percy Lund. Entry forms and full particulars may be obtained from the Hon. Secs., E. W. Bush, 19, Equity-road, H. Walker, Glen Burn, Ashleigh-road, Leicester.

A Photographic Society for Tewkesbury.—A meeting was held in the Wesleyan Lecture Hall on Tuesday, February 12, of the Photographic Club of the Wesley Guild, and of those interested in photography. Amongst those present were Rev. G. Beebee, Messrs. W. J. Gardner, G. C. Gardner, Ridler, Bannister, Morse, Boughton, Willis, Gregory, Stroud, and others. It was decided to form a society to be called the "Tewkesbury Photographic Society," for the encouragement of photography as a hobby. Rev. G. Beebee was elected President, Mr. J. J. Price, Hon. Secretary, pro tem. ; and Mr. Gardner, Hon. Treasurer ; the Committee to consist of the officers, and three of the members chosen by themselves annually—Messrs. Ridler, Bannister, and Stroud being elected for the first year. It was decided to hold the next meeting in the Science Hall, if the room can be obtained from the committee for this purpose, at a date to be decided on subsequently.

The Longton Exhibition.—The following is the list of the Judges' awards at this Exhibition :—Class A.—First prize (silver medal), H. A. Jackson, "The Old Locksmith ;" second prize (bronze medal), Rev. C. F. L. Barnwell, "The Model Maker." Class B.—First prize (silver medal), J. Owen Price, "When the Tide is Low ;" second prize (bronze medal), W. T. Lucas, "Departing Day." Class C.—First prize (silver medal), Rev. C. F. L. Barnwell, "In Chichester Cathedral ;" second prize (bronze medal, H. A. Jackson, "The Sentinels." Class D.—First prize (silver medal), G. V. Myatt, "A Sunny Street ;" second prize (bronze medal), T. Mottishead, "A Winter's Day." Class E.—First prize (silver medal), T. W. Hawkesworth, "The Edge of the Common ;" second prize (bronze medal), G. V. Myatt, "Where Sea Meets Land." Class G.—First prize (silver medal), Rev. C. F. L. Barnwell, "Yachting Studies;" second prize (bronze medal), T. W. Hawkesworth, "Silver Ripples." Class H.—Second prize, W. T. Lucas, "In the Dell." Class J.—First prize (gold medal), Francis A. Bolton, F.R.P.S., "Looking Westward," second prize (bronze medal), J. M. Whitehead, "Apples, Grapes, and Oranges." Class K.—First prize (silver medal), Francis A. Bolton, F.R.P.S., "A December Morning ;" second prize (bronze medal), J. C. Lee, "Evening" (a landscape). Class L.—First prize (silver medal), Wm. McLean, "Minding Baby ;" second prize (bronze medal), Graystone Bird, "The Hour of Rest," W. A. Taylor, "Tideswell Church."

Commercial & Legal Intelligence.

The Sanderson Cameras.—Messrs. George Houghton and Son, of 88 and 89, High Holborn, W.C. write : "We have pleasure in handing you herewith a copy of our newly published booklet of the Sanderson Hand Cameras. You will notice that we again quote prices for this camera in all sizes fitted with Busch, Dallmeyer, Goerz, and Cooke lenses, are now supplying same in the Continental sizes of 9 by 12 and 13 by 18 ctrs., and also 7 by 5 inches. We have also introduced a Tele-photo lens, which can be fitted to the ordinary Unicum lens and shutter supplied with the camera. We are also this season fitting the cameras with a shoulder strap, and also with infinity catches, these latter enable the camera to be opened immediately ready for snap-shot work, without making use of the rack-and-pinion focussing arrangement."

Are Sciagraphs Evidence ?—Photographs taken by the Röntgen rays are, as every one knows, of immense value to surgeons, but can they be received as evidence in a court of law ? This question arrives from the fact that in a case of shooting with which a prisoner was charged at Clerkenwell Police Court, one day last week, the doctor put in a photograph taken by the X rays, showing the injury done by the bullet. The magistrate, Mr. Bros, said he did not know whether the photograph could be accepted as evidence. He remarked, however, that it was very useful and might be produced at the trial. We do know that similar photographs have been shown at different times in courts of law, and we have no recollection of their ever being rejected as evidence. Perhaps, however, there may be a difference between what is accepted in civil cases, and what may be admissible in criminal ones.

The Kodak War Pictures Exhibition, which was so successful at Brompton-road, London, has been transferred to the Liverpool branch, 96, Bold-street, and will remain open to the public (by visiting card) from February 23 to March 21. This unique collection has been selected from pictures taken by Mr. H. C. Shelley (War Correspondent of "The King", and the "Westminster Gazette"), Captain Archibald, U.S.A., Lady Sarah Wilson, Lieutenant and Adjutant Matheson, Dan Albone, Esq., officers and others at the seat of war in South Africa. We understand the large

number of bromide enlargements has been further enriched by the addition of fifty others. We would recommend our numerous friends in the north not to miss the opportunity of viewing these photographic records of the actual warfare, which must be of the greatest interest, not only to photographers, but to all who are in the least conversant with the various phases of the war in South Africa. We understand Mr. Davison (Managing Director of Kodak, Limited) will be present at the opening.

Litigation about a Photograph.—Mr. Hy. Andrade, of 64, Faversham-road, Catford, sued Mr. John Corlett, the proprietor of the "Sporting Times" (commonly known as "The Pink 'Un"), of 52, Fleet-street, E.C., at the City of London Court, before Mr. Commissioner Kerr, on Thursday last, to recover the sum of £3 16s. 6d., in respect of a photograph that had been damaged. It appeared that the photograph had been sent to the defendant in order that he might take a copy from it. The plaintiff maintained that it had been damaged by ink spots. The defendant was quite sure the spots could be taken out if the plaintiff would let him have the photograph to operate upon, and at a previous court the learned Commissioner agreed to allow the defendant that opportunity. The defendant now stated that the photograph could not be restored. His Honour said that under those circumstances, he thought that unless the parties could come to terms a jury would have to fix the amount of damage to which plaintiff was entitled. He did not much care about sending such a case before a jury, because they generally added the amount offered by the defendant to the sum wanted by the plaintiff, and divided the total by two—a process that he considered was only worthy of a little schoolboy. The action was accordingly adjourned for trial before a jury unless, in the mean time, the parties came to terms.

The Austin-Edwards Monthly Competitions.—The following is the list of awards in these Lantern-slide and Film Negative Competitions for the current month: Lantern-slide Competition: £3 cash prize, R. W. Dugdale, Gloucester, "Series of Interiors, Gloucester Cathedral;" £2 cash prize, A. H. Robinson, Scalby, R.S.O., "A Drifted Road;" £1 cash prizes, J. J. Hartley, Colne, "Winter's Snowy Garb;" V. C. Baird, Broughty Ferry, N.B., "Library Staircase, Rouen Cathedral;" H. W. Rush, Tunbridge Wells, "When the Acorns Fall;" H. P. Hopkins, Stoke-on-Trent, "A Snap-shot on Scarboro' Sands;" C. A. Courtney, Tunbridge Wells, "Little Girl Painting." Film Negative Competition: The Frena camera, given each month for the best negative on an Austin-Edwards film, has been secured by W. B. Funnell, Newick, for his negative, "A Snow Scene." The film (Setoloid) on which this negative is taken was four years old, and the packet had been opened over three years. Mr. Funnell writes to Mr. Edwards as follows: "On Tuesday, the 8th inst., I took a photograph of a snow scene on a film I purchased from you in 1897. . . . . It speaks wonders for the excellent keeping qualities of your films, as the packet was opened three years and seven months ago, and the films are still perfect."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
25.....	Aberdeen	Demonstration: *Velox Paper*. A. Nightingale.
25.....	Bradford Photo. Society	*Wensleydale, with Cycle and Camera*. G. Thistlethwaite.
25	Camera Club	*Musical Evening with Phonograph*. R. M. Cocks.
25..	Doncaster	*Hand-camera Work from Start to Finish*. A. Horsley Hinton.
26.....	Aintree	Demonstration. F. Anyon.
26.....	Birmingham Photo. Society ...	Annual Exhibition.
26.....	Newcastle-on-Tyne	*A Few Notes on some Early Photographic Portraits*. W. S. Corder, J.P.
27	Borough Polytechnic	*The Camera in the Field*. G. T. Harris, F.R.P.S.
27.....	G.E.R. Mechanics Institution...	Lantern Show by Members of Walthamstow Photographic Society.
28.....	Ashton-under-Lyne	Exhibition of Members' Slides.
28.....	Camera Club	*Indian Eldorados*. Dr. J. W. Evans.
28.....	Darwen	Demonstration: *Enlarging*. George Latimer.
28	Hull	Exhibition of Members' Slides.
28.....	Liverpool Amateur	*Across Italy*. James Shaw.
28.....	London and Provincial	Annual Supper.
28...	Oldham	*Norwegian Pictures*. J. Chadwick.
28-Mar. 2	Woolwich Photo. Society	Annual Exhibition.
March.		
1.....	Aberdeen	*City Contrasts*. A. M'Killigan.

ROYAL PHOTOGRAPHIC SOCIETY.

Feb. 19,—Technical Meeting,—Mr. W. Thomas in the chair.

Mr. W. Edwin Tindall, R.B.A., read a paper, entitled "Imitative versus Creative—a Comparison," in which he set forth some of the principles to be taken into consideration in the production of a work of art, and the idea dominating its production, applying them afterwards to photography, the particular class of work engaged in by his audience. He emphasised the importance of having an ideal, if noble and lofty, for the reaching of a high standard. A work of art must have in it the power of personal expression. There is a prevalent belief that the imitation of nature is the aim of an artist. By imitation is meant copying without choice and judgment, and it is a question as to how far mere imitation of nature may result in a work of art. However skilfully done, it is but the ground work of ideal art. The gifted man of genius by it gives form to his imagination, but, if the story told on canvas or paper is too matter-of-fact and fails to excite the imagination of the spectator, it fails as a work of art. There is more in art than the power to make a skilful facsimile which, while faithfully rendering the letter, misses the spirit of the thing. A study of nature should be accompanied by a study of the works of the great masters, not by imitation but by looking into his method of studying. The best work is characterised by simplicity and absence of pretence, and is made up of form, tone, colour, and composition. The first three may be gained by the study of nature, but the latter involves the harmonious combination or arrangement of such three, either separately or together. In photography it must be of form and tone. Tone is the most important study for a black and white man—it is the most subtle, complicated, and comprehensive. There is a wrong idea amongst photographers that the closer their work imitates nature the better their work in the art sense. But the true object of art is to create a world, not to imitate it. There is too much of the beg and borrow principle which is not calculated to develop individuality. Freedom from the tendencies to imitate opens up a very wide field. Give to your work some part of yourself and you will get something interesting. There is a tendency nowadays to disclaim as much as possible the mechanical assistance derived from the camera amongst those aiming to produce pictorial results, and to ask credit for "faking" and "control," although under the name of photography. Faking, however, can advance photography nothing as photography. If faking be necessary to produce a picture, it is only necessary to advance faking so far, that camera and lens may be discarded altogether, and your negatives made on a piece of paper or glass. Photography, as a separate means of expression, cannot greatly benefit by handwork. Mr. Tindall then criticised some of the works hung at the New Gallery Exhibition last autumn, afterwards showing upon the screen a large number of lantern-slide reproductions of well-known pictures, classified as creative and imaginative, with special allusion to their composition and the points which decided the class to which they belonged. Mr. Tindall's lecture is one that cannot fail to interest all striving to impart pictorial qualities to their photographic work, and we refer them to the full text of the lecture which will appear in due course in the Society's "Journal." A discussion ensued, Mr. F. C. Lambert making some running comments upon several interesting points. Mr. Tindall replied to a few queries and to a hearty vote of thanks that was accorded to him for his lecture, and his second journey to deliver it.

PHOTOGRAPHIC CLUB.

February 13,—Mr. H. P. Smith in the chair.

A discussion took place upon a question whether the addition of a single lens, as a magnifier, to a rapid rectilinear lens impaired its quality or interfered with the coincidence of the chemical and visual foci.

Mr. F. A. Bridge said he had tried these supplementary lenses, but found that it was very difficult to get really sharp pictures at the distances specified by the makers. He believed it to be a safe plan that the square of the focus of a lens in inches, taken as feet, expressed the distance at and beyond which all planes were practically at one focus. For instance, with a five-inch lens, twenty-five feet and beyond would always be in focus.

Mr. Hans Muller criticised the performances of the so-called "magnifiers" referred to in the question, and expressed his conviction that their capabilities were grossly over-rated for the distances at which they were supposed to produce sharp images.

Mr. E. W. Foxlee referred to a lens that was brought out by Morrison, the front of which was an achromatic lens and the back a single glass. The focus of the compound could be altered by changing the single glasses. He had one of these lenses, but not with the supplementary lenses.

Mr. Bridge considered that, as a general rule, lenses like those under discussion, were in the same category as most universal things, doing most things badly and very little well. He had, however, seen some very good work by Mr. Dugdale, who had a series of lenses properly worked out with a view to interchange in this way.

Mr. Foxlee added that he was in possession of a casket of Darlot lenses, which were very complete and useful. There were fourteen separate lenses and a portrait lens as well, giving combinations varying in the foci from 1¾ inches up to 9 or 10 inches.

North Middlesex Photographic Society.—February 18, Mr. A. H. Lisett in the chair.—About fifty members and friends were present to hear Mr. Child Bayley lecture on "Hand Cameras." The subject was dealt with in an elementary manner, the lecturer taking as his text the cameras brought by the members for the purpose. At the conclusion of the meeting a shutter testing apparatus was put in action, and those whose cameras were loaded were able to ascertain the speed of their shutters merely by taking a snap-shot of the illuminated disc, in front a circular perforated screen was whirled at a known rate by a small electric motor.

Croydon Camera Club.—The Annual Meeting held on Wednesday, February 13, indicated that there has in the past year been no slackening in the vigour and energy of the Club, and no loosening of the admirable esprit de corps and good fellowship which has always had such a large influence in promoting the welfare of the Society. The annual report, as read by the President, showed that twenty-eight evening meetings had been held, at which the attendance of members (as shown by the signature book) averaged twenty-four per meeting. The excursions were also well attended, the largest number of members and friends being fifty-four (which was when the Thames trip, organized by Mr. Ben. E. Edwards, was undertaken). The report, with some justifiable pride,

glanced at the result of the Khaki Lantern Show, which enabled the sum of £82 15s. to be handed over to the funds on behalf of our soldiers at the front. Both the accession of new members and the balance-sheet and accounts showed a satisfactory result. A cash balance of some £30 was in the bank, while the assets showed that, after deducting liabilities (two small accounts rendered too late to be paid within the year), there is a value of over £80 in favour of the Club. The reappointments were as follow :—The President, Mr. Hector Maclean, F.R.P.S., was re-elected, as also were all the members of the late Council except Messrs. Packham and Wilcocks, who did not stand for re-election. Their places were filled by Messrs. Hicks and Rogers. All present heard, with much regret, that Mr. Rogers felt obliged, by business considerations, to resign the secretaryship of the Club, and the meeting very heartily and spontaneously endorsed the President's words offering the members' and the Club's appreciation and thanks for the bright and successful management of the secretarial duties pertaining to the Club, which Mr. Rogers had performed with such satisfaction to all members. On the motion of Mr. W. H. Smith, seconded by Mr. S. H. Wratten, and carried amidst loud applause, Mr. A. E. Salt, 76, Heathfield-road, was appointed Hon. Secretary for the coming year.

G.E.R. Mechanics Institution (Photographic Section).—February 13.—Mr. Bynoe delivered a lecture, entitled "Photographic Facts, Interesting and Amusing," and the lecture fully bore out the title. The mechanical slides were much commented on, especially those illustrating the undulation of the light waves, the "Frena" changing gear, and the principle of the tele-photo attachment, as they illustrated the respective points of the lecture in a very clear, instructive, and yet popular manner. Mr. Bynoe also threw on the screen a large number of excellent diagrammatic and pictorial slides, showing the advantages to be obtained by using a good lens, and a swing-back camera. The pictures illustrating the "Beginners' Blunders," were not only very amusing, being accompanied as they were, by Mr. Bynoe's comments, but, they became of value to beginners in the photographic field, as showing them what to avoid and how to avoid it. Messrs. Beck had also sent down several portfolios of excellent pictures taken on their films, also a large assortment of cameras and apparatus, the working of which was fully and clearly explained.

Liverpool Amateur Photographic Association.—Dr. Llew. Morgan (President) presided over a large attendance of members and friends of this Association on Thursday evening, February 14, when a most interesting lecture was given by Mr. F. Gregory Jones, entitled "Round the World viâ Australasia." The route was by way of the Mediterranean and Egypt, visiting the Pyramids, Cairo, and Khartoum, thence viâ Aden and Colombo to Western Australia, Ballarat, Adelaide, Melbourne, and Sydney." The tour also embraced Tasmania, New Zealand, and New York. The lecture was most instructive, and the interest of the audience was sustained from start to finish. The slides were of the highest order, and included a number of capital cloud effects.

Leicester Literary and Philosophical Society (Section G).—Feb 12.—A lecture on "Hand-camera Work" was read and illustrated by lantern-slides. This was followed by a selection of sixty slides, exhibited by the Hon. Secretary, illustrative of the reign of Her late Most Gracious Majesty Queen Victoria. At the next meeting, March 12, the officers for the season 1901-2 will be elected, and the following demonstrations given: "Gaslight Printing," by Mr. J. Porritt; "The Aphengescope," by Mr. F. R. Rowley, F.R.M.S. The Hon. Secretary is Mr. G. Owston Marshall, "Carisbrooke," Victoria-road, Leicester.

Patent News.

THE following applications for Patents were made between February 4 and February 9, 1901:—

LENSES.—No. 2375. "Improvement in Photographic Lenses." Complete specification. H. L. H. SCHRŒDER.

LAMPS.—No. 2399. "Improvements in Candlesticks, Gig Lamps, Photographic Lamps, and the like." J. LAIDLAW.

REPRODUCING PHOTOGRAPHS.—No. 2456. "Improvements in Mechanism employed in the Production and Reproduction of a Series of Photographic Pictures." H. W. H. PALMER.

SPECTROSCOPE.—No. 2542. "A New and Improved Spectroscope." T. THORP.

VIGNETTER.—No. 2548. "An Adjustable Photograph Vignetter." H. B. FENWICK.

FILM SEPARATORS.—No. 2637. "An Improved Method of Separating Flexible Photographic Films, Cards, and the like." W. G. PERKS and H. G. M. FLETCHER.

CAMERAS.—No. 2675. "Improvements in Photographic Cameras." W. F. STANLEY.

PRINTING FRAMES.—No. 2683. "Improvements in Photo Engravers' Printing Frames." Complete specification. S. MCLAUGHLIN.

PRINTING PROCESS.—No. 2695. "Improvements in the Process of Printing on any Surface Sensitive to Light." A. VALENTIN-CRISTIAM-MAYALL.

DISTANCE INDICATOR.—No. 2829. "An Improved Distance Indicator for Photographic or other use." A. L. ADAMS.

PANORAMIC CAMERAS.—No. 2837. "Improvements in Photographic Apparatus for taking Panoramic Views." Communicated by A. Luino & Co. O. IMRAY.

SHUTTERS.—No. 2843. "Improvements in Photographic Shutters." Complete specification. THE THORNTON-PICKARD MANUFACTURING COMPANY, LIMITED, G. A. PICKARD, and C. G. WOODHEAD.

FORTHCOMING EXHIBITIONS.

1901.

February 22–27	.....	Croydon Camera Club. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath, S E.
,,	22–March 9	Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.
,,	23–March 2	Birmingham Photographic Society. Hon. Secretary, H. Vooght Cornish, Athletic Institute, John Bright street, Birmingham.
March 2–9	.....	South London Photographic Society. Hon. Secretary, Frank Goddard, Vanbrugh Hill, Blackheath, S.E.
,, 19, 20	.....	Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BONA FIDE DEALING.

To the EDITORS.

GENTLEMEN,—In THE BRITISH JOURNAL ALMANAC for 1901 I wrote as follows: "Stress of competition and lack of orders may cause photographers to cater for amateurs when, probably, if they consulted their own wishes, they would prefer to confine their attention to the practical pursuit of photography. If the restriction 'that, in order to secure dealers' terms, they must relinquish professional photography, and trade as dealers 'pure and simple' ever existed, it is probably now a dead letter, for there are many establishments which cater for the wants of the amateur in every possible way, and where, at the same time, professional photography is pursued to a considerable degree. In small towns it is very questionable whether a photographic goods dealer 'pure and simple' could exist. In any case, he would find the chemists formidable rivals, for most pharmaceutical establishments sell photographic requisites. From one point of view, to expect photographers desirous of trading as dealers to relinquish professional photography in order to secure dealers' terms, would be just about as ridiculous, or as logical, as to expect manufacturers to cater for the amateur or the professional, but not for both."

As I have repeatedly purchased plates—manufactured by the firm of which I believe I am correct in saying the principal is also the presiding genius of the Plate-makers' Association—from an establishment which caters for the wants of the photographic amateur in every possible way, and which does not do so, I am sure, merely for amusement or for the benefit of the health of the proprietors, it was with considerable surprise that I read the letter, published in this JOURNAL dated February 1, entitled, "The Definition of a Bonâ Fide Dealer." The authors of the letter referred to run a studio and a photographic stores, and they wrote as follows:—

"We have twice been removed from the Association's list of dealers, and twice reinstated, to our great detriment, loss, and annoyance; and this without a single question being asked, or a single explanation vouchsafed, by that body, in spite of voluminous correspondence on the subject. The action of the Association does not affect us one jot so far as discounts are concerned, because there is not the slightest difficulty in procuring the goods from several sources at identically the same rates as allowed to 'bonâ fide' dealers by the various firms who are members; but, on a question of principle, it affects the average small dealer very considerably, and it is on principle, and principle only, that we have spent time and money in seeing justice done."

I would like to ask, What does all this mean? Are some firms to be made the victims of the arbitrary dealing of the Plate-makers' Association, while other similar establishments may please themselves—sell what goods they wish, and take as many photographs as they can get commissions for? It would be interesting to have more light on the subject.

In my humble opinion, the Plate-makers' Association, who doubtless, know their own business best, are treading on very dangerous ground. There is that ugly word "boycott," and, seeing that the various brands of plate, &c., do not vary very materially in quality nowadays, although users may have their preferences, the Plate-makers' Association may find that the policy of making "flesh of one and fowl of another" detrimental to the interests of the various firms which go to make up the Association.—I am, yours, &c., J. A. REID.

Bedford, February 15, 1901.

THE WOLVERHAMPTON CAMERA CLUB.

To the EDITORS.

GENTLEMEN,—I have to announce that after this date this Club ceases to have a separate existence, as it has been amalgamated with the Wolverhampton and District United Photographic Society, a new Society which came into existence this day.—I am, yours, &c.,

HAROLD HOLCROFT, M.A., Hon. Sec.

Parkdale, Wolverhampton, February 13, 1901.

RIVAL PHOTOGRAPHIC SOCIETIES AT WOLVERHAMPTON.

To the EDITORS.

GENTLEMEN,—I have to thank you for so courteously inserting my letter re forming a photographic society for the town.

The meeting was held, and also an adjourned meeting, but the decisions arrived at are not satisfactory to other photographers and myself, and we have decided to start an independent society on broad and social lines, and especially to help and encourage beginners. Our motto is now, and always, "Out of Darkness cometh Light."

The club room and dark room of the Society are at No. 2, Exchange-street, Wolverhampton, and are now open.—I am, yours, &c.,

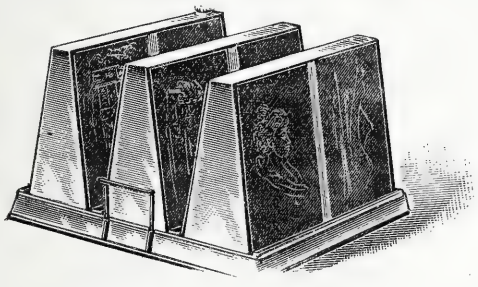
B. WILLIAMS.

No. 1, Tettenhall-road, Wolverhampton, February 15, 1901.

VARNISHING NEGATIVES.

To the EDITORS.

GENTLEMEN,—I notice the subject of varnishing negatives is interesting some of your readers just now. This gives me the opportunity of sending you a sketch of a little piece of apparatus that we are making



to enable this somewhat troublesome process to be conducted with more comfort than by the usual methods.

It is a tank holding hot water, and I think the sketch needs little explanation.

Varnishing may be done comfortably seated at a table. The tank need not be filled with hot water. As you may like to illustrate the subject, I send an electro.—I am, yours, &c, JOHN LEWIS, Sec.

Birmingham Photographic Co., Ltd., Stechford, near Birmingham, February 16, 1901.

ON JUDGING.

To the EDITORS.

GENTLEMEN,—Dr. Tulloch's paper has set me thinking as to the most satisfactory way out of the difficulty he presents. In a pretty large and varied experience of such matters, the one occasion that stands out as having given the best satisfaction to the public, to the exhibitors, and to the judges themselves, was that upon which we only awarded medals to photographs that each and all of us approved of, nemine contradicente. We were men of varied tastes and strong preferences, and each one called the attention of his brother judges to what he considered worthy of distinction, but unless every judge agreed the candidate was dropped, and we went on until we found photographs we could all conscientiously say were worthy of medals. Had we voted upon the disputed photographs, the minority of judges would have felt it very unsatisfactory to have their names added to an award of which they did not approve. So, for all practical purposes, I submit the above to be the wisest and most just method of proceeding. Our experience in the case cited proved most acceptable to the public, for, though some naturally thought other photographs might have been medalled, I never heard of one single person who objected to those who did unanimously medal. It also saved us a great deal of painful wrangling amongst ourselves.—I am, yours, &c.,

February 16, 1901. OLD JUDGE.

THE CONVERSION OF FORMULÆ.

To the EDITORS.

GENTLEMEN,—On page 1005 of the current ALMANAC you state that "the English grains per ounce have been converted into grammes per litre by multiplying them by $\frac{1}{7}^{6}$," and apologise for this excessive accuracy.

But, though the conversions as given in the ALMANAC are probably all quite close enough for practical purposes, I regret to say it seems their excessive accuracy may be challenged. The factor $\frac{1}{7}^{6}$ is obviously obtained by the proportion—$437\frac{1}{2} : 1000 :: 1 : \frac{1}{7}^{6}$. Hence, of course, this factor refers exclusively to the avoirdupois ounce of $437\frac{1}{2}$ grains.

But formulæ are written in apothecaries' 480-grain ounces, and as $480 : 1000 :: 1 : \frac{2}{1}\frac{5}{2}$, it is equally obvious that the factor $\frac{2}{1}\frac{5}{2}$ must be used both for the conversion of grains and drops into grammes (or c. c.) per litre.

If this be so, then the use of what we may call the avoirdupois factor, $\frac{1}{7}^{6}$, gives incorrect conversions and is misleading. How misleading I did not, unfortunately, realise until I had used it blindly for the conversion of some dozens of formulæ. But, even if the factor $\frac{2}{1}\frac{5}{2}$ were wrong, one expects the other factor to be consistently used in the ALMANAC. Such is not the case, however; for sometimes the avoirdupois, and sometimes the apothecaries', factor has been employed. For examples:—

Pyro soda, No. 1 (p. 1006). Sulphite of soda (2880 grs. ÷ 32 =) 90 grains to one ounce, converted to 188 grammes per litre. This is $90 \times \frac{2}{1}\frac{5}{2}$, in flat contradiction to what is said below; for $90 \times \frac{1}{7}^{6} = 205\frac{5}{7}$.

Pyro soda, No. 2 (same page). Sulphite of soda (960 ÷ 12 =) 80 grains to one ounce, converted into 166 grammes to one litre. This is again $80 \times \frac{2}{1}\frac{5}{2}$, since $80 \times \frac{1}{7}^{6} = 182\frac{6}{7}$ grammes.

Metol (p. 1007). Carbonate of potash (240 ÷ 8 =) 30 grains to one ounce = 69 grammes per litre. This is $30 \times \frac{1}{7}^{6}$, since $30 \times \frac{2}{1}\frac{5}{2} = 62\frac{1}{2}$ grammes.

Hydroquinone, No. 2 (p. 1011). Potassium hydrate, 10 grains to one ounce = 23 grammes to litre. This is $10 \times \frac{1}{7}^{6}$, for $10 \times \frac{2}{1}\frac{5}{2}$ would give $20\frac{5}{8}$ grammes.

Here, then, are four formulæ taken at hap-hazard, two converted with the incorrect avoirdupois factor $\frac{1}{7}^{6}$, and two converted with the correct apothecaries' factor $\frac{2}{1}\frac{5}{2}$. It is plain such converted formulæ are not comparable, even if the dissimilarity of the results give rise to no practical inconvenience.

Since writing the foregoing, it has occurred to me that a brief statement of the reason for the use of one factor when the formula is written in avoirdupois weight, and of another when written in apothecaries' weight, may be serviceable. It is as follows:—

By hypothesis, one fluid ounce = one litre. Therefore $437\frac{1}{2}$ grains avoirdupois = 1000 grammes, since $437\frac{1}{2}$ grains is the weight of one fluid ounce of water. The factor for conversion is $\frac{1}{7}^{6}$. But, whereas $437\frac{1}{2}$ grains = one ounce avoirdupois, there are 480 grains in one ounce apothecaries'. Hence the need of a smaller factor—viz., $\frac{2}{1}\frac{5}{2}$—for conversion in the latter case to obtain compatible results.

This may be simply demonstrated by considering two formulæ, each containing four ounces of a particular ingredient, and each with $437\frac{1}{2}$ grains of this ingredient per fluid ounce, but one formula written in avoirdupois and the other in apothecaries' weight.

Under such circumstances, it will be clear that exactly a quarter of the total amount of the ingredient appears in each fluid ounce in the case of the avoirdupois formula, but considerably less than a quarter in each fluid ounce in the case of the apothecaries' formula. The use of the factor $\frac{1}{7}^{6}$ for the avoirdupois, and of the factor $\frac{2}{1}\frac{5}{2}$ for the apothecaries', remedies this in conversion. It is really astonishing how this trap succeeds. Take the case of the two formulæ on page 1016 of the ALMANAC (Austin-Edwards's). In the pyro solution there are 6 grains to the ounce, which is rendered as 12·5 grammes per litre. In the following formula there are 6 grains hydroquinone to the ounce, rendered as 14 grammes to the litre. In the latter case the factor $\frac{1}{7}^{6}$ has been consciously used, but in the former the factor $\frac{2}{1}\frac{5}{2}$ unconsciously, I suspect. This mistake duly appears elsewhere, *e.g.*, in *The Year-Book of Photography*, 1900, though I do not know whether your labours were acknowledged.

I have learnt to appreciate the value of that factor $\frac{1}{7}^{6}$ in converting $\frac{480}{437\frac{1}{2}}$ grains into $\frac{1097\frac{1}{2}}{1000}$ grammes, to put it briefly. But I am still in doubt whether it is permissible with accuracy, and without warning, to assume that "1 oz." in a photographic formula means $437\frac{1}{2}$ grains, whatever may be the case in a pharmacopœia prescription. I fancy most readers, for instance, of the formulæ on page 1016 of the ALMANAC, would understand 6 grains pyro to the ounce in the first, and a similar quantity of hydroquinone in the second; but, if "pyro, 1 oz.," means "pyro, $437\frac{1}{2}$ grains," one is not at liberty to understand equality. Guillotined ounces of this kind are distressing from the grain-per-fluid-ounce point of view, however. Especially is this the case when one has carefully tabulated some sixty or seventy formulæ with the undecapitated ounce as a basis, and used the factor $\frac{1}{7}^{6}$ uniformly for conversion. For, if the ounce of $437\frac{1}{2}$ grains is to be understood where any ingredient has been given in ounces in the formula, the grains per fluid ounce will differ from the obtained results, and the conversions will be wrong in consequence. But, as I cannot see the advantage of assuming the avoirdupois ounce in formulæ when they are supposed to be written in apothecaries', it seems preferable to understand the 480 grain ounce when calculating grains per fluid ounce, and using the factor $\frac{1}{7}^{6}$ on the result for conversion. It can then easily be stated that, if the formula is in reality in avoirdupois, the grammes per litre are between $\frac{1}{17}$ and $\frac{1}{18}$ too many.

I observe, by the way, that the formula on page 22 of the JOURNAL for January 11 seems to be converted by the factor $\frac{2}{1}\frac{5}{8}$, approximately the mean between $\frac{1}{7}^{6}$ and $\frac{2}{1}\frac{5}{2}$, which does not seem particularly advantageous.

I hope you will give your opinion on the 480 grain $\times \frac{1}{7}^{6}$ scheme I propose, *or* the $437\frac{1}{2}$ grain $\times \frac{1}{7}^{6}$ plan followed in the ALMANAC.

N.B.—The following is an example of how the scheme might be carried out:—Formulæ are presumably written in apothecaries' 480-grain ounces, and the grains per fluid ounce have been calculated on this basis, unless the avoirdupois ounce of 437½ grains is specified. Grains per ounce have been converted into grammes per litre by multiplying with the factor $\frac{1}{7}^{6}$ and drops per ounce into c. c. per litre by multiplying with the factor $\frac{2}{1}\frac{5}{2}$. Formulæ written in apothecaries' weight may generally be compounded with sufficient accuracy in avoirdupois, when the chief ingredients are given in ounces, by simply taking $\frac{1}{1}\frac{0}{1}$ of the amount of water mentioned and reading the number of ounces of the ingredients unaltered, as if avoirdupois.

PYRO SODA. No. 1.

A. Sulphite of soda.....	6 ounces,	15· grains,	34·28 grammes.
Water to	96 ,,	·5 ounces,	500· c. c.
Pyrogallic acid	1 ,,	2·5 grains,	5·71 grammes.

(Dissolve the sulphite; add sufficient citric acid to redden blue litmus paper; then add the pyro.)

B. Carbonate of soda ...	3 ounces,	7·5 grains,	17·14 grammes.
Carbonate of potash	1 ,,	2·5 ,,	5·71 ,,
Water to	96 ,,	·5 ounces,	500· c. c.

Take equal parts. In very hot weather add more water. If preferred each solution may be made up to 32 ounces only, with subsequent dilution immediately before use.—I am, yours, &c., J. DORMER.

February 15, 1901.

[Mr. Dormer's letter, for which we are very much obliged to him, invites the obvious answer that photographic chemicals are retailed by the avoirdupois ounce of 437½ grains, and it is upon that basis that formulæ, which in the main trace their origin to commercial sources, are expressed for practical use. But the confusion—needless, we think—that has arisen in Mr. Dormer's case between avoirdupois and apothecaries' weight, appeals to us as one more reason for the adoption of a system of weights and measures — the decimal — which would obviate all doubt as to the meaning and intentions of the authors of formulæ. With regard to Mr. Dormer's criticisms of the ALMANAC conversions, the gentleman to whom we are indebted for them is good enough to supply us with the following rejoinder:—"The conversions commented on have all been correctly made; the criticisms on them are the result of the absurd system of English weights and measures, and the conservatism of a photographer who persists in using what are exploded. A chemist may use apothecaries' weight in making up prescriptions written in those denominations, but when he sells chemicals he uses, I believe, entirely avoirdupois weight; certainly dealers (who are not dispensers) are obliged to do so by law, and I should be very much astonished if Mr. Dormer bought six ounces of sodium sulphite and got 2880 grains. Pyro is usually sold in ounce bottles, and I conceive that the formula No. 1 (on which Mr. Dormer comments) was given the form it has in order to avoid the trouble of the very inconvenient weighment of an ounce of pyro, and that it means that a bottle should be used. That bottle would contain an ounce avoirdupois only, not only on account of the law, but because it is more profitable to sell 437.5 grains than 480 for the price of an ounce. It is only fair to suppose that the word ounce means the same thing throughout the formula. As the ounce avoirdupois weighs exactly one fluid ounce of standard water, we have, comparing the weights of the items, 6/32=188/1000. Mr. Dormer seems to have taken his fluid ounce as 480 grains. The case of the formula No. 2, and also of the metol and hydroquinone formulæ, all are correctly converted. So, too, of the two Austin-Edwards formulæ. The confusion caused by the equivocal words used in tables is at the root of the whole matter, and the sooner photographers take to expressing themselves in unmistakable terms the better; meanwhile I would suggest that those who mean their formulæ to be understood in apothecaries' weight should avail themselves of the hieroglyphs used by physicians. We should then be warned what we have to expect." A further letter on the subject suggested by Mr. Dormer's article on February 8 given on p. 127. EDS. *B.J.P.*]

PHOTOGRAPHERS, ORGANIZE!

To the EDITORS.

GENTLEMEN,—Doubless your readers have seen the very extensively advertised offer of cigarette manufacturers and soap manufacturers to copy photographs 6½×4½ at 2s. 6d. per dozen, on condition of the applicants sending to them a certain number of cigarette or soap wrappers, together with a form of declaration that the photos were taken by professional photographers at the sender's whole expense, or by the sender, or by a friend, whose consent they have obtained to have it reproduced. This new invasion of the poor photographer's business will prove very injurious, and I therefore suggest that you, or some other influential gentlemen, should endeavour to organise the professional photographers throughout the United Kingdom for the purpose of thwarting, if possible, these insidious inroads upon the photographic business.

I observe that mention is made in the King's Speech of a proposed amendment of the Copyright Acts. I trust the Royal Photographic Society is alert, and will use their influence with the Government to procure the insertion of a clause in the amending Act safeguarding photographers' interests.

This is an age of combination, and, unless photographers will unite for mutual protection, I am afraid they will go to the wall.

I enclose one of the advertisements referred to above for your perusal in case you have not seen it.—I am, yours, &c., J. RUDSTON.

February 18, 1901.

[The advertisement enclosed by our Correspondent is that of Messrs. Lever Bros., the "Sunlight Soap" house. It resembles in terms the advertisement of Messrs. Ogden, to which we referrred last week. EDS. *B.J.P.*]

A SOCIETY FOR STONEHOUSE.

To the EDITORS.

GENTLEMEN,—Can you find space in your valuable paper to insert a paragraph noting the formation of a Camera Club at Stonehouse, Devon?

The Club was instituted in November, 1900; since then we have received several new members, which has encouraged us to hope for a successful future.

The meetings are held weekly in a room kindly placed at our disposal by Mr. Bayley at the Photographic Stores, 3, Union-street, Stonehouse. Mr. H. E. Ford is President, and Mr. J. C. Smith Vice-President.

I intend sending you a short report of meetings when of sufficient general interest.—Thanking you in anticipation, I am, yours, &c.,

SAMUEL H. PAYNTER, Hon. Secretary.

45, Admiralty-street, Stonehouse, Devon, February 17, 1901.

[We shall be pleased to receive the reports, and hope the Stonehouse Society will have a successful and useful career. EDS. *B.J.P.*]

A SOCIETY FOR TEWKESBURY.

To the EDITORS.

GENTLEMEN,—Can you tell me where or to whom to apply for any lectures or papers on photography, illustrated by lantern slides, that would be useful to our Society just started?

Can you give me any hints or information as to the best means of working and carrying on of a photographic society in a small town like Tewkesbury, or to whom or where could I apply for such information?—Thanking you in anticipation, I am, yours, &c.,

JESSE J. PRICE, Secretary.

[This week, it will be seen, we have received particulars of the formation of societies in Tewkesbury, Stoke-on-Trent, Swansea, and Stonehouse—surely an encouraging sign! With regard to Mr. Price's questions, for lectures he should address the Secretary of the Affiliation of Photographic Societies, 66, Russell-square, London, W.C. By joining the Affiliation the Tewkesbury Society may utilise lectures specially prepared. The other question will be found answered in the append to the letter which follows this.. EDS. *B.J.P.*]

A SOCIETY FOR SWANSEA.

To the EDITORS.

GENTLEMEN,—The formation of a photographic society in Swansea is meeting with the greatest success. Already a large number of amateurs and some professionals have given in their names to join. Will you please make it known to your subscribers in this district that those who have not been written to may, if anxious to become members, communicate with the Secretary (pro. tem.), C. H. ROGERS.

33, Glanmor-crescent, Swansea, February 18, 1901.

A SOCIETY FOR STOKE-ON-TRENT.

To the EDITORS.

GENTLEMEN,—We are trying to organize a photographic society in our town, and shall esteem it a great favour if you could give me any advice on the matter; and, if you have a list of rules for forming the same, if you could oblige me with them. We have a good number of amateur photographers in the town, and are receiving a great encouragement from influential gentlemen, one being my father, who is the Mayor.—Thanking you in anticipation, I am, yours, &c.,

EDWIN LEADBEATER.

55, Hartshill, Stoke-on-Trent, February 16, 1901.

[In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for several years past we have printed the rules of the Photographic Club (Lon-

don). If our Stoke-on-Trent friends—to whom we wish the utmost success in their new Society—will take those rules for guidance, they will find them, in the main, admirably adapted for their purpose. Eds. *B.J.P.*]

DEVELOPER FORMULÆ.

To the Editors.

Gentlemen,—With reference to Mr. Dormer's note in your issue of February 8, I would offer some remarks. Mr. Dormer says, "It is tacitly assumed that the ounce in a photographic formula is one of 480 grains (or drops)." Why so? An ounce is defined by Act of Parliament (Weights and Measures Act of 1878). By section 14 it is "one sixteenth part of the imperial standard pound,"[1] and no other ounce can be used save under the exceptions of section 20; for by section 19 "every contract, bargain, sale, or dealing made or had in the United Kingdom . . . shall be deemed to be made and had according to the imperial weights or measures ascertained by this Act, or some multiple or part thereof," &c. By section 20 are excepted "gold and silver, and articles made thereof, including gold and silver thread, lace or fringe, also platinum, diamonds, and other precious metals or stones, which may be sold by the ounce troy or any decimal parts of such ounce." Second, "Drugs, when sold by retail, may be sold by apothecaries' weight." Section 21 provides that a contract or dealing shall not be invalid on the ground that the weights and measures referred to therein are weights or measures of the metric system.

Practically no one does sell chemicals by apothecaries' weight (I doubt if they ever did even before this Act). If Mr. Dormer asks for any number of ounces of a chemical, he will certainly get imperial (or avoirdupois) ounces; if he wants apothecaries' ounces of 480 grains, he ought, in strictness, to mention the number of grains he requires. Thus the difficulty of obtaining what he considers an ounce is exactly the same as in obtaining metric weights, and it is no more, for, I believe, any large dealer will weigh for him in metric weights if he asks for them (I know that Messrs. J. and J. Griffin, of Sardinia-street, will do so, for they told me so); and I have not the slightest doubt that any of the importers of chemicals will import metric packets if asked to do so. I only wish that they would notify their readiness to do so in their advertisements, and even keep a small stock of such packets. Indeed, I have been informed that in some cases a half kilo is actually sold as a pound where the competition is not very close!

Let me add one more remark. Mr. Dormer speaks of the need of some explanation as to whether the water in a solution is to be used as written, or the whole to be made up. Common sense seems to say that where there are no directions to the contrary, the several quantities laid down should be severally taken and mixed. Unfortunately, photographers seem to have agreed to leave common sense on one side, and muddle their meanings when possible.—I am, yours, &c., J. F. T.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the Editors.

Gentlemen,—In reply to Mr. Farmer's second letter, I must first point out that his statements and references and the facts do not hold together. One would infer that Clerk-Maxwell, Du Hauron, Tallent, Farmer, and all of the practical three-colour process operators are agreed that the colour record should be made through "pure" red, green, and violet screens, and that I am singular in differing from so many authorities who all think alike. I am sure nothing but a violent distortion of the facts would lead to such an inference. Maxwell may have meant to indicate the use of pure-colour screens for photographic analysis; but I cannot believe that he did so, while he had his own colour analysis of the spectrum before him. Du Hauron certainly did not indicate "red, green, and violet" pure-colour screens. Whenever he mentions red as one of the triad of colours, the other two elements are yellow and blue; and, whenever he mentions green and violet, his other element is orange; and he explicitly describes violet as a mixture of blue and red, and makes it very clear, it seems to me, that his "orange, green, and violet" were meant to be red+yellow, yellow+blue, and blue+red. I have not yet heard definitely from Mr. Tallent, but I doubt very much if he will subscribe to the use of "pure-colour" screens for analysis; in fact, he expressly spoke of "curves derived from," &c., in his letter, to which I have already replied as fully as its indefinite nature permitted. What the "practical" three-colour process operators think is of no consequence, in view of the results which they are now obtaining, up to the point of commencing their "faking" operations.

Mr. Farmer also overlooks the fact that Maxwell treated only of positive synthesis, anl is therefore made to appear to condemn the kromskop method, which has not broken down on the most difficult test subjects when properly carried out. To be consistent, Mr. Farmer should assert that kromskop reproductions must be very bad indeed because the negatives were not made through pure-colour screens!

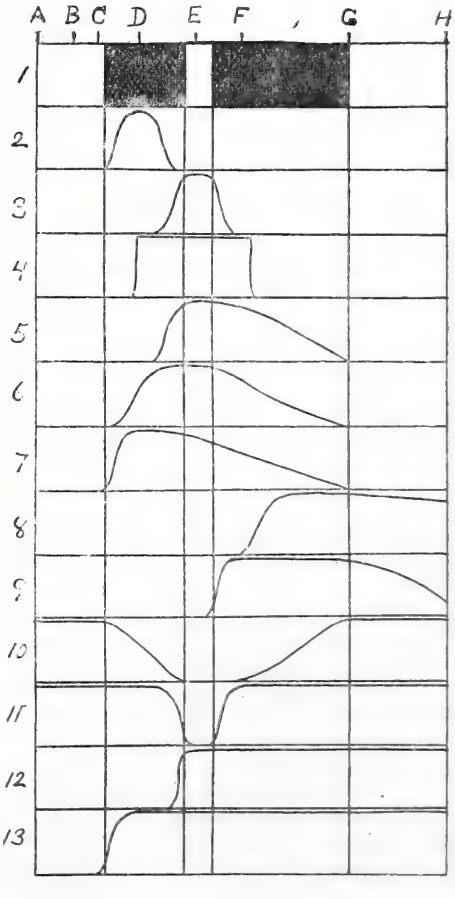
Again, Mr. Farmer makes use of my observation, that no three printing colours can reproduce pure spectrum colours without degradation in ordinary white light, as if it proved a defect in the process of analysis; whereas I have expressly stated that this defect is inherent in the printing colours themselves, which are physically incapable of any series of combinations which will transmit the various spectrum colours both freely and exclusively in narrow bands.

Fortunately, since Mr. Farmer "cannot follow" my argument, he states a definite proposition, which can be reduced to diagrammatic representation, and some of its weaknesses shown by a few easily comprehended examples.

I shall insist, in order to make my criticism as simple and obvious as possible, on carrying Mr. Farmer's idea to its logical conclusion, and employing screens which are actually "pure" red, green, and violet.

One of these screens, then, will transmit only those spectrum rays between A and C ¼ D, another only those close to E, and another only those between G and H. The spectrum rays between C ¼ D and D ¾ E, and those between E ¼ F and G will have no action in the negative making process. Mr. Farmer admits that with such screens we cannot reproduce the spectrum. I will show that, with such screens, we cannot differentiate a good many colours that one is likely to meet with in the practical applications of the process.

Remembering that no action takes place except by pure red, green, and violet spectrum rays, let the clear spaces R, G, V, in the first line of the following diagram represent the spectrum rays available for nega-



tive-making, and let 2 to 13 represent the spectrum absorption of colours which are to be photographed.

It is evident that No. 2 colour, which is a decided, though light, blue, would act alike in all three negatives, and must therefore reproduce as white..

Nos. 3, 4, 5, and 6 are different shades and qualities of pink or purple, yet, being all equally represented in the active portions of the spectrum, all would reproduce exactly alike, both as to hue and luminosity value. No. 7, although the darkest colour of all, would reproduce the lightest, because the absorption is not so complete in the green.

Nos. 8 and 9 are two kinds of yellow, and that which is lightest to the eye would be the deepest and purest yellow in the reproduction, because it absorbs the violet most completely. If the "violet" screen did not cut out ultra-violet light, the deeper yellow would reproduce as a very feeble colour indeed. Nos. 10 and 11 are a bright green and a much deeper and purer green, which would reproduce

[1] By the Act 18, 19 Vict. Cap. LXXII. it is enacted that $\frac{1}{7000}$ part of the imperial standard pound shall be one grain.

exactly alike. Nos. 12 and 13 are a good orange and a deep red, which would both reproduce as deep red.

These examples are of a very elementary character, but serve, without bringing in the question of synthesis methods at all, to prove conclusively my proposition that, to depart from the Maxwell curve analysis in the direction of "pure colour" screens, involves the translation of an infinite variety of hues into a comparatively limited number. A compromise is, of course, possible, and may be justifiable for certain purposes, as I have often pointed out; but I maintain that the perfect differentiation of hues and luminosity values is possible only by carrying the colour curve idea to its logical conclusion, and making the spectrum itself the test object. To doubt this is, to my mind, equivalent to questioning the law of the conservation of energy.

If Mr. Farmer objects that the absorptions which I have shown are exceptional, my reply is that eight of them represent, with sufficient accuracy, well-known coal-tar dyes, one is a solution of a common chemical salt, and two are selenite colours in the polariscope. I have drawn upon my memory for well-known absorptions, and could probably multiply by many times the number of suitable examples by examination of flower colours and coal-tar dyes alone.—I am, yours, &c.,

F. E. IVES.

Philadelphia, February 5, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

J. Worsnop, Rothbury.—*Photograph of the late Right Hon. Lord Armstrong.*

F. W. Shephard, Church-street, Lyme Regis.—*Photograph of the proclamation of King Edward VII.*

J. L. Hayton & Son, 70, Botchergate, Carlisle.—*Photograph of proclaiming Edward VII. King.*

W. H. Armstrong, Finkle-street, Stockton-on-Tees.—*Photograph of the proclamation of King Edward VII.*

J. L. Hopper, 4, Pendle-street, Nelson, Lancashire.—*Photograph of the proclamation of King Edward VII.*

P. W. Morehen, 12, Shakespeare-road, New Brompton, Kent.—*Photograph of a heap of old sewing machines.*

TONING.—H. SMITH asks : "With P. O. P. prints toned in sulphocyanide bath, without previously washing, would the silver from the prints be left in the bath ?"—In reply : Some portion, but not much would be.

BLOCKS FOR PHOTO-ETCHING.—"F. D." writes : "Could you tell me where I could get sensitised blocks for photogravure or any form of photographic etching, making a bas-relief photograph?" — In reply : We don't think they are supplied commercially. You might write to Messrs. Penrose and Co., Upper Baker-street, W.C. They might, possibly, put you in the way of getting them—if they are to be had.

LANTERN MASKS.—"LANTERN MASKS" writes : "Will you kindly inform me from whom I can obtain good evenly cut, square-cornered lantern masks ; I have tried a number of well-known dealers, but cannot get correctly cut ones."—In reply : We have had no difficulty in getting masks correctly cut. All the principal dealers in photographic goods supply them, and what we have obtained from them have been satisfactory.

STAINED NEGATIVE.—J. O'CONNOR. The stain is due to the negative not being perfectly fixed, the bromide of silver not being dissolved out of the film. Although you say it was in the hypo the usual time, it is clear that it was not thoroughly fixed. As the negative has been exposed to the light while several prints were taken, we doubt if the stains can now be removed. It must be borne in mind that, during very cold weather, the negative must be left much longer in the fixing solution than the "usual time."

COPYRIGHT.—"X. Y." writes : "A certain lord had an historical building in his private grounds, which he allowed any one to visit and photograph. His successor in the property refuses admission, and prohibits even the sale of photographs. Has he the power to stop, or what can he do to any one who reproduces copies from a negative taken in the time of the first lord ? Would there be any difference in the case if, instead of selling simply photographs, the original was used for book illustration."—In reply : Although the present owner of the property may prohibit any more photographs of the building being taken, he cannot prohibit the publication, or sale, of any that have previously been taken.

COLLODION FOR POSITIVES.—G. B. WATTS writes : "I want to make some collodion for ferrotypes and glass positives. Will you please tell me if the methylated spirit, with the mineral spirit in it, as sold at the oil shops, will do for the iodising solution and the collodion, as I cannot get the spirit free from the mineral oil ?"—In reply : No, it will not. Methylated spirit, when free from the mineral oil, is not suitable for collodion for the wet-plate process. Pure spirit is that which should be employed if you wish to succeed.

SEASON ENGAGEMENT.—"OPERATOR" writes : "Will you please tell me what is a season's engagement ? I am offered an engagement for the season at a seaside place, but I do not quite know how long a season may mean ?"—In reply : An engagement "for the season" may mean anything, or at any time. If you accept the appointment, you had better have an agreement (in writing) for a definite period, otherwise you will be liable to dismissal at any time if business happens to get slack, as many have found to their cost who have taken "season engagements."

MICRO-PHOTOGRAPHY.—BASTIAN BROS. (Rochester, N. Y.) write : "We are looking for mirror lenses which have photographs in. They are small lenses with photographs in, such as are put in novelties, &c. Mr. Dundas Todd referred us to you, thinking that you could probably give us the address of some one who manufactures same in Europe."—In reply : These small lenses are, we believe, made in France. But we regret that we do not know the addresses of the manufacturers. Possibly some reader may know and will kindly supply the desired information.

COPYRIGHT.—"C. G W." writes : "(1) If A. B. has a house and C. D. a photograph of that house, can A. B. restrain C. D. from selling copies of the photograph, either by themselves, or as illustrations to a book or periodical ? (2) Would the case be altered if the predecessor of A. B. had allowed C. D. to photograph the house and place, there being the assumption that the place is private and cannot be taken from a public road or place ?"—In reply : (1) We should say not. (2) In this case the owner of the negative would be justified in selling photographs of the house.

FLUTED GLASS FOR STUDIOS.—"LIGHTING" asks : "Is there any advantage in using fluted glass for studios ? I believe that the light is not only broken up, but more brilliant lighting is produced. Do you know any first-class photographers using the glass ? Where can I get full information re this matter ?"—In reply : There is no advantage whatever in using fluted glass in the studio, except that unsightly surroundings outside cannot be seen from within the studio ; also that things within cannot be distinctly seen from the outside. These are the objects in using fluted glass.

OWNERSHIP OF THE NEGATIVE.—"COPYRIGHT" writes : "We took a photograph of a lady client (since deceased), and now are being approached by the relatives for the sale of the negative. (1) Can we or the relatives copyright the negative, no agreement having been made at the time of sitting, or afterwards ? (2) Can we prevent the photograph from being copied or enlarged by any other professional or amateur ? (3) If the next of kin of the deceased subject is the proper person to copyright the negative, and, if so, can they prevent us from executing orders from relations from the said negative ?"—In reply : (1) The negative is your property to dispose of as you may think fit ; but copyright in the prints is another matter. This belongs to your client. (2) No. (3) In all probability the Court would grant an injunction restraining you from supplying prints from the negative.

STUDIO-BUILDING.—B. KNIPE writes : "I have a small studio eighteen feet by nine feet, six feet six inches high at eaves, nine feet six inches at ridge lean, to four feet each end is opaque. Glass extends to within two feet of floor and two feet of ridge. (1) What width blinds to run from eaves to top of glass, and what colour would you name the same ? (2) What colour would you paint the walls ? The studio faces S.E. No sun shines on it after one o'clock. (3) What focus lens should I want to get cabinet full length with such a studio ?"—In reply : (1) We should advise the blinds to be about four feet wide and of a light green, or dark blue, colour. (2) French grey will be a pleasing and suitable colour. (3) A lens of from nine to ten inches equivalent focus. That will require about fourteen or fifteen feet between sitter and camera A shorter focus lens will not cover the plate sharply unless it is considerably stopped down. The perspective will also be unpleasantly violent.

FAULTY ALBUMEN PRINTS.—W. R. WILCOCKS writes : "I herewith send you a few prints, the paper was floated on an eighty-grain bath floated five minutes, ———'s enamel paper. We have tried a sixty-grain bath floated three minutes, which gives mealy prints (when printing) ; the paper looks all right before toning (I enclose a piece for you to see), the albumen comes off in the washing of the prints even when they are washed off in an hour, some of the prints you can rub the top film off altogether. We have done our own sensitising a year now, and have not had the trouble (we have made a new bath up in case anything had got in old one), these prints are from new bath. I should be extremely obliged if you can trace the cause of same."—In reply : We should recommend you to send a few sample prints to the makers of the paper They may possibly be able to suggest a remedy. Five minutes' floating on an eighty-grain silver bath seems a rather strong sensitising, considering the strength of the chloride now generally used in the albumen.

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EX CATHEDRÂ.

"Guinea Gold" and "Sunlight Soap" Photography.

Several further letters on the latest developments of coupon photography have reached us this week. The writers unite in agreeing that Messrs. Ogden's and Messrs. Lever's competition is harmful to established photographers, and there is not the slightest doubt that it is. We, who for many years past have written in condemnation of free portrait swindles, native and foreign; cheap enlargement schemes promoted by newspapers; the coupon system in its numerous guises and disguises, and, above all, the peculiarly low and disgraceful practice of offering enlarged bromides to the public for a few shillings, under the shelter of the alluring falsehood that a photographer would charge pounds or guineas for the same thing—we who have pilloried these things times out of number do not need telling that when large cigarette and soap manufacturers add photographic branches to their businesses and "cut the prices," the effect on the photographic profession is unpleasant, temporarily, at any rate. This goes without saying — it is so obvious as not to need mention. Moreover, it is the keenest of keen competition, but, as we pointed out a fortnight ago, Messrs. Ogden and Messrs. Lever—mere dividend-earning agencies though they are—are well within their right in opening up new branches of businesses by means of cheap photography; just as much, indeed, as photographers would be in attracting sitters by offers of cigarettes and soap. Cross-trading, if we may so express ourselves, however much it is to be deplored on particular grounds, and it certainly is in the present case, is defended by the unanswerable plea of those who engage in it, that it is legitimate business. We need not look far for some very notable parallels. The great London newspapers, such as the "Times," the "Standard," and the "Daily Telegraph," some time ago turned booksellers, and are selling standard literature at low rates. To go farther back, the stores took their rise in price-cutting, by which every retail trade in the country was affected. In principle, therefore, cheap photography in alien hands is no new thing.

* * *

"The Tyranny of Might."

Our remarks on this subject a fortnight ago have been construed into a commendation of Messrs. Ogden's invasion. We do not think that what we wrote bears that construction. A recognition of a right by no means implies approval of its exercise. But lest there be any remaining doubt on the subject, let us say emphatically that we regret and condemn Messrs. Ogden's and Messrs. Lever's action. There is no doubt whatever that they are doing very great harm indeed to professional photography by selling twelve mounted bromide prints for half-a-crown! Scores, if not hundreds, of struggling little professionals in all parts of the country will have cause to bitterly regret that these great trading firms, taking advantage of the cheapness of production afforded by modern means of bromide printing, are selling copies of photographs at prices with which the ordinary photographer cannot compete. If we have given Messrs. Ogden, whose letter appears in our Correspondence columns this week, the impression that we approve of their action, we are sorry at having misled them. Habitual readers of this JOURNAL

well know our sentiments on things of this kind. Lack of space prevents our printing all the letters we have received on the subject; but those published are sufficiently representative of the general opinion. It is to be regretted that photographers have no authoritative organization to act in crises of this kind. The R.P.S. and the Copyright Union cannot move, although the latter body may have some legal work to do if Messrs. Ogden or Messrs. Lever are not sufficiently careful of the snares of photographic copyright. We should be sorry to run their risks. Our chief regret in connexion with this unfortunate affair is that we are powerless to suggest a remedy generally applicable by way of resistance to the encroachments of these cigarette and soap sellers, who have, of course, adopted the twelve for 2s. 6d. idea at the instance of a well-known firm; but we should regard a photographer who could not persuade a purchaser of such photographs that they were worth exactly what was charged for them, no more and no less, and that the infinite variety of photographic printing admitted of other kinds of results which necessarily cost more—we should regard such a one who failed to maintain his position on this point as being a very poor man of business indeed.

* * *

"Wake up, England!" Probably every photographer in these islands depends, to some extent, upon American or Continental material for the means wherewith to practise his profession or his pastime, and so he has something more than an indirect interest in the recent apprehensiveness shown in the press and by public speakers at the black shadow of foreign competition which is said to be blighting England's industrial supremacy. But foreign competition is no new theme for amplification by frightened publicists. A contemporary disinters the following passage from the letters of Junius, published 134 years ago: "The taxes and duties necessarily laid upon trade in order to pay the interest of a debt of one hundred and thirty millions are so heavy that our manufactures no longer find a vent in foreign countries. We are undersold and beaten out of the branches of trade of which we had once an almost exclusive possession. The progress towards a total loss of our whole foreign trade has been rapid; the consequence of it must be fatal." Have we not all read something strongly resembling this during the last few months? England's position in relation to its chief competitors, America and Germany, is discussed by a contributor to one of the monthly reviews, who points out that the efficiency of the nation has been vitiated by the sense of ease that has followed an unexampled prosperity; but in his opinion the drowsiness will disappear when the comfortable cause is gone, and the pressure of American and German competition becomes more constant and pinching. The exact want of the nation is deeper and more scientific cultivation. The material is not exhausted and it exists to be developed; since there is a stronger smack of the vigorous barbarian than any suggestion of morbid exhaustion in the English character. The author goes on to remark that "the weakness of the British, as compared with their two greatest competitors, is the difference in the view which is taken of the relation between pleasure and work. The German, with his thorough, intellectual interest in his own line, takes more pleasure in work than in play. The American goes with irresistible vigour into both work and play, while the average Briton thinks far too much of sp while at his job. America cannot be prevented in any c from attaining, at some period during the twentieth c tury, the industrial leadership of the world, and the r task of Great Britain and her best chance of success, if is thoroughly awakened in time, will be in the struggle w Germany for second place." The writer finds considera satisfaction as regards the future in the fact th "the immense lead which Great Britain at p sent possesses, which is considered to be itself a solid and enormous asset, if rightly derstood and utilised, should enable that country to fi a formidable defensive struggle in the endeavour to ma the inevitable encroachment more gradual than the P German mind imagines, and to hold its own for all su cient periods of power and prosperity until the reconsid ation of the British outlook a hundred years hence. It pointed out that the total volume of British exports a imports is still half as much again as that of Germany, a twice that of the United States; and the reader is remind that it takes time for the swiftest pursuer to reduce a lon Large as this question is there is not one reader of the lines who is not affected by it, so that our references a quotations cannot be considered out of place.

* * *

Allotropic Silver. A month ago we printed in our supplem the late Mr. M. Carey Lea's paper on t photo-salts of silver, which bodies the author believ might have some bearing on direct, or pigmentary, ph tography in natural colours. Carey Lea's paper, as were prepared to find, had been forgotten by all but t few who, like ourselves, make a point of keeping in mi the existence of such records of experimental work as m temporarily drop out of notice. We have grounds for b lieving that Carey Lea's experiments on the photo-salts silver will be repeated by more than one student of colo photography, and thus our object in publishing his deep interesting paper will be attained. That an important pie of work of this kind should have to wait fourteen yea before anybody thinks it worth while to pay it more th passing notice is no compliment to that spirit of catho inquiry which animates British investigators. It rath indicates that we are regrettably indifferent towards forms of scientific progress, save those we ourselves initia In respect to Carey Lea's work we desire to draw attenti to a second and lengthy paper by the same author which v reprint in this month's supplement to the JOURNAL. treats of allotropic silver, and shows that the metallic ba of photography exists in a variety of coloured form which have many properties in common. In Carey Lea mind, between the coloured photo-salts and the colour varieties of allotropic silver, there was a stron connexion. As possibly having some bearing on the su ject, speculative though it still undoubtedly is, Care Lea's paper on allotropic silver deserves attention. The o dinary photographer who only knows silver in the form a whitish metal, or a dark pigment obtained by depositio will probably be astonished to be told that it can be mad to present itself in a variety of beautiful coloured forms.

* * *

The Oxford Convention. The preliminary circular in connexion wit the sixteenth meeting of the Photographi Convention of the United Kingdom has been issued. In a

nofficial way we have already published the outline of the rogramme for the week, July 8-13, but the circular before us nters somewhat more fully into detail, and as many of our eaders may not otherwise see it we quote the principal por- ons of it for their information, and with the hope that the ery tempting bill of fare here set forth may induce them to ttend the Convention next July. Arrangements have been ade to hold the meetings in the New Municipal Buildings. he opening ceremony will take place in the Town [all, a magnificent room capable of accommodating early 2000 persons. The usual trade exhibition f apparatus and pictures, and the evening meet- gs, will be held in the Assembly Room adjoin- g; a noble apartment with a fine Elizabethan mantelpiece, rmounted by a minstrels' gallery. The members will be elcomed to Oxford by the Mayor, Mr. G. Claridge Druce, .A., who will be supported by many influential residents the city, and the members of the Oxford Camera Club. he Mayor will also invite the officers and members of several cal literary and scientific societies to be present on the casion. By the courtesy of the authorities, every facility ill be given to those members desirous of photographing in e colleges, college grounds, and gardens. The wealth of chitectural subjects in the city, and the beautiful landscape d river scenery in the immediate locality, would alone ake Oxford a most delightful place for photographic work, t in addition to these attractions the council and local com- ittee have arranged for excursions to Warwick, Kenilworth, d Guy's Cliff, and Banbury, Broughton, and Compton- Vynvats; also a river trip by special steamer through Iffley, ndford, Nuneham, Abingdon, Clifton-Hampton, and Day's ock to Dorchester; stopping at the most interesting points route. The President, Sir William J. Herschel, Bart., s invited the members to a garden party at Littlemore on Vednesday afternoon, July 10, and in the evening the annual nner and smoking concert will take place. Several inter- ting papers, demonstrations, and lantern exhibitions have ready been arranged for the evening meetings. Oxford only sixty-three miles from London and is easily accessible om all parts of the kingdom. It may be added that the ficial programme, giving full particulars of excursions, tels, private apartments, dark rooms, dealers, &c., will be sued in due course, and that, in the meanwhile, further rticulars may be obtained of the Hon. Secretary, Mr. F. A. ridge, East Lodge, Dalston-lane, N.E.

* * *

he National hotographic ecord ssociation.

The Honorary Secretary of this Association, Mr. George Scamell, of 21, Avenue-road, Highgate, N., writes: "In order to carry out the object of the Association in a systematic ay, we shall be glad to receive the names of any one willing act as local secretary, and I shall be happy to forward l particulars of the work upon receipt of name. The ondon County Council have promised their support and ill contribute copies of the photographs taken by their der in the London district. The prints already deposited the British Museum, together with those promised, now nount to about 2000." It will be seen that the labours the Association have been productive of successful re- lts. With the hand of change constantly busy in our idst it is not hard to realise that in a few years' time, storical students and others will be glad of the opportunity to inspect the Association's prints in the British Museum. By the way, last week when in Birmingham, a strong photographic record centre, we learned that the municipality had commissioned the Birmingham Photographic Society to take views of such local alterations and improvements as may be necessitated. The prints, which will be officially preserved, will be shown yearly at the Society's Exhibition. The photographic record movement amongst the various societies will, it is to be hoped, be given some impetus by the publication of Mr. Scamell's invitation of co-operation with the central executive.

VARNISHES FOR GELATINE NEGATIVES.

In the article on "Should Negatives be varnished?" (see page 84 ante), we pointed out that gelatine negatives required protection more against moisture and atmospheric influences, than they did from mechanical injury. Since that article was written we have submitted a negative to a very crucial test, simply to illustrate, practically, the protection that varnish affords against moisture, which is one of the most prolific sources of silver staining of the film. A negative was taken and varnished with a shellac varnish. A piece of gelatine paper (P.O.P.) was moistened by drawing it quickly through water, so as not to remove any of the free silver. It was then squeegeed on to the negative to which it adhered firmly, and was then put away where it would dry slowly for twenty-four hours. The plate was then put out of doors to print. While printing, rain came on and wetted the glass; the plate was then turned over and the rain allowed to fall on the paper till it was evenly wetted. It was then taken in and allowed to dry slowly, and kept again for twenty-four hours. By this time the back of the paper was badly stained. The negative was afterwards placed upon a mantel-shelf for some hours, where the paper became thoroughly dry. It then split off the negative just as a finished print does when it is dried on a ferrotype plate, and it had a similar high glaze from the varnish. The negative, as might have been expected, was quite intact, and perfectly free from any trace of staining. It is needless to allude to what would have been the result had an unvarnished negative been submitted to the same treatment.

As we pointed out in the previous article, even a thin resinous coating, such as a retouching medium, affords some protection; still it will be well to consider what is the best protecting medium to employ, and at the same time the most convenient to use. There are several varnishes in the market that are specially made for the purpose and, so far as our experience goes, they are all good and may be relied upon. From time to time, however, other varnishes than those which are specially made for photography have been recommended, and it may be worth while, before going further, to refer to the advantages and disadvantages of a few of them.

In a letter with which Sir Henry Trueman Wood favoured us a fortnight ago (see p. 111), he gives his opinion that a coating of collodion is all that an amateur need give most of his negatives; though he says, if he has one from which a large number of prints are required it had better be varnished. We can endorse Sir Henry's opinion, for we have scores of negatives, many years old, and frequently printed from, that were simply coated with collodion, and they are still intact. Yet, we must confess that we prefer to varnish in all cases. Spirit varnishes do not flow quite so freely

over the gelatine surface as collodion does, and for this reason it is, we surmise, that the latter is so freely employed.

The late Mr. William Bedford adopted the following plan with his negatives. He first coated them with collodion and then varnished them with a lac varnish. This, in our opinion, affords a protection to the film that is unsurpassed by any other that we are aware of. It may be mentioned that when a negative is coated first with collodion the varnish flows much more freely on that than it does on the bare gelatine.

Some dozen years ago, or so, a patent was taken out for a varnish composed of equal parts of pyroxyline and shellac dissolved in a mixture of amyl acetate, methyl alcohol, and turpentine. It was, we believe, really intended for lacquers to be applied cold, but it forms, as we have proved, an excellent varnish for gelatine negatives, as it is hard and very impervious to moisture. Celluloid film, freed from the gelatine and dissolved in amyl acetate, has often been recommended, and it is a good protective; but, to many, the odour of this solvent is very offensive—producing nausea and headache.

Japanese gold size, diluted with turpentine, or benzol, is also highly spoken of, and it forms an excellent protective medium, but it has the drawback that it often takes a long time to dry—sometimes days. By using a highly rectified benzol, however, for the dilution the time of drying is much curtailed. It should be mentioned that the ordinary gold-size, as sold at the oil shops, is a very inconstant article, and different samples sometimes vary considerably.

White hard varnish, diluted with methylated spirit, is advocated by some. It has the advantage of being cheap, and that the surface can easily be rubbed up for retouching upon. The basis of this varnish is sandarac—a somewhat friable resin—and some of the common kinds of this varnish often contain a considerable quantity of colophony—common resin—to give it greater viscosity. That, of course, adds to its friability. If a cheap kind of varnish is sought for we should advise the brown hard instead of the white hard. The base of that is shellac, but this, like the other, is often sophisticated with resin. It has, however, the disadvantage, if disadvantage it is, of giving a somewhat darker film than the other, but, as that is so thin, it makes no material difference in the time of printing, and it yields a much harder surface than the one with the sandarac base, and it is therefore the better able to resist mechanical injury. Whenever either of these two varnishes is employed, they should be obtained from a manufacturer of repute, as those purchased at oil shops are not always of the best quality. Both the above-named varnishes require the negative to be warmed, both before and after their application.

Dammar resin also forms a good varnish, and it has the advantage that it can be applied cold, and the film it yields is quite colourless. It used to be largely employed in the old glass positive days, as a varnish for those pictures. It is, or used to be, employed at the Ordnance Survey Office at Southampton, for varnishing the negatives taken there. Dammar is a somewhat friable resin, but if a good sample of the Batavian be selected, and a highly rectified benzol be used for its solution, a very durable film is secured. About forty grains of the resin to the ounce of benzol is a very good proportion to use.

In the above we have alluded only to the different commercial varnishes that have from time to time been advocated for protecting photographic negatives: though they are not specially made for that purpose, they can only be looked upon somewhat in the light of very good makeshifts. In our opinion there is nothing that surpasses a good hard shellac varnish, properly compounded. In a future article we may deal with lacs and lac varnishes specially adapted for gelatine negatives.

DEATH OF MR. H. P. ROBINSON.

We very much regret to have to announce that Mr. H. P. Robinson died on Thursday, February 21. The deceased gentleman, who was seventy-one years of age, passed away at his residence, Winwood, Tunbridge Wells. Although he had been confined to the house for many months through the effects of a paralytic seizure, his death, which was not unexpected by his immediate relatives and friends, will probably come as a shock to the photographic world generally, for it was only last autumn that some of his photographs were on exhibition in London. Mr. Robinson is survived by a widow and several children, one of the latter being the well-known photographer, Mr. Ralph W. Robinson. To these ladies and gentlemen we are sure that the sympathy of the whole photographic world will be offered in their severe bereavement.

One of the most active careers that British photography has witnessed started in 1852, when, at the age of twenty-two, Mr. Robinson became an amateur photographer, and subsequently went into a studio at Leamington professionally. This was in 1857. A year afterwards, the long series of combination or composition pictures, with which his name was associated, began to make their appearance and aroused the greatest interest in the photographic world. Of these the best known were "Fading away," "Bringing Home the May," "When the Day's Work is Done," "A Merry Tale," "Wayside Gossip," "Day-dreams," "He never Told his Love," "A Chat with the Miller," "Pamela," "The Cuckoo," "Dawn and Sunset," "Carolling." Two distinct branches of work engaged Robinson's attention for exhibition purposes—viz., combination or composition subjects, in which all the constituent elements were photographically pieced together to form the narrative whole; and landscape with figures, illustrative of an incident or story. Of the first class of work, "Dawn and Sunset," produced about sixteen years ago, was probably the most successful; of the other, "Wayside Gossip" and "Carolling" strike the recollection as being conspicuously good examples. In combination or composition work, Rejlander was perhaps Robinson's only serious rival and competitor; in the "landscape with figures" order of production he had the field to himself. For full thirty years Robinson, in the pictorial photography of the time, had an extraordinary vogue, and the influence he exercised on contemporary photographic work was undoubtedly very great.

Mr. Robinson retired from active business as a professional photographer about twelve years ago; but his pen and his camera were seldom idle, and until within the last eighteen months or two years he enjoyed good health. To the Journal for the years 1896 and 1897 he contributed a series of sprightly written "Digressions," which both interested and entertained a wide circle of readers. A prolific contributor to the old "Photographic News" and other periodicals, he was also the author of several books which for years past have had a steady sale amongst photographers. He was joint author with Sir William Abney of "Silver Printing," a useful text-book; whilst at one time his "Picture-making by Photography" and a companion work, "Pictorial Effect in Photography," were popular with those whom he influenced in their work. "The Studio, and what to do in it," was always a very favourite book of reference by professional photographers, and, perhaps, of all Mr. Robinson's literary productions, is the one likely to have the greatest and most abiding practical value. Many other books also owed their authorship to him, and most of them were translated into French and German, and published in America. His style of writing was clear, chatty, and agreeable, and in this department of his photographic work he enjoyed an

paralleled degree of appreciation at the hands of his professional ethren.

A member of the Council of the Photographic Society nearly irty years ago, he subsequently became one of its Vice-Presidents. ast year he was elected an Honorary Fellow of the Society. In 96 he was President of the Leeds Meeting of the Photographic onvention of the United Kingdom. The extinct Solar Club; the ield Club; and the Camera Club also are a few of the many other ocieties to which he belonged at various times. The medal of the hotographic Society fell to him on many occasions, and in 1878 one his photographs at the Paris Exhibition secured the International old Medal. At a period when photographic exhibitions were less equent than they are now, Robinson's success was of constant currence, and between 1860 and 1890, he was probably the cipient of about 100 medals. Judged from the standpoint of the mpeting photographer, Robinson must be allowed to have left mself no more worlds to conquer. In his profession, as an author d as an exhibitor, success and popularity rewarded his efforts, and s reputation was world-wide.

Robinson's exact place in the history of that branch of photo-aphic work with which he was identified has yet to be assigned by competent authority, and his influence on contemporary and suc-eding work correctly estimated. This is a task perhaps best mitted to the future, which may be trusted to yield both the portunity and the man. Looking back over the gulf of years, the adowy but notable personalities of D. O. Hill, O. G. Rejlander, lia Margaret Cameron, now joined by that of H. P. Robinson, and out for recognition; but what existing influences pictorial otography in 1901 owes to each of them who shall say? The st link between the old order of things is snapped by the death of . P. Robinson, whose disappearance we are sure will be regretted photographers all the world over, and by none more sincerely than e writer of this brief notice.

The funeral of the late Mr. Robinson took place on Wednesday st at the Tunbridge Wells Cemetery. Many well-known otographers attended, the Royal Photographic Society, the hotographic Convention of the United Kingdom, and other insti-tions being represented.

THE PHYSIOLOGICAL EFFECTS OF THE MODERN DEVELOPER.

[Translated from the *Mittheilungen der Actien-Gesellschaft für Anilin-fabrikation.*]

WITH regard to the enormous extension of photography, and the nsequent enlarged consumption of developers, it is perhaps as well tabulate experiences as regards the physiological action.

These developers are usually in the form of powders or crystals, hich for use are dissolved in water with the addition of an alkaline lt, and these solutions come into contact with the hands and ngers of persons who use them. Naturally, it is rare that the eveloper, as such, or in solution, gets directly into the stomach, but may be mentioned that some of the developers must be accounted isons, particularly pyrogallic acid. It is of more interest to the otographer to hear of the conditions under which alkaline solu-ons of developers produce harmful effects on the skin in the form of painful exfoliation, which often takes a long time in healing.

Experience shows that only a few individuals possess this special nsibility to these effects. Further, it is undoubtedly certain that ey are as likely to be produced by the alkali in the solution as by e developing substance, and only in one single case, metol, do we now definitely that the reagent produces this inflammation and ritation.

Now there is a great difference in the action of alkalies in the veloping solution. Reagents, like amidol, which assert their power developing with the very weak alkaline reaction of sodium lphite only, can be considered harmless. Up to the present no case irritation is traceable to amidol. The unpleasantness first appears ith the employment of the carbonic alkalies in the developer, *i.e.*, sodium carbonate and potassium carbonate, and it is without doubt those developers which require abundant quantities of these alkalies, such as hydroquinone, that have the most unfortunate results, while those which only require small quantities of these alkalies, such as eikonogen and imogen sulphite, can be classed among the harmless.

With the employment of caustic alkalies the peril is again raised; but here it is as well to understand whether the alkali enters into combination with the developer forming a phenolate, or whether it is contained, as such, in the solution with the reagent.

A characteristic case of the first condition is that of rodinal, in which, as is well known, there is only added such a quantity of a caustic alkali as is just sufficient to conduct the change of paramido-phenol $(C_6H_4\begin{matrix}OH\\NH_2\end{matrix})$ into the phenolate $(C_6H_4\begin{matrix}ONa\\NH_2\end{matrix})$

In this case the corrosive action of the caustic alkali is diminished and the effect on the skin is reduced to a minimum.

Quite the reverse is the case when the developer is not able to absorb the added caustic alkali by the formation of a new salt, as for instance in the case of paraphenylendiamin $(C_6H_4\begin{matrix}NH_2\\NH_2\end{matrix})$ metacarbol, and in this case solutions of this kind react as strong alkalies, and possess the same corrosive action as equivalent solutions of caustic alkalies; continual working with such a developer is not possible.

DR. M. ANDRESEN.

ON THE PREPARATION OF SOME AZO-COMPOUNDS.

SOME two or three years ago I described in the pages of this JOURNAL some of the many dyes and pigments used in photography. In connexion with this subject, the following notes on the preparation of some azo-colouring matters may be of interest. Organic colouring matters are not often prepared in the photographic laboratory, partly because the manipulation involved in their preparation is of a somewhat delicate nature, but chiefly because the chemistry of the process is not generally understood. In the following description it is endeavoured to show how these dyes can be readily prepared in a state of great chemical purity, and also in an exceptionally fine crystalline form; while one of the compounds, viz., *phenyl-azo-naphthol*, possesses more than ordinary interest on account of the uncertainty surrounding its precise nature and properties. Of the other compounds, *methyl orange* and *orange* II., the spectroscopic and other physical and chemical properties are sufficiently well known, so that this paper is confined merely to an easy mode of preparation, and to the chemical reactions involved in the process of their formation.

Helianthine. Methyl Orange.—$C_6H_4\begin{matrix}SO_3Na\\N:N-C_6H_4N(CH_3)_2\end{matrix}$.

Dissolve 10 grammes of dry sulphanilic acid in a solution of 3·5 grammes of dehydrated sodium carbonate in 150 c.c. water. By this means the sodium salt of sulphanilic acid is obtained:—

$$2p-C_6H_4\begin{matrix}SO_3H\\NH_2\end{matrix}+Na_2CO_3=2p-C_6H_4\begin{matrix}SO_3Na\\NH_2\end{matrix}+H_2O+CO_2.$$

To this solution, one of 4·2 grammes of pure sodium nitrite in 20 c.c. water is added, and to this mixture, which is kept cold by the beaker containing it being immersed in cold water (in hot weather, with ice), add hydrochloric acid solution corresponding to 2·5 grammes of anhydrous hydrochloric acid. The sulphanilic acid is thus diazotised by the nitrous acid set free by the action of the hydrochloric acid on the sodium nitrite, the reaction taking place as follows:—

$$p-C_6H_4\begin{matrix}SO_3Na\\NH_2\end{matrix}+NaNO_2+2HCl=p-C_6H_4\begin{matrix}SO_3Na\\N=N-Cl\end{matrix}+NaCl+2H_2O.$$

The mixture must be kept cool, or decomposition of the diazotised sulphanilic acid will take place, nitrogen being evolved thus:—

$$p-C_6H_4\begin{matrix}SO_3Na\\N=N-Cl\end{matrix}+H_2O=p-C_6H_4\begin{matrix}SO_3Na\\OH\end{matrix}+N_2+HCl.$$

The correct quantity of anhydrous hydrochloric acid for the above reaction is readily found by taking the specific gravity of the solution with a hydrometer and consulting a table, such as is found in Bayley's *Chemist's Pocket-book*, p. 191.

Before diazotising the sulphanilic acid, prepare a solution of di-methyl aniline in the theoretical amount of hydrochloric acid. This is done by treating 7 grammes of di-methyl aniline with 25 c.c. of water, and adding with stirring small quantities of concentrated hydrochloric acid until the solution just decolourises fuchsine paper. Litmus paper cannot be used, as on account of the weak basic character of the amine, the hydrochloride gives an acid reaction with blue litmus paper. Fuchsine paper is easily prepared by dissolving a little fuchsine in water, immersing strips of filter paper, and suspending them to dry in some place free from acid fumes. The dried paper should be of a pale rose colour.

The di-methyl aniline hydrochloride thus obtained is added to the solution of diazotised sulphanilic acid, and the mixture is made alkaline by the addition of a caustic soda solution. The dye separates out directly, the reaction being as follows:—

$$p-C_6H_4\begin{cases}SO_3Na\\N=N-Cl\end{cases}+C_6H_5N(CH_3)_2HCl$$
$$=C_6H_4\begin{cases}SO_3Na\\N=N-C_6H_4N(CH_3)_2\end{cases}+2HCl.$$

Some of the dye, however, remains in solution, and this can be salted out by adding 25 grammes of finely powdered sodium chloride to the solution, and stirring well till it is all dissolved. The dye is then filtered off by means of a Buchner funnel on a filter-pump. It is then well pressed out on a porous plate and twice recrystallised from water.

In this way methyl orange is obtained very pure, in most beautiful golden scales, which can be filtered off and dried in the air between filter paper, in some place free from acid fumes.

Phenyl-azo-naphthol.—$C_6H_5N=NC_{10}H_6OH\beta$ is a bright red crystalline substance, not very soluble in water or cold alcohol, but readily so in warm alcohol. It appears to be stable towards acids and alkalies, but its properties are still under investigation. It is very easily prepared from diazotised aniline and β-naphthol.

Ten grammes of aniline are dissolved in 75 c.c. concentrated hydrochloric acid and 75 c.c. of water in a beaker with stirring. The beaker is then surrounded with ice, and a strong solution of sodium nitrite is gradually added, until a test portion shows free nitrous acid by giving a blue stain with starch-potassium-iodide paper. The aniline is thus diazotised:—

$$C_6H_5NH_2HCl+HNO_2=C_6H_5N:NCl+2H_2O.$$

To this is added 15 grammes of β-naphthol dissolved in excess of caustic soda solution, the mixture being kept cool and well stirred, and finally made alkaline with caustic soda solution. The substance separates out at once as a red precipitate:—

$$C_6H_5N:NCl+C_{10}H_7ONa\beta=C_6H_5N:NC_{10}H_6OH\beta+NaCl.$$

The red precipitate is filtered off on a Buchner funnel with a filter-pump, washed with a little cold water, and well pressed out on a porous plate. It is then dissolved in hot alcohol until a strong but not saturated solution is formed. On cooling the alcoholic solution, the phenyl-azo-naphthol separates out in bright red needles, which are filtered off and dried on filter paper.

It was at first thought that the sodium derivative $C_6H_5N:NC_{10}H_6ONa$ was formed, but upon investigation this supposition was found to be incorrect, the formula being $C_6H_5N:NC_{10}H_6OH\beta$. As far as is at present known, it is neither acid nor basic in its properties. In warm alcholic solution it has a fine rich red olour.

Orange II.—$C_6H_4\begin{cases}SO_3Na\\N:N-C_{10}H_6OH\beta\end{cases}$.

This well-known "fast" dye is very easily obtained from diazotised sulphanilic acid and β-naphthol. Ten grammes of sulphanilic acid are diazotised as described in the preparation of methyl orange, and to the solution is added a solution of 8·3 grammes of β-naphthol in excess of caustic soda, and the mixture is made strongly alkaline with caustic soda solution. The reaction is as follows:—

$$p-C_6H_4\begin{cases}SO_3Na\\N:N-Cl\end{cases}+C_{10}H_7ONa=C_6H_4\begin{cases}SO_3Na\\N:N-C_{10}H_6OH\end{cases}+NaCl.$$

As the dye is very soluble in water, but little will be precipitated, only a deep red-coloured solution resulting from the reaction. From this solution the dye is obtained by salting out with sodium chloride. For every 100 c.c. of the solution add 34 grammes of common salt finely powdered, and stir well for some time until all the salt is dissolved. By this process most of the dye will be precipitated as a fine orange-coloured mud, which must be filtered off by means of a Buchner funnel and filter-pump. It should then be washed with a little fairly strong salt solution, and finally with a little alcohol. It is then well pressed out on a porous plate and left to dry, unless it is required very pure. As it is so very soluble in both water and alcohol, it cannot be well crystallised from them, and great loss is entailed by the process. If, however, it is required very pure, it is dissolved in as small a quantity as possible of a mixture of equal parts water and alcohol, boiling. On cooling, a certain proportion will crystallise out in small crystals and in a fairly pure state. The dye can be further purified by repeating the process. This dye gives a splendid orange colour, well known for its "fastness."

On a future occasion I shall hope to be able to give further details of the preparatiou of organic compounds useful in photography, for it is only by this means that the experimental photographer can be certain of the purity of his materials and of the uniformity of their behaviour under special conditions. J. VINCENT ELSDEN.

EXHIBITION OF THE WEST LONDON PHOTOGRAPHIC SOCIETY.

THIS Exhibition was held at the Lecture Hall, Broadway, Hammersmith, on February 22 and 23.

Regretfully, we have to say this year's Exhibition did not impress us as maintaining that steady progression we have hitherto found at the Annual Exhibitions of this Society. We understand that some of the most prominent members have not been active in picture-making during the past year, and that their exhibits at the present Exhibition were not, as one expects to find at a Society Exhibition, the pick of the year's work, but were really from negatives taken in previous years, and, presumably, not used before, because there was better work to represent their authors. This being the case, in at least three instances, the effect on the Exhibition of a Society having a comparatively small number of exhibiting members is naturally a marked one.

We missed, too, in the present Exhibition the exhibits we have usually found here of a class which, in the old Pall Mall Exhibitions, were relegated to that corner known as the "technical section." We by no means deprecate the attention that is now paid to the pictorial applications of photography. If a photograph is intended to have no other interest than a pictorial one, let us have as much art in it as possible. It is creditable to the members of this and many other similar societies that they show so much perseverance in the pursuit of that special knowledge which is necessary in this, as in other, applications of photography; but is it not sometimes misdirected energy? To be able to apply the principles of art is not entirely a matter of training. It is only those who have intuitive perception, or, in other words, natural taste, who can rise beyond mediocrity. There are other directions in which photography may be applied which are as interesting as its pictorial application, and which are as useful, if not more useful, to the community. It should be the duty of every photographic society to encourage a diversity in the character of the work done by the Society as a body, and, as far as the Annual Exhibition is concerned, there can be no doubt that its general interest is much enhanced by the inclusion of a fair proportion of photographs which exemplify the way in which photography may be successfully used in connexion with various arts and sciences.

Among the notable pictures in the Exhibition were those of G. F. Blackmore. We liked particularly a view in the garden of Holland House, which, but for the fact that the foreground appeared to have been worked away in the development of the print, was extremely harmonious in tone. A. E. Cockerell had several praiseworthy pictures. In "Beside the Brook" he had managed to obtain a very fine effect of windy weather. "The Star Inn, Alfriston," an architectural subject, broadly treated, made a pleasing picture. G. M. Cockerell was especially happy in two little interior figure studies. Much of E. T. Holding's work was indirect imitation of some of the American work recently exhibited at the R. P. S. In most cases the less desirable features of the school had been more successfully copied than the excellences. The most successful attempt was a portrait of a lady with an umbrella. A study of silver birches, by F. C. Hart, was harmonious, and, on the whole, pleasing, but the composition was not a strong feature. G. Lamley had, in "Sand Dunes" and "Winter Morning. Barnes Common," acceptable examples of his characteristic style. Harry Selby's one exhibit, "Milking Time," was not in his best form, and Leslie Selby's work, with the exception of "Barnes Common in Winter," indicated relaxed energy in photographic pursuits. The Exhibition was as well organized as usual. The difficulty of insufficient lighting was successfully overcome by fitting the ordi-

nary star gaselier of the schoolroom, temporarily, with Welsbach burners. Want of light is a common complaint where a hall, not specially adapted for the purpose, has to be used for an exhibition, and this method, which need not entail a very serious expense, is commended to the notice of the organizers of exhibitions where the conditions are similar.

EXHIBITION OF THE CROYDON CAMERA CLUB.

THE Fourth Annual Exhibition of the Croydon Camera Club, held at the Art Gallery, Park-lane, Croydon, was opened on the 20th ult. by the Mayor of Croydon.

It has been our pleasing task, during the past three years or so, whenever we have visited the Annual Exhibition of any of our metropolitan photographic societies, to chronicle the fact that the Exhibition then under review showed a general improvement in the quality of the members' work upon that in the previous year's Exhibition. We regret that the present Exhibition obliges us to make a break in what had almost become a custom. The most merciful view of the members' work that we can take is that it showed no improvement upon that of last year. We believe that the members of the Croydon Camera Club show no less enthusiasm in the general work of a Society than of yore. We can testify to the ability with which they conduct their Exhibition; but, as far as the actual work of the camera is concerned, there seems to be, amongst the members, a return to that reliance upon chance and want of intention that we had to deplore so frequently in days gone by. Our views are emphasised by the fact that, in the four Members' Classes for pictures, in each of which a silver and a bronze medal was offered, the Judges (Messrs. Harold Baker and J. H. Gear) withheld three of the silver medals.

In the Members' Landscape, &c., Class, our choice would have been W. H. Rogers's "Reflections," a quaint piece of Flemish or Dutch canal scenery, only wanting a touch of light in the sky. The Judges chose a forest view by E. C. Batty, probably rather for the absence of any aggressively bad qualities than the exhibition of good ones.

The Portraiture (figure and animal studies) Class was noticeable for a number of professional portraits, the style of which we should certainly not commend as worthy of imitation. The medalled picture, a study of sheep, though not unpleasing in the massing of light and shade, was altogether wrong in tone.

The Hand Camera Class, as usual at exhibitions which have continued to include this classification, was an extremely poor one. One medal was withheld; the other should have been. There was nothing commendable about the picture that received it.

The Open Classes contained a very fair proportion of interesting work. "Venice," by Percy Lewis, one of the two pictures which were medalled at the last R. P. S. Exhibition, received the gold medal as the best picture in the Exhibition. W. H. Rogers, a member of the Society, received a silver medal for "A Bit of Holland," a gum bichromate print of considerable merit. Among the contributors were Ralph W. Robinson, J. Page Croft, H. W. Lane, W. E. Dunmore, J. T. French, J. C. Warburg, T. Morley Brook, A. E. Isaac, Graystone Bird, E. G. Bonn, W. Illingworth, J. H. Gash, T. Lee Syms, and C. H. Oakden.

There was a small exhibit of apparatus, &c. A medal was awarded to W. H. Smith, inventor of the well-known Platinotype Co.'s lamp for artificial light portraiture, for an improvement therein. In the improved form a battery of twelve strips of magnesium ribbon is provided in the oxygen cylinder, each of the strips can be successively brought to the front and fired, thus allowing twelve exposures in quick succession, and without recharging the magnesium holder.

In addition to the competitive work, there was a selection of pictures by F. M. Sutcliffe. The Kodak Co. showed some of their enlargements of snap-shots taken by H. C. Shelley, Lady Sarah Wilson, and others at the seat of war, and the Strand Engraving Co. exhibited specimens of photogravure printed in colours. Specimens by the McDonough-Joly process of colour photography were also on view.

We conclude our comments by once more protesting against the unnecessary multiplication of classes. The system is unfair to the exhibitors, the judges, and the public—to the judges especially. In the present case there were eight classes for pictures in each of which two medals were offered. In five of the classes the judges withheld one of the medals, and we have little doubt that it was with extreme reluctance they awarded as many as they did. A casual reader of the award list with "withheld" constantly occurring in it would probably conclude that the Exhibition must have been of very little account. As a matter of fact, notwithstanding our own strictures upon it, and it must be borne in mind that our views are from an esoteric standpoint, it was, as most of our Society shows are, a credit to those who organized it. The recently revised rules and recommendations of the "Conference of Judges" indicate very clearly the best lines to follow. That they are endorsed with the signatures of most of those who are known to have had experience in Exhibition matters should suggest that the principles laid down cannot be departed from with advantage. That this is so receives a confirmation in the Exhibition we have under review.

THE AWARDS.—MEMBERS' CLASSES.

Class A.—Landscape, Seascape, and River Scenery.—Silver medal, withheld; bronze medal, E. C. Batty.

Class B.—Portraiture, Figure Studies, Animals, and Flowers.—Silver medal, withheld; bronze medal, P. H. Ridge.

Class C.—Architecture. — Silver medal, G. W. Jenkins; bronze medal, W. H. Rogers.

Class D.—Hand Camera Work.—Silver medal, withheld; bronze medal, E. C. Batty.

Class E.—Lantern slides.—Silver medal, G. W. Watson; bronze medal, W. H. Rogers.

Novelty Class.—Bronze medal (pencil sharpener), E. Vernon Barker.

OPEN CLASSES.

Gold medal for best picture in all classes.—Percy Lewis.

Class F.—Landscape and Marine.—Silver medal, W. H. Rogers; bronze medal, H. W. Lane.

Class G.—Figure Studies, Animals, and Portraiture.—Silver medal, Ralph W. Robinson; bronze medal, John H. Gash; bronze medal, W. Illingworth.

Class H.—Architecture.—Silver medal, C. H. Oakden; bronze medal, withheld.

Class I.—Any Subject.—Silver medal, Miss M. E. Donaldson; bronze medal, withheld.

Class J.—Lantern Slides.—Silver medal, Frank Gregg; silver medal, Bertram C. Wickison.

Novelty Class.—Bronze medal (Oxy-Mag. Portrait Lamp), W. H. Smith.

THE PAISLEY PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.

THE Fifteenth Annual Exhibition arranged by this Society, which is the Photographic Section of the Paisley Philosophical Institution, was opened last week in the Picture Gallery of the Free Library and Museum.

The Exhibition all over cannot be described as otherwise than an excellent one—highly creditable to the members, and giving abundant evidence of the vitality of the section—and showing to the fullest degree the artistic possibilities of photography.

The quality of the work is in advance of that of any former Exhibition held under the auspices of the Society, and in respect of merit and also in respect of the wide range of subjects and quality it should hold its own alongside that of any larger photographic association. A word should also be said regarding the hanging, which is exceedingly satisfactory, and, while the individual pictures are seen to the best advantage, the general ensemble is very harmonious and effective. The loan collection contains many good examples of photography, and is contributed by Messrs. Kodak, Ltd., Messrs. Lizars (Glasgow), the Warwick Plate Co. (Warwick), Charles Reid (Wishaw), G. L. A. Blair (Paisley), and the Autotype Co. (London). There was a large attendance of ladies and gentlemen on the opening night, thus showing the widespread interest now being taken in the photographic art by the general public.

The Rev. John Crouch opened the Exhibition with a brief and interesting speech, after which the competing lantern slides were thrown on the screen; and Mr. G. S. Bryson, of Pollokshields, Glasgow, gave his evergreen prize lecturette, "Under Venetian Skies," to an attentive audience.

Messrs. A. J. Kay (Glasgow), J. W. Reoch (Glasgow), and James Ness, Artist (Paisley) acted as Judges, and their awards, which are likely to be followed by the majority of spectators, are as follows:—

Class A.—Landscape and Seascape (prizes given by Mr. H. H. Smiley, of Gallowhill.)—First, William Hutchison; second, John Stewart.

Class B.—Architecture (Exterior or Interior) (prizes given by Mr. Smiley, of Gallowhill).—First, Thomas Ralstall.

Class C.—Photographs of Groups (Indoor or Outdoor) (prizes given by Mr. H. H. Smiley, of Gallowhill).—First, Joseph Allison; second, John Stewart.

Class D.—Photographs taken at Outdoor Excursions of the Society.—First, T. H. Taylor.

Class E.—Instantaneous or Hand Camera (prizes given by Mr. Stewart Clark, Honorary President).—First, William Hutchison; second, John Stewart.

Class F.—Enlargements by any process.—First, Thomas Rastall; second, William Hutchison.

Class G.—Lantern Slides (in sets or six).—First, William Hutchison; second, John Stewart; third, David Ure.

Class H.—Photographs of Local Streets and Old Buildings taken during 1900.—First, T. H. Taylor.

Class J.—Photograph of any subject judged apart from its technical merits (prize given by Mr. Robert Cochran).—First, Robert Easton.

Class K.—Photographs not otherwise classified (prize given by Mr. Stewart Clark, Honorary President).—First, John Stewart.

The pictures will remain on view for one month, and admission is free.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF INDIA.

According to "St. Veronica," from which we take the appended list of awards, the Judges—Colonel St. George Gore, R.E., Dr. Geo. Watt, C.I.E., Mr. Arthur Caspersz, M.A., and Mr. George Ewing—after an exhaustive (and exhausting) examination of all the pictures sent, both hung and unhung, made the following awards:—

Special Medal (presented by H.E. the Viceroy) for the best photograph in the Exhibition, awarded to W. T. Greatbatch, F.R.P.S., for No. 19, "The Day's Work Nearly Done" (Class 4, Genre Pictures and Studies).

Class I.—Landscape.—Gold medal presented by H.H. the Maharajah Bahadur of Darbhanga, awarded to Chas. F. Inston, for No. 49, "Wanderers from the Path." Gold medal, presented by H.H. the Maharajah of Tipperah, awarded to Geoffrey Millais, for No. 160, "Morning Mist on the Dahl." The Society's silver medal awarded to James S. Stening, for No. 414, "E'en Shades;" J. Page Croft, for No. 109, "The Last Gleams of Day;" E. J. Garwood, for No. 242, "Siniobehn." Amateur members of the Society.—G. P. Symes Scutt, for No. 343, "Kashmir 1899;" Mrs. Muriel, for No. 353, "Fishing Boats on the Irrawaddy." The Society's bronze medal awarded to F. Kapp and Company, for No. 228, "Ordered to the Transvaal;" John H. Gear, for No. 389, "Autumn;" William Norrie, for No. 42, "By the Silvery Sea;" T. M. Brownrigg, for No. 73, "Abinger Common;" Fritz Kapp, for No. 514, "In the Rains."

Class II.—Architecture and Interiors.—The Society's silver medal, awarded to W. R. Bland, for No. 9, "In Wirksworth Church." Bronze medal awarded to C. Barrow Keene, for No. 1, "A Cottage Stairway."

Class III.—Portraits and Groups.—Gold medal, presented by H.H. Sir Madsihjee, K.C.S.I., Thakore Saheb, of Palitana, awarded to Dudley Hoyt, for No. 6, "A Portrait." Gold medal, presented by H.H. Maharajah Bahadur Sir Jotindro Mohan Tagore, K.C.S.I., for the best photograph by an amateur member of the Society, awarded to Major E. P. Youngerman, I.M.S., for No. 361, "Study of Head." The Society's silver medal, awarded to Alfred Stieglitz, for No. 508, "A Study in oxalate and mercury;" Harrington and Company, for No. 255, "Portrait of a Child." The Society bronze medal, awarded to H. Hands, for No. 512, "Portrait of Bishop Welldon."

Class IV.—Genre Pictures and Studies.—Gold medal presented by H.H. the Nawab Sir Kaje Ahsanullah Khan Bahadur, awarded to R. Eickemeyer, jun., for No. 76, "The Vesper Bell." The Society's silver medal, awarded to C. Kearton, for Nos. 29 and 31, "Blackbird on Nest" and "Waiting for Breakfast;" John Chaffin and Sons, for No. 175, "A Hungry Boy." The Society's bronze medal, awarded to Henry Troth, for No. 25, "Magnolias."

Class V.—Photographs of Objects in Motion.—The Society's bronze medal, awarded to Chas. M. Wane, for No. 521, "Athletic Sports;" James Hewn, for No. 27, "Yacht Archena."

Class VI.—Lantern Slides and Transparencies.—Awards deferred until the Judges had seen the slides in the lantern.

In addition to the above awards, the following exhibits were highly commended:—"The Miller's Workshop," W. T. Greatbatch, F.R.P.S. (7); "The Light of Other Days," R. S. Webster (11); "The Penitent," John E. Dumont (21); "The Ambulatory, Abbeydore," Chas. H. Oakden (38); "For Daily Bread," F. F. Brogden (48); "The Storm Lifting," Chas. F. Inston (57); "O'er Moor and Fen," G. B. Cowen (59); "Calling the Ferryman," John E. Dumont (63); "Grief," C. E. Fairman (84); "The Orchard," W. T. Greatbatch (89); "On the Lago Maggiore," J. Kaufmann (98); "Peaceful Days," E. Cecil Hertslet (142); "Portrait of a Child," Harrington and Company (250); "The Dance," R. Eickemeyer (392); "News from the Front, Absent-minded Beggars, Tatters" (set), Wm. E. Inston (393); "Stone Boats, Lake Geneva," Miss M. Watson (404); "Mine is the lay that lightly floats, and mine are the murmuring dying notes that fall as soft as snow on the sea and melt in the heart as instantly," Ch. M. Wane (412); "Sunset, North Wales," Hubert Palmer (431); "Nave, Aisle, Southwell Minster," A. J. Loughton (457); "Daydreams," J. Page Croft (469); "A Venetian Urchin," A Stieglitz (506).

As one of the Judges (adds Mr. George Ewing) I can only endorse heartily the foregoing awards, and that disqualifies me for ulterior criticism. Perhaps it is as well that it should be so, as, setting aside the medalled and commended photographs, an "appreciation" of the other exhibits would degenerate into a string of ill-natured comments. Taking the Exhibition, however, as a whole, it may safely be said that it is far in advance of its predecessors: and this result is remarkable since the room is not nearly as good as the Exhibition hall of other years, and the general size of the pictures is smaller. Owing to these causes few quite appreciate the fact that there are over a thousand square feet of photographs, and that quality more than compensates for size. I have, I must confess, seldom seen such a good collection of pictorial photographs as those submitted by Messrs. Greatbatch, R. Eickemeyer, A. Steiglitz, C. Inston, C. Kearton, D. Hoyt, Page Croft, Symes Scutt, and Mrs. Muriel. The two last are Indian exhibitors.

THE BIRMINGHAM EXHIBITION.

Outside London few, if any, photographic exhibitions compare in size and interest with that annually held at Birmingham. This week has witnessed the Society's sixteenth display and the third of the series held in the galleries of the Royal Society of Artists, New-street. Setting aside purely scientific matters few photographic tastes of the commoner kinds are left uncatered for. To the lantern-slide Class (open) thirty-one sets of four transparencies were sent in, to the Warwickshire Survey Section, a great feature of activity with the Birmingham Society, no less than a hundred and four photographs are contributed. Those gentlemen who are doing this work deserve the heartiest thanks and encouragement, for the records they are making will one day be highly valued. A set of twelve large transparencies of Royal Palaces and other princely residences is sent by that old time worker, Mr. Horatio Nelson King. We seldom see this class of exhibit in a modern photographic exhibition; but Mr. King may be assured that his excellent pictures on glass created great interest at Birmingham. A hand-camera section produced fifty-seven photographs, and the work of Miss Weiss ("A View of Stonehenge") and T. F. Brogden ("Railway Station during Rain") pleased us by its unconventionality and technical excellence. A Members' Section (B) attracted forty-four examples of beginners' work, of which to our thinking the architectural contributions of Mr. W. A. Clark (Nos. 295 and 296) show the most promise. Mr. Clark has evidently grasped the fact that this kind of subject well repays careful treatment, for his work is full of pictorial quality. The other exhibits in the class encourage the hope that their producers will one day attempt and accomplish less conventional things.

The two main attractions at Birmingham are of course the Members' Section and the Open Section. The 275 photographs in these classes are hung in the principal gallery, a part of which is given up to a loan collection of "pictures (*sic*) by American photographic workers."

These latter productions call for no further notice than they received from us last autumn. With regard to the photographs, shown in the Members' Section, many of the 104 that are hung are of the very highest class. In No. 14, "After the Snow," Mr. W. A. Clark shows a street scene of the "Dear Dirty London" kind, and well suggests the movement and atmosphere of winter.

Mr. Bernard Moore in his interior work carries painstaking care to its highest level, and very good architectural studies are shown by Mr. George Whitehouse (No. 25), and by Mr. Lewis Lloyd, "In the Courtyard, Leicester Hospital, Warwick" (29). A simply treated study of a Girl's Head (34), by two ladies, Mrs. Wootton and Miss Barrows, pleased us greatly, and Messrs. Fred. Slater, W. W. Hollingsworth, and F. A. Bolton, were also prominent with striking portraits of men. No. 53, "In the wood," a bold study of trees with a good effect of broken sunlight by Mr. Charles F. Gore, immediately arrested attention. To this class Mr. J. Page-Croft sends seventeen exhibits not one of which we feel touches the height Mr. Croft is possibly capable of reaching if he were more concentrated in his work. One gets the impression that Mr. Croft makes for quantity and not quality. In each of his exhibits an idea is visible, but he has obviously not allowed himself to make the most of it, and the results therefore fail either to convince or satisfy. To the names of those mentioned that of Mr. A. J. Leeson must be added for a clever *Sand Dunes* (59), an old theme freshly handled. On the whole an interesting class.

Some of the foremost photographic workers of the time are represented in the Open section, which numbers 175 exhibits. Steadily advancing to the very head of pictorial landscape photography, Mr. Greatbatch with a beautiful "Autumn Mists" (149) and "The Orchard" (185) secures the unique distinction of two awards in one class. A careful and painstaking worker, no photograph leaves Mr. Greatbatch's hands that does not show evidence of sympathetic treatment. We think Mr. W. Illingworth's portrait of "An Advocate" (116) marred by the background, a landscape. Advocates do not usually pose in wig and gown against a view of the open country. Of Dr. Grindrod's freely treated field scenes one, "Picking the Last Hops" (402 C) secured an award. We have not met this exhibitor's work before, but it is so striking and wholly without artifice that we hope to see more of it. Notable contributors of landscape and architecture to the class are Messrs. H. Vivian Hyde, F. C. Seary, H. Quilter, and Mrs. M. C. Cottam. For "Strayed" (254) a study of sheep in a snowy ravine, Mr. G. B. Cowen obtained recognition. The photograph is a perfect rendering of a difficult subject.

To our mind the strength of this class consists in its portraits. Nothing for a long time has pleased us so much as Mr. R. S. Webster's "Dans Le Salon" (159), a lady posed before a mirror, with her back to the spectator. In arrangement, lighting, and execution, this strikes us as a signally delicate piece of work, and quite the best thing, in our opinion, that Mr. Webster has done. Another feature of the class is the presence of many lady exhibitors, who contribute some notably good portraits. A portrait group—mother and children (164) and "Portrait of My Husband" (169) show that Mrs. Alice Dumas is as clever at this branch of work as in photographing sunlit landscapes. To Miss May E. M. Donaldson, too, the very highest praise is due for "Evensong," a touching photograph. A young girl at the door of a church is assisting a bowed old man into the sacred edifice. The sentiment of the idea is not strained, and it is well carried. Some more exhibits as clever as this, please, Miss Donaldson! Miss Ella Tomlinson sends "A Study of a Child's Head" (241), reminding us of Mr. Byrne's happiest efforts in this direction; and the little study, "Ida" (244), by Miss Marion Silveston is full of delicate-like qualities.

Separate mention is due to the very able worker, Mr. W. S. Aston, who this year devotes himself exclusively to portrait and figure work, of which he sends

leven examples. He is equally successful in portraits of men and women, ut when he strikes out into the purely imaginative line, his work is, perhaps, ess convincing. "Gwendoline," "Portrait of a Lady," and "Evangeline," are eally strikingly refined in treatment, the decorative backgrounds immensely iding the effect. Mr. Aston has yielded to obvious influences in his portrait tudies, but we hope he will remain under them, for it is a branch of work of vhich the highest capabilities have only been touched by amateur and, for hat matter, professional photographers.

We must congratulate the Birmingham Society upon a most successful Exhibition, and the inclusion amongst its members of some of the ablest photographers of the time. Such workers as Messrs. Greatbatch, Bernard Moore, and W. S. Aston personify the last word in pictorial photography.

The following is the list of awards made by the Judges—Dr. Emerson, Colonel J. Gale, and Mr. S. H. Baker, R.E. :—

Members' Section A.—Silver medal, Chas. F. Gare, "Old College, York" 47); bronze medal, Bernard Moore, "An Old Kitchen" (15); bronze medal, J. L. Robinson, "The Rivals, Nevin, North Wales" (19); bronze medal, G. H. Faux, "Autumn Sunshine" (38); Hon. mention, G. Whitehouse, "By the Pool" (22); Hon. mention, G. Wilkes, "Lynmouth" (48); Hon. mention, F. A. Bolton, "Portrait Study" (89); Hon. mention, G. Whitehouse, "A Summer Evening" (91).

Open Section.—Silver medal, W. T. Greatbatch, "Autumn Mists" (149); silver medal, W. T. Greatbatch, "The Orchard" (185); silver medal, John M. Whitehead, "Still Life Study" (217); silver medal, G. B. Cowen, "Strayed" 254); bronze medal, C. F. Grindrod, "Picking the Last Hops" (402c); Hon. nention, Jas. Burnes, "A Misty Day on the Moor" (270).

Members' Section B (Award made on a set of three).—Silver medal, J. L. Robinson (300, 301, 302); bronze medal, Ernest D. Clark (282, 283, 284); Hon. nention, David Flather (288, 289, 290).

Lantern Slides (Award made on a set of four).—Silver medal, John Gunston 388); silver medal, W. McLean (392); silver medal, W. McLean (393); bronze medal, W. A. Clark (380); bronze medal, Thos. Clarke (382); bronze nedal, Thos. Clarke (383); bronze medal, J. D. Patterson (395); Hon. nention, H. Holt (389).

Hand Camera Section.—Hon. mention, T. F. Brogden, "The Fisher's Return" (345); Hon. mention, T. F. Brogden, "The Artist" (346); Hon. nention, T. F. Brogden, "Slacking out Furnace" (348); Hon. mention, Thos. Clarke, "Seascape" (360); Hon. mention), H. Goode, "Fishing Boats, Douglas" (366); Hon. mention, H. B. Bamford, "A Page of Ancient History" (367).

Our Editorial Table.

IN BIRDLAND WITH FIELD-GLASS AND CAMERA. By Oliver G. Pike. 280 pp., about 90 illustrations.
London: T. Fisher Unwin, Paternoster-square, E.C.

MR. PIKE earns our gratitude by drawing attention to the natural beauties of a tract of country near London which is not so fashionable with the seekers after the picturesque as it deserves to be. The photographer, as well as the student of field life in its varied forms, may find unlimited opportunities for observation and work round about Winchmore Hill, Old Southgate, Enfield, and the south-eastern portions of Herts which lie within ten or eleven miles of King's Cross. We have cycled, photographed, and walked in the district at intervals since 1873, and, as we turn over Mr. Pike's pages, they recall to us some rustic scenes and experiences which we should be just as unwilling to forget if they had come to us 100 miles from London instead of only ten. But to Mr. Pike's book. The preface gives some simple hints as to the procedure to be adopted in photographing birds in their native haunts. Frankly, we think Mr. Pike has not done himself the fullest justice by his photographs, many of which lack those qualities of definition and correctness of exposure which are essential in this class of work. We by no means wish to underrate the difficulties of bird photography—practical experience has taught us that successful results are not very easily obtained—but we cannot help feeling that Mr. Pike's bird photographs suffer considerably by comparison with some similar illustrations in recently published books that treat of bird life. Many of the reproductions give us the impression that the original negatives might have been improved by diaphragming down the lens and compensating for the longer exposure necessitated by the use of more rapid plates. Still it is fair to Mr. Pike to suppose that this opinion of his photographs will not be generally felt. The book as such is a distinctly welcome addition to the library of the student of bird life. The records of his wanderings in Middlesex, Herts, and Norfolk—is not the latter county getting slightly overdone in this respect?—are sympathetically written, and, if we miss the exultant note of hair's-breadth escapes and rare "finds" that usually appears in such books, we are charmed, in compensation, by the evident sympathy with which Mr. Pike has addressed himself to his task. We welcome "In Birdland" as a stimulating addition to the records of a branch of photography which appeals to all nature lovers, and is deserving of greater attention at the hands of camera workers.

THE CRISTOID FILM AND THE DUPLEX FILM SLIDE.
Sandell Plates and Films, Ltd., South Norwood, S.E.

WE had an opportunity, during the past week, of having a complete demonstration of the working of the Cristoid film, and of investigating its constitution and properties. The Cristoid film may be described as a gelatine plate without the glass. It is made by coating glass with an emulsion of a slow character, and, after drying in the usual way, the first coating is further coated with a more rapid emulsion. The double layer of emulsion is then stripped from the glass, and forms a perfectly flat film, not very easily distinguishable from a rollable celluloid film, except that it possesses a greater degree of opacity, consisting, as it does, entirely of emulsion. The film is supplied in cut sizes, and also in spools, with black paper ends for use in a daylight changing roll-holder, and every method of using films is applicable to the Cristoid film. We were satisfied that whatever virtues these may be in a double-coated plate exist equally in this film, with the additional advantage that it can be used as rapid or slow, according to which side is presented to the lens. We witnessed the exposure and took part in the development of a spool of film equivalent to six 12×10 plates. The light was hopelessly bad, and we may say here that the resulting negatives turned out to be quite as well as we should have expected under the circumstances. After the exposure we retired to the dark room. After cutting the black paper ends from the strip of film, the film was immersed in a weak, that is one per cent., bath of formaline. After two or three minutes had elapsed we handled the film. It was tough and extremely elastic. It seemed to us exactly like a sheet of indiarubber of the same thickness. Naturally we handled it somewhat tenderly, but Mr. Sandell boldly gathered it up, wrung it out just as a laundress ought to, regretfully we say does not, treat a pocket-handkerchief in the wash, and pitched it into a dish of water. We may here say that, subsequently, the same film was ruthlessly rolled into a ball and violently flung against the wall, and yet it escaped unscathed. The development was effected in a dish about 18×16, with not a very large amount of solution, and here the film, which was 60 inches long by 12 wide, it must be remembered, was manipulated with the greatest ease. When development was complete it was removed to a dish of water to rinse, and then fixed. During these operations the film enlarges equally in all directions, about 25 per cent. in each diameter. After washing to remove the hypo, it may be dried retaining this enlargement, or may be reduced to its original dimensions in a bath of methylated spirit. The final operation consists in squeegeeing the film to a sheet of glass, from which, when dry, it is stripped. The finished films we were shown were perfectly flat, and without a trace of cockling. They are equally available for printing from either side.

The Duplex film slide is an ingeniously constructed piece of apparatus to replace the ordinary double dark slide. Each slide takes two exposures, and is about a quarter of an inch in thickness, and correspondingly light in weight. The film for use with it is of double length, and folded in its middle. An ebonite diaphragm is placed between the folded film and inserted in the end of the slide, where it is held in position by a pin. A specially made reversing back is required to the camera which allows of the outer case of the slide being withdrawn, thus exposing the film to the rays from the lens.

Studio Gossip.

QUEEN VICTORIA and a Copyright Case.—Mr. A. C. Pirie's gift of eleven etchings, made by Queen Victoria and the Prince Consort, to the City of Aberdeen, says a writer in the "Daily Chronicle," recalls a rather curious copyright case tried in 1848. The Queen and her husband had, at that time, gone through a course of lessons in draftsmanship upon copper, their instructor being Mr. Thomas Landseer, the brother of Sir Edwin. They made about eighty plates, the subjects of them being, as might be supposed, chiefly domestic. The Princess Royal in her nurse's arms, and the baby Prince of Wales had been favourite subjects. The Queen's dogs, too, were frequent models. Sir Edwin Landseer's works were copied, and so forth. Some of these etchings were given away to this person and that, changing hands with the passing of years, as Aberdeen now knows to its advantage. But some sets of the complete collection of plates, not given away, got on to the market. A journeyman employed by a lithographer in Windsor, to whom the Queen and the Prince Consort sent the plates to have impressions printed, was supposed to be the delinquent. Anyway, one morning the Royal amateurs, whose handiwork it would have been cruel to publish as if it challenged serious criticism, woke up to read the announcement that a Paternoster-row firm was about to publish reproductions of their eighty etchings. The publisher was a courtier born, for he took from Shakespeare a flattering motto for his prospectus: "England must know the value of her own; 'twas a concealment worse than a theft," &c. To no purpose, however. An injunction against the publication was asked for and granted. The "concealment" that is "worse than a theft" is maintained, except so far as Aberdeen has been dissociated from the rest of the United Kingdom by the gift of Mr. Pirie.

THE Genesis of Art.—In the course of a review of Hirn's "Origin of Art" in "Nature" of February 21, Professor Alfred Haddon remarks that

"Despite the generally received dictum of 'art for art's sake' it will often be found, especially among primitive folk, that some form of interest, personal, political, ethical or religious, enters into what is regarded as disinterested æsthetic activity. In almost every case where the ornaments of a tribe have been closely examined, it has appeared that what seems to us a mere embellishment is for the natives full of practical, non-æsthetic significance, such as religious symbols, owners' marks, or ideograms, and it is surprising what religious or magical significance lies concealed behind the most apparently trivial of amusements. The dances, poems, and even the formative arts of the lower races possess unquestionable æsthetic value; but this art has generally utility, and is often even a necessity of life. While supplying man with a means of intensifying all his varied feelings, art at the same time bestows upon him that inward calm in which all strong emotions find their relief. It is very difficult for an individual to resist the contagion of collective feeling, and all strong feelings act as socialising factors. A work of art is the most effective means by which the individual is enabled to convey to wider and wider circles of sympathisers an emotional state similar to that by which he is himself dominated. The art impulse, in its broadest sense, must be taken as an outcome of the natural tendency of every state of feeling to manifest itself externally, the effect of such a manifestation being to heighten the pleasure and relieve the pain. Every man seeks automatically to heighten his feelings of pleasure and to relieve his feelings of pain. The artist is the man who finds that he can gain such enhancement or relief, not only by the direct action of giving expression to his feeling, but also by arousing a kindred feeling in others. Hence originates in him that desire to transmit his moods to an external audience, and there also arises the endeavour to give the artistic product a form which may facilitate the revival of the original state in an ever-widening circle of sympathisers."

The Abuse of Public Advertising.—Referring to the meeting held last week in support of the objects of the Society for checking the abuses of public advertising, the "Daily Telegraph" reminds us that Wordsworth was moved to unwonted heat by the thought of the pedantic materialist who would "peep and botanise upon his mother's grave." The botanical employment would be secluded, however reprehensible. But what shall be said of the Philistine enterprise which devotes itself to the creation of ugly and incongruous things in beautiful and hallowed places? The most famous spot is that which it is most desirable to profane. Poetic thoughts are interrupted at every turn with the claims of patent medicines. We are met at our holiday haunts by lugubrious intimations of mortality. The exhilarated spirit cannot get away from the assertions made on behalf of articles of diet, chiefly of a solid nature, and by no means "too bright or good for human nature's daily food," while even the undoubted merits of cleanliness may be declared with a ubiquitous importunity that ceases to remind us of the next association. The case which last week occupied the "National Society for Checking the Abuses of Public Advertising" was that of Dover. Here, practically, we have Shakespeare's Cliff regarded by the powerful inspiration of a Chicago firm as a natural hoarding. Huge posters have duly appeared proclaiming the eminent qualities of somebody's special line of nourishment, and forming a signal feature of Dover Bay. Private expostulations, urged with the most æsthetic fervour, were unavailing to ensure the removal of the monster boards. The question was agitated in an indignant British Press, but Chicago remained practical and serene. Dover Town Council made a unanimous appeal for the withdrawal of a nuisance which is a serious injury to the ancient borough, whose historic and picturesque associations are remorselessly vulgarised. But the Corporation pleaded in vain, and it has now been driven, in default of general powers, to the expense of promoting a private Bill in order to compel the suppression of the offence. So far the American firm have been proof against the sound argument of a deputation of advertising agents that the Dover audacity ought to be withdrawn, if only "in the interests of trade." The case for legislation, as it happens, is made unanswerable by the precedent of Chicago itself. What has been done to spoil the old Cinque Port, for so many centuries the gate of the land, could not have been attempted by the American firm in the very city of sky-scrapers and sky-signs. It is forbidden to mar the beauty of Chicago, since a measure introduced by one of its aldermen, and adopted unanimously, provided, without any of the superfluous verbiage of our old-world procedure, that "all sign-boards and bill-boards more than three feet square now within two hundred feet of any park, boulevard, or driveway be declared a public nuisance, and torn down, and that such boards be prohibited in future." The Imperial Parliament might well take a leaf at that point out of the municipal book of Chicago. The London County Council rates advertising stands, and all hoardings are subject in France to a Government tax. Mr. Bryce recommends the example to Sir Michael Hicks-Beach. We do not agree with the National Society that wall-posters in towns should be regulated by æsthetic considerations. Street advertisements exist for commercial purposes among more or less commercial surroundings. It is when beautiful and historic scenes of national interest are subjected to organized desecration that public interference becomes imperative. "'Twixt harmonies divine and chords that hold stupendous discords lie but semitones." At places like Dover or Stratford-on-Avon the intrusion of a single note of grotesque vulgarism makes the whole difference.

News and Notes.

Royal Photographic Society Lantern Meeting, Tuesday, March 5, at 8 p.m., at 66, Russell-square. Mr. W. B. Ferguson will give an illustrated lecture on "Rome."

The Brentford Exhibition.—We are asked to state that all entry for for this exhibition should reach the Hon. Secretary by March 8.

The Sixth Annual Bohemian Concert, organized by the employés Jonathan Fallowfield, was held on the evening of Friday last, Februa 22, in the St. George's Hall, Champion Hotel, Aldersgate-street, E. under the Presidency of Mr. F. W. Hindley, with Mr. J. B. Craig in t vice-chair. As usual a capital programme was provided, and the arrang ments made by the committee were admirable. A very pleasant evenu was spent; and amongst the visitors supporting the chairman were Mess S. H. Fry, J. Howson, A. Mackie, E. G. Platt, P. R. Salmon, A. Staley, H. Snowden Ward, and C. Winter.

The Rontgen Society's next ordinary general meeting will be held Thursday, March 7, 1901, at 20, Hanover-square. The chair will be tak at 8 p.m. This is to be an exhibition evening. Smoking will be pe mitted. Tea and coffee will be provided. Only such apparatus c be exhibited as possesses some special novelty, and has not been pr viously shown to the Society. A lantern will be provided, and membe are invited to bring slides of interest, a maximum of twelve slides f any individual member being the limit. Skiagrams, negatives, and a objects of interest will be welcomed. Dr. Batten and Mr. Sutton w show a new rectifier for transforming alternating currents into direct cu rents. Dr. E. Reginald Morton will show a rectifier for the same purpos Mr. Bowron will show a fifteen-inch spark semi-portable coil with hedg hog core. Mr. Isenthal will show a coil of entirely new design. M Cox will show a regenerating tube of new design. Mr. A. E. Dean wi show a new ward outfit. Mr. E. W. H. Shenton, M.R.C.S., L.R.C.P will show a set of normal skiagrams.

Commercial & Legal Intelligence

Messrs George Mason and Co., of 120-124, Buchanan-street, Glasgow announce a stock-taking sale, to continue for two weeks from February 2

A Souvenir of the Proclamation of King Edward VII., at Salisbury issued by the "Salisbury Times" Company, is illustrated from photo graphs taken by Mr. H. C. Messer, Photographer, of 32, Castle-street Salisbury. Mr. Messer did his part of the work admirably.

Stonehouse Camera Club.—At the last weekly meeting of this Club Sergeant Paynter, R.M.L.I., the Hon. Secretary, gave a demonstratio on "Platinotype Printing." He showed how easy it was, with ordinar care, to obtain by this process prints which, for their beautiful an lasting qualities, were not to be beaten by those obtained by any othe process. Amongst other prints developed, were some sent by th Platinotype Company of London, which, on being passed round afte development, were much admired.

The 1901 Calendar issued by Mr. S. H. Fry, of 12, South Villas, Camden square, N.W., has not yet been noticed in our pages. It is not too lat to draw attention to it, inasmuch as there remain just ten months o the year in which its uses as a date reminder may be availed of. An there is its pictorial embellishment, the charm of which is certain t outlive the utility of the card. This is an excellent little photograph i carbon, entitled "When Adam Delved." Adam, in this case, is a sma and curly haired child, thrusting his spade into the sunlit sand. The pho tograph is wholly pleasing, and Mr. Fry may be credited with knowin how to make his Calendar generally attractive.

Retouching Lessons by Post.—Mr. T. S. Bruce, of 4, Villas-on-Heath The Vale, Hampstead, N.W. writes: "Some few weeks ago I noticed i your Answers to Correspondents, you replied to a query as to the efficac of postal lessons in retouching, that you considered they were not of muc value, and you advised the correspondent to take the lessons from som local retoucher. I have been most successful in giving postal instructio in retouching, both with amateurs and professional retouchers and photo graphic assistants, and have very many perfectly glowing testimonial as to their efficacy, many being quite astonished at the result of the lessons, for, like yourself, they had entered upon the course in fear and trembling, as their friends had invariably told them that postal lessons were useless. My postal lessons are practical, and not mere theory. I send the actual negatives in batches, show the actual work on them, for ward specimens of the art, describe every known touch most minutely, and severely criticise the efforts of each individual pupil during the course of six or more lessons. Each lesson is accompanied by, on an average, six sheets (this size) of type-written instructions and criticism, and each lesson is entirely an impromptu directed solely to the individual efforts of the pupil I am writing to. I do the retouching necessary myself, and in the course of six lessons about thirty negatives are sent to the pupil, as well as those which he may be able to work on belonging to himself, and as per advice given. I have no ready printed lessons that can be just stuck into an envelope, and that may be made to fit one and all, for that would not be fair, but each, as I have stated before, is written for the pupil I have in hand, and takes me about two hours' hard work to give. Under my system a man or woman must make progress, unless they are perfect fools, and I have not met with any yet, for though some are sharper than others, the majority make excellent progress." Mr. Bruce encloses us four original testimonials, which speak very highly of his success as a teacher of retouching by post. We have much pleasure in making known his abilities in this important branch of photographic tuition.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
.....	Bognor	Demonstration: *The Carbon Process.* Rev. H. Mudie Draper.
.....	Bradford Photo. Society	*Airedale, from Goole to Malham.* W. H. Hainsworth.
.....	Camera Club	Members' Lantern Slide Evening.
.....	Doncaster	*Enlarging by Daylight.* W. S. Yates.
.....	Glasgow and West of Scotland .	Demonstrations: *Carbon Printing,* W. J. B. Halley; *Ozotype,* J. W. Downs
.....	Gospel Oak	Exhibition and Criticism of Members' Prints.
.....	Rotherham	*Some Typical Subjects and their Treatment.* A. Horsley Hinton.
.....	Edinburgh Photo. Society	*The Hand Camera and its Capabilities.* J. B. Johnston.
.....	G.E.R. Mechanics Institution...	*Exposure.* Mr. Bennett.
.....	Woodford	*The Perfect Negative.* E. Marriage, F.R.P.S.
.....	Camera Club	*Light and Shade.* A. Burchett.
.....	Hull	*How to produce Large Pictures.* A. G. Peck.
.....	Leigh	*Narrow and Wide Angle Lenses and Subjects.* W. E. Debenham.
.....	Liverpool Amateur	Demonstration: *Platinotype Printing and Development.* Joseph Appleby.
.....	London and Provincial	*Society Demonstrations.* Walter D. Welford.
.....	Manchester Amateur	*Foregrounds.* G. E. Mellor.
.....	Aberdeen	*Optics and the Photographic Lens.* G. Jamieson, M.R.P.S.
.....	Croydon Microscopical	*Pictorial Lantern Slides.* J. A. Hodges.
....	Newcastle-on-Tyne	Prize Slides.
.....	West London	Lantern Night: *A Cruise on a Man-of-War.* A. C. Beard.

ROYAL PHOTOGRAPHIC SOCIETY.

EBRUARY 26,—Technical Meeting,—Major-General J. Waterhouse, I.S.C. Vice-President), in the chair.

The Chairman announced that the Council had that evening made the follow- g appointments:—*Hon. Librarian:* Mr. Horace Wilmer. *Hon. Solicitor:* r. Francis Ince. *Hon. Editor of the Journal:* Sir W. de W. Abney, K.C.B. *on. Secretary:* Mr. John A. Hodges. *Affiliation Delegates:* Messrs. John . Hodges, H. Vivian Hyde, and Alexander Mackie. To fill the vacancy used upon the Council by the re-appointment of Mr. Hodges as Hon. ecretary, Mr. J. J. Vezey had been elected an ordinary member of Council.

The Chairman referred in appropriate terms to the death of Mr. H. P. obinson, which took place on Thursday, February 21, at the age of seventy- ne years. Mr. Robinson became a member of the Society in 1857, a member its Council in 1869, Vice-President in 1887, and was elected to the Honorary ellowship in 1900, in recognition of all that he had done for photography and r the Society itself during so many years' connexion with it. The Council id delegated Mr. John Spiller to represent the Society at the funeral on ednesday, February 27, and to place a wreath upon the grave. The Chair- an felt sure that the Society would desire to associate itself with the vote of ndolence with the deceased gentleman's family that had been decided upon the Council.

It was announced that the following gentlemen had been appointed to act as e Pictorial and Technical Selection and Hanging Committees at the forth- ming Exhibition, the two Committees together forming the Organizing ommittee:—*Pictorial Section:* Messrs. P. H. Emerson, B.A., M.B., Charles ob, A. Mackie, Charles Moss, J. C. S. Mummery, W. Thomas, and J. B. B. ellington. *Technical Sections:* F. A. Bridge, Chapman Jones, E. Sanger hepherd, J. J. Vezey, E. J. Wall, and Major-General J. Waterhouse, I.S.C.

A hearty vote of thanks was passed to the Rev. C. J. Moncrieff Smyth, who id presented the Society with a framed copy of his photograph of *St. illiam's Hostel, York,* a picture that many will remember to have seen in he 1899 and last Pall Mall show.

Through illness, the paper "Notes upon Five Years' Work with X Rays," y Mr. William Webster, had to be postponed at the last moment.

A Spectroscope Slit for Photographic Work.

Mr. Chapman Jones showed and described a new spectroscope slit for photo- aphic work. The advantage of a slit having fixed jaws over one with adjust- le jaws was analogous, he said, to the advantage of a Waterhouse diaphragm er an iris diaphragm—there is no mechanism to become deranged, and no certainty about the aperture. The disadvantage of the fixed jaws slit, how- er, is, of course, the fact that only one width of slit is available. This is ercome in the new piece of apparatus by the adoption of a series of slits, on a movable support, of the following widths: ·5, 1, 2, 4, and 8 hundredths a millimetre.

In reply to Mr. F. C. Lambert, the last speaker said that the measurement small quantities and the accurate adjustment of the slits to a required width, ere wrongly regarded with awe by very many people. With delicacy of anipulation there was not a suspicion of difficulty. It was very important at the jaws of the slit should be straight. It was merely a question of inding true faces to them, and this he did on plate glass, preferably to stone. e ground his own plate glass with the finest emery, and the grinding of the etal was done on such a surface.

The Chairman, speaking from experience, confirmed Mr. Chapman Jones garding the importance of getting a perfectly true slit. He anticipated that e device shown by Mr. Jones would be of great help to those using the spectroscope in photographic research, and desirous of having a variety of widths quickly at hand.

Mr. Charles P. Butler, A.R.C.S., showed a reproduction of one of

Rowland's Concave Gratings,

made by Mr. Thorpe, of Manchester. This gentleman had been very successful with his method of copying plane gratings, and the example shown was one of the first of his attempts to produce a copy of a concave grating. The plane gratings had, of course, to be used with a collimator and observing lens just as would a prism, but the concave grating was found to dispense with these adjuncts, and all one wanted to to form an effective spectroscope was a slit and the concave grating, which forms its own image. Mr. Butler alluded to the considerable cost of the original gratings, due to the extreme delicacy required in the ruling machine and the great care necessary during the operation of ruling. The slightest variation of temperature was sufficient to upset the whole spacing and ruin the thing. The possibility of taking copies of these concave gratings meant a great advance. Mr. Thorpe took the original grating on metal, and poured over it a special solution of celluloid in acetone. When set this film was stripped off and mounted on a glass surface, previously properly ground to the proper curve. The result of Mr. Thorpe's success is that many who have work to do in spectroscopic research can now indulge themselves, without the previous heavy outlay necessitated by the original gratings so laboriously and expensively produced. Mr. Butler, later in the evening, showed by means of an improvised apparatus the arc spectrum of iron, and explained the uses of the grating.

Measuring Instruments.

Mr. J. H. Agar Baugh, one of whose hobbies is the acquisition and use of measuring instruments of precision, showed one or two things in this category. The first was a flat, folding metal measure, divided in the French and English systems with very considerable accuracy for so cheap an article. It was made by Chesterman. Another device which, with a vernier, measured to the hundredth part of an inch, was suited for the measurement of very many things, including the inside and outside diameters of tubes, flanges, &c. It was of a remarkable degree of accuracy, a pocket magnifier failing to detect any errors. A more elaborate instrument of a similar character, fitted with a vernier and micrometer screw was also shown.

Reflection and Refraction.

The Rev. F. C. Lambert showed a cardboard model demonstrating the principles of reflection and refraction. A green strip of card was made to represent the incident ray of light passing from air into another medium—water or glass for instance. A strip of another colour took the place of the reflected ray from the surface of the water, and a third strip played the rôle of the refracted ray. The three strips were so pivoted and connected with an actuating lever, that any alteration of the angle of the incident ray at once made itself felt in the reflected and refracted rays.

He then described some experiments he had made to ascertain how much light passed through a plate upon exposure, in connection with some ideas about halation. Two plates were placed film to film, in the camera, and an exposure was made through the glass of the foremost plate, through the film, and thence on to the film of the second plate. The two were then developed, and he found that a good deal more action had taken place on the second plate than he should have expected. The results were passed round, and they were very striking. Mr. Lambert's experiments were not complete, but he was of course striving to keep the light that affected the back plate, in the first plate, and so get the maximum action of the light available. The question had a practical value in instantaneous photography he thought.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Feb. 21.—Mr. C. J. Burchall in the chair.

This was a lantern evening, Mr. J. K. Grant showed a series of slides from negatives taken at the last year's Convention at Newcastle; giving an interesting description of the scenes and subjects illustrated, and technical particulars of the production of the negatives.

Mr. J. W. Hodges showed a series of slides, also illustrating the places visited by the Convention.

The next series was by Mr. H. E. Davis, the subjects being rural scenery near London.

Mr. H. C. Rapson showed snow pictures from negatives taken this winter.

Mr. T. E. Freshwater also showed snow scenes taken at the same period, and a number of slides, partly from original negatives and partly from wash drawings of episodes in the Queen's funeral.

The concluding series was by Mr. L. Medland, illustrating life at Barnet Fair; there were also a number of zoological subjects.

Borough Polytechnic Photographic Society. — Gothic architecture in England was dealt with in an interesting lecture by Mr. A. Bedding at this Society last week. Some 120 slides were shown illustrating the growth and advancement from the rude Saxon, through Norman, Early English, Decorated, Perpendicular, to the classic and picturesque style of the Renaissance. Following some good examples of Saxon work, the lecturer showed the early rough work of the Norman period before about 1110, when the chisel gradually superseded the axe—it was then that carvings, mouldings, &c., became much finer and bolder, ornaments zigzag, beak-head, cone, &c., windows and doors semi-circular (the latter deeply recessed), pillars massive with cushioned capitals, whilst late in the period we get interlaced arcading. transitional work leading to Early English. During the Early English period (1189 to 1307), the appearance of buildings became greatly altered with the increased use of the pointed arch, columns were more slender

and surrounded by detached outer columns, zigzag ornaments gave place to the dog tooth, buttresses were bolder, and the height of buildings generally increased. Lancet windows and broach spires were also introduced in this period, whilst wooden roofs to nave gave way to stone vaults with groined and transverse and diagonal ribs with carved brasses. The principal features of the Decorative period (1307 to 1378) are vaulting with more ribs, greater richness of ornament, larger clerestory, smaller treforium, and loftier towers, whilst the broach spire disappears and gives place to, or is hidden by parapets and pinnacles. Other distinctions of this style are battlemented windows divided by mullions, geometrical tracery, and later flowing, flatter roofs, floral ornaments, and elaborate and beautiful tombs. Very few new buildings were erected in the Perpendicular period (1378 to 1546), but many important alterations were made to existing ones. Mullions were run right up to the heads of windows, thus giving strength so that window space was much increased. Wall space continued to decrease and outward pressure of windows, vaults and arches became so great that buttresses grew bigger and stronger, and had to be helped by flying buttresses and pinnacles. Here the builders took advantage of these building necessities to make their buildings more beautiful by carvings and mouldings, and spires gave place to increased height of towers, beautifully decorated as the style advanced. Examples were shown throughout the lecture from Durham, Ely, Peterborough, Norwich, Chichester, Winchester, St. Albans, St. Bartholomew's, Westminster, and later buildings; but Mr. Bedding pointed out that there was no necessity to go beyond London, as ample material was to be found at St. Bartholomew's, St. Saviour's, the Abbey, and other places.

Hackney Photographic y.—February 19, 1901.—Mr. F. W. Gosling presiding.—The chief item of business at this meeting was a paper and demonstration on "Enlarging," by Mr. W. L. Barker. After describing fully the different methods of enlarging, he demonstrated the method by projection with incandescent gaslight and a condenser. Enlargements were made on Barnet bromide paper, and also on the Rotograph paper, with very satisfactory results. The paper and demonstration were so complete that no time was left for discussion, so that the same was postponed until the next meeting.

Southsea Amateur Photographic Society.—The Annual General Meeting of this Society was held on Monday last, the President, Mr. H. T. Lilley, M.A., in the chair. The councils report of the work of the past year showed that the membership had increased, whilst several candidates waited election. Great interest continued to be shown in the work of the Society, and the recent exhibition was evidence of the improvement which had been made in the work of the members. The ladies section had met with a fair measure of support, though not so great as was anticipated, and a more successful innovation had been the opening of the rooms in Pembroke-road—the Society's headquarters—on two nights a week, in addition to the regular meeting night, Wednesday, which afforded members an opportunity of meeting informally, and conduced to good fellowship. The Treasurer's Statement showed that the Society was thoroughly solvent, and that the fresh year would be started with a sufficient balance in hand to ensure several further improvements to the rooms being effected. The recent exhibition had been artistically a great success, and the open classes included many admirable examples of work by well-known exhibitors. The officers for the ensuing year were elected as follows: President, Dr. C. H. Newby, F.R.C.S.; Vice-President, Mr. W. G. Lewis; Treasurer, Mr. H. A. Canning; Council, Mr. H. T. Lilley, M.A., Mr. G. Stanford, Mr. J. H. Franckeiss, Mr. A. Fisher, A.S.A., Mr. G. Wood, and Dr. F. Lord; Hon. Lanternist, Mr. E. H. Purvis; Hon. Secretary, Mr. F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth; Assistant Hon. Secretary, Mr. F. Field. The hour of meeting was altered from 9 to 8.30 p.m., on those evenings when lectures are read or demonstrations given.

Wolverhampton Photographic Club.—The first meeting of this Club was held at the club-room, No. 2 Exchange-street, on Wednesday evening, February 20, and had a highly gratifying send-off. A large number of ladies and gentlemen attended, and eighteen at once became members.—The Chairman (Mr. B. Williams) briefly explained the objects of the Club, which were to provide lantern exhibition demonstrations and excursions, with the use of the club-room, containing photographic publications, and an elaborately fitted out dark-room, open for the free use of members on Mondays, Tuesdays, and Saturdays. There is also an enlarging lantern provided for the use of members. The subscription is a low one, payable monthly. Councillor W. Shepherd was appointed President, Mr. B. Williams, Hon. Secretary, Mr. B. F. Williams, jun., Hon. Treasurer, and a committee of nine ladies and gentlemen. The meeting to consider and revise rules was fixed for Wednesday, 27th inst., at 8 p.m. Any photographer, especially beginners, interested, can obtain full particulars by applying to the Hon. Secretary, 2, Exchange-street.

Blairgowrie and District Photographic Association.—The Annual General Meeting of this Association was held in the Club Room, Blairgowrie, on Tuesday evening, Mr. John B. Maclachlan, Vice-President, in the chair. The balance-sheet of the recent examination was submitted by Mr. D. G. Monair, and showed a small credit balance. The Secretary's report of the season's work, and the Treasurer's financial statement were also submitted and considered satisfactory. Office-bearers for the season were elected as follows: President Mr. Alex. Geekie; Vice-Presidents, Messrs. John B. Machlashlan and Jas. Richardson; Hon. Secretary, Mr. H. B. Jamieson; Hon. Treasurer, Mr. John Cameron; Hon. Lanternist, Mr. H. S. Fyffe; Executive, Messrs. D. G. Monair, Alex. Mitchell, J. W. Petrie, Jas. Donaldson, and W. D. M. Falconer. The chairman intimated the presentation to the permanent collection, of a famous copy of "Martha," from the artist, Mr. Alex. Allan, Edinburgh; the Secretary was instructed to transmit to Mr. Allan the hearty thanks of the Association. Mr. D. G. Monair was announced as the winner of the "Macgregor" championship medal, adjudicated on the season's competition. Mr. Monair is a most enthusiastic and hard-working member, and well deserved his win.

FORTHCOMING EXHIBITIONS.

1901.

March 1, 2 ..... Birmingham Photographic Society. Hon. Secretary, H. Vooght Cornish, Athletic Institute, John Bright-street, Birmingham.

,, 1–9 ..... Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.

,, 2–9 ..... South London Photographic Society. Hon. Secretary, Frank Goddard, Vanbrugh Hill, Blackheath, S.E.

,, 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Patent News.

THE following applications for Patents were made between February 11 and February 16, 1901:—

COPYING PRESSES.—No. 2997. "Improvements in and connected with Photographic Copying Presses." Complete specification. GEORG GERLACH.

FLASH-LIGHT APPARATUS.—No. 3024. "Improvements relating to Flash-light Apparatus for Photographic and like Purposes." JOSEPH CHARLES STERN.

X-RAY APPARATUS.—No. 3225. "Portable X-ray Apparatus." AUGUSTUS ROSENBERG.

SEPARATING FILMS.—No. 3257. "An Improved Method of Separating Flexible Photographic Films, Cards, and the like." WALTER GEORGE PERKS and HENRY GEORGE MERRICK-FLETCHER.

HAND CAMERAS.—No. 3265. "Improvements in, and in the Production of, Hand Cameras for Photographic Purposes." THE BIRMINGHAM PHOTOGRAPHIC COMPANY, LIMITED, and FRANK ALSTON.

RÖNTGEN-RAY APPARATUS.—No. 3321. "Improvements relating to Röntgen-ray Apparatus." JAMES MACKENZIE DAVIDSON.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE CONVERSION OF FORMULÆ.

To the EDITORS.

GENTLEMEN,—I trust you will permit me to remark that the incompatibility of the earlier portion of the letter you kindly inserted in your issue of February 22 with the later portion is due to the amalgamation of a couple of letters I troubled you with, the first of which exemplifies the inadvisability of jumping hastily at conclusions. Two factors for the conversion of grains would certainly not improve matters!

"J. F. T.," in the same issue, questions the tacit assumption of a 480-grain ounce in photographic formulæ. Were it necessary, one might refer to the explicit statement on p. 580 of the ALMANAC, in support of the contention that this is the case. Its divisibility appears to be its sole recommendation, and doubtless it will perish unmourned of senile decay during the present century.—I am, yours, &c.,

February 22, 1901. J. DORMER.

THE McDONOUGH-JOLY PROCESS.

To the EDITORS.

GENTLEMEN,—It is with a considerable amount of reluctance that I take my pen to write this letter to you, as Mr. Fawcett has been so kind as to render me much assistance in the practical working of the "Lippmann" process of colour photography. I feel it, however, as the author of the article on the McDonough process published in your issue of January 18, 1901, my duty to answer Mr. Fawcett's attack in last week's issue.

I will immediately start by discussing Mr. Fawcett's suggested improvements. There is absolutely no necessity to have the screens ruled as finely as possible. Apart from the great expense of ruling these three-colour screens beyond a certain limit, there is also the physiological phenomena, which I have fully explained in my abovementioned article, which show that such a course is unnecessary. Again, in case of a failure we should, by adopting Mr. Fawcett's suggestions, not only lose our positive, but also our colour screen—a very important point, from the economic side. Further, as matters stand at present every "chromatic-balance shutter" is adapted individually to the "taking" screen—an obviously impracticable detail in Mr. Fawcett's improvement. Finally, in my opinion, there would be a very great deal of difficulty experienced by the majority of photographers in getting suitable "reversals," eliminating even the obstacle of the increased exposure point altogether.

I am very strongly of opinion that Mr. Fawcett's suggestions have been tried, and discarded as impractical by Mr. McDonough himself—in fact, I believe he provisionally protected the method.

If Mr. Fawcett could only manage to pay a visit to the Exhibition now being held at the Crystal Palace, he would, I fancy, find most of his objections vanish, and be satisfied that landscapes can be very satisfactorily photographed, and that "still-life" subjects are only represented by about half a dozen slides. I regret that it is not possible, just at present, for Mr. Fawcett to procure the new American screens, &c., as now I can only assure him, from my own experience, of the extreme easiness of the "registration" detail. The optical contact between the screen and positive cannot, of course, be absolutely perfect on account of surface irregularities, but they are only noticeable by angular view—a procedure normal individuals would hardly go in for.—I am, yours, &c., ARTHUR V. KENAH.

2, Eliot-hill, Blackheath, S.E., February 24, 1901.

ORTHOCHROMATIC RECORD PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—At the present time we have the opportunity of estimating, to some extent, the value of animated and ordinary photographic records of military and State ceremonies of historical importance. With such subjects the correct representation of uniform is of considerable moment, and it is a matter for regret that the majority of the photographic reporters, if not all of them, apparently quite ignore the use of orthochromatic processes. All the recent photographs that I have seen fail to make any distinction between scarlet and dark blue, and, worse still, nearly all fail to represent the yellow braid or red facings that are of such distinctive importance. According to the photographs, the Horse Artillery wore undress jackets with full dress headgear at the Royal Funeral; but they did not. The bright yellow braiding with which the front of their jackets is covered is only just faintly visible in some photographs, and quite invisible in others. The precisely similar gold braid of the sergeants is clear enough, but the yellow does not show. It is an insult to the "Right of the Line" to thus shear off all the distinctions of the men that take precedence of all other soldiers. This is not a mere quibble, the effect is so marked in some of the photographs, and especially in the animated ones, that they may at some future time be quoted in evidence of a theory that the R.H.A. were not permitted to exercise their indisputable right of driving the gun-carriage. Surely some slight improvement could be effected by simply using orthochromatic plates and films; and, in the case of the camera views, is it not possible to also use a Planar lens at f-4 with a lightly tinted screen, and still have intensity enough for a rapid exposure?

No expense was spared to secure good points of view, and an extra £20 or so on each set of apparatus would not have been felt by the big firms of publishers who sent out the photographers, while the results would have been of much greater value as records. I do not know whether orthochromatic film is ever used in the kinematograph, or whether the use of a Planar with a screen has been actually tested for rapid work, but I can see no reasonable objection to the use of either one or the other.

The utter neglect of orthochromatic methods by the great majority of photographers is very strange, and not very creditable to their common sense. It might be worth while to inquire if this matter is being considered as it ought to be by those who are collecting general photographic records. Records of costume and uniforms are of considerable importance, but it is useless to pile up misleading records, wrong not merely in general colour values, but also by reason of the omission of important detail, as in the case I have referred to.

In a few months we may expect a number of important ceremonial state displays, a Coronation, and probably a great Imperial review of troops. It is to be hoped that some steps will be taken to secure better records of these ceremonies.—I am, yours, &c.,

February 25, 1901. C. WELBORNE PIPER.

A CORRECTION AND AN EXPECTATION.

To the EDITORS.

GENTLEMEN,—In referring to the question of the ruling requisite for the plates, papers, &c., to be used in my newly suggested method of line-photography in colours, I made a hasty statement which I am now anxious to correct. I wrote that, on the assumption that the colour-curve theorists are right, "my above-described simplification obviously becomes valueless." This is only a partially valid statement.

Obviously, if the "viewing" and the "taking" line-colours must be distinct, the original positives in colour will be faulty. But equally obviously "copies" of these, taken in the camera (or by contact printing), might be quite accurate; that is, supposing the glass, paper, &c., in which these copies were taken were ruled with lines of modified reproduction colours.

Copies in the camera would be taken, of course, according to the method employed for taking the original colour positives, viz., through the uncoated back of the glass or other support, the other side of which would be lined and coated over the lines with an "iso" film. A light filter would be necessary, of course. Theoretically, also, contact printing in a frame directly from an "original," or, indeed, any transparent colours whatever, would be equally easy. The copying sheet, &c., made transparent, would be lined and coated over the lines (iso film) just as are plates to be used for taking originals, save that, if necessary, the lines could be of different colours, and also transverse, &c., to those ruled on the "original," as most suitable. The "original" to be copied would be placed with its image-bearing surface in contact with the uncoated side of the copying paper, and the two placed in a frame, the copying paper being at the bottom. Exposure to daylight could be made through a measured light-filter, which could be slid into the top of the frame as its lid. The copy is then developed as a positive, and fixed, and should reproduce the colours of the "original." This is the suggestion. I hope to test this suggestion very shortly. It would be pleasant to get some decent prints (unreversed) in colours with ease. Very fine ruling would be required for best effects.

Of course, if as most Continental, and so many of our own best, authorities seem agreed in holding, the same (substantially) colours are suitable both for "taking" and "projecting," my "originals," as well as the "copies," will be accurate, or approximately so. And anything beyond approximation is out of the question for indirect three-colour photography.—I am, yours, &c., E. DOUGLAS FAWCETT.

February 24, 1901.

SEMI-OPAQUE BACKING FOR TRANSPARENCIES.

To the EDITORS.

GENTLEMEN,—I notice some correspondence in your columns re the above. I have no doubt that many of your readers may remember that, a long time ago, I made and exhibited before the L.P.P.A. an excellent method of producing an artificial ground-glass effect. The plan was simplicity itself. Two methods I adopted; one was by triturating sulphate of baryta with gelatine, and adding it in q.s. to the gelatino-chloride or bromide emulsion; the second method, and the best, is to make a precipitate of the sulphate by decomposition à la bromide, wash the emulsion, and add as aforesaid. I produced an effect (unlooked for), i.e., a picture printed right out when viewed by reflected light, might be darker when looked at by transmitted light. I cannot understand why plate-makers do not avail themselves of the principle, and make them a marketable commodity. I don't remember the date of publication, but I believe you noticed the idea at the time. Sulphate of barium gives a peculiar semi-opaque crystalline deposit very suitable for transparencies. One hint to experimenters: In making an emulsion of sulphate use very little gelatine. I remember the precipitate was so slow I thought my chemistry was abroad.—I am, yours, &c., A. L. HENDERSON.

Lung Arno, 13, Terristori, Florence, February 18, 1901.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Mr. Farmer, in his letter of January 25, p. 63, states, as the correct principle of colour selection in trichromatic photography, the use of three spectrum bands, "red, green, and violet respectively," and that in this he is in accord with Clerk-Maxwell, Du Hauron, and, presumably, with Mr. Tallent and practical three-colour process operators generaly.

I am sure that my letter sent off to you last week entirely disposes of that proposition. I have certainly shown (1) that pure-colour analysis will not differentiate many colours which are very different to the eye; (2) that Clerk-Maxwell, Du Hauron, and Mr. Tallent certainly are not agreed as to the correct principle of colour selection; (3) that whatever Clerk-Maxwell meant to teach, it was with respect to positive synthesis only, and if he advocated "pure-colour" analysis for that purpose, he was wrong, even by Mr. Farmer's own admission that "in this case the Maxwell curves are substantially correct."

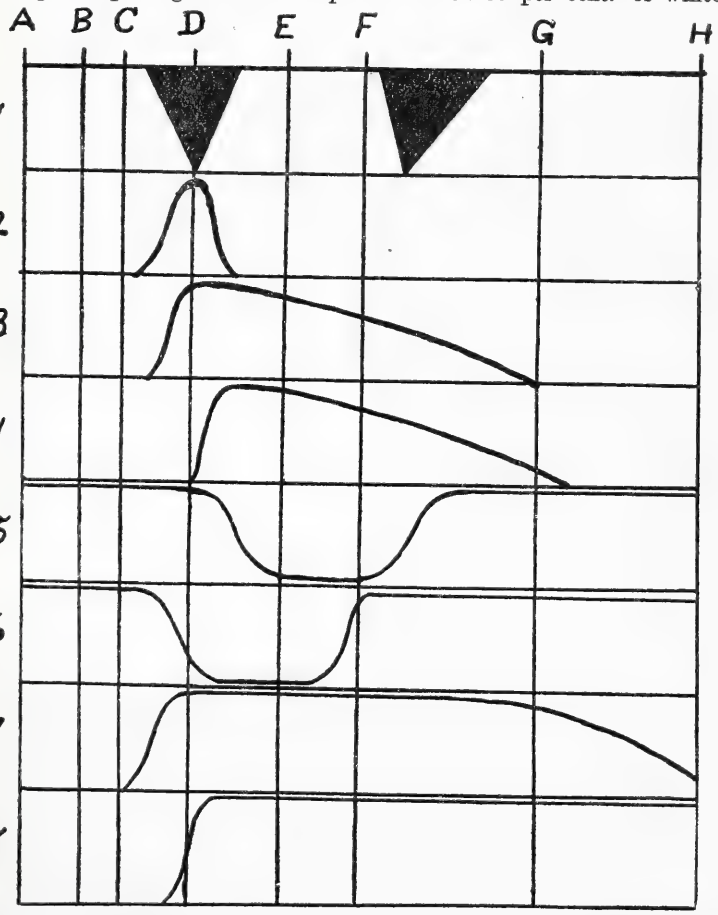
If Mr. Farmer had stuck to his original and fundamental proposition and statements, my answer was conclusive. But he does not do this; and in his article on pp. 68 and 69, he gives two sets of analysis curves, which would yield results not only totally different the one from the other, but also quite different from the pure-colour analysis which he advocated as a fundamental principle.

It is very difficult to carry on a discussion in the face of such loose and inconsistent statements, and it is this sort of thing that I have had to contend with for thirteen years. I must, however, admit, that if Mr. Farmer is inconsistent, and in error in some of his statements, he has at last stated a definite proposition as an alternative to the Maxwell curve analysis, and not one only, but three, and that each of these can be discussed separately, and upon its own merits.

I have no hesitation in saying that neither of his analysis diagrams will bear even the most superficial examination by anybody who has any expert knowledge of colour absorptions and colour measurements. A large volume could be filled with specific illustrations of defects that would be introduced by adopting such analysis as he proposes, but most of these illustrations would involve elaborate measurements of absorptions and luminosity values, with the plotting of curves and

subsequent arithmetical analysis, the results of which would be conclusive to anybody who could follow them, but would mean nothing to the superficial observer. For the class of readers to whom Mr. Farmer's argument is addressed, illustrations of a very elementary character are demanded, and on the principle generally acknowledged by scientists that a single absolute exception destroys a theory, it is to be hoped that the examples which I shall give will prove sufficiently conclusive even to the unscientific.

To commence with Mr. Farmer's first diagram, intended to secure a reproduction of the spectrum with transparent pigment colours: First of all, one cannot fail to be impressed with the fact that these curves are further removed from "pure-colour" analysis than even the Maxwell curves! The green analysis curve extends from the middle of the red to the middle of the violet, and the maximum extends from the orange-yellow to the greenish-blue; the red analysis curve extends into the blue, and the violet curve into the yellow. Mr. Farmer complains that the Maxwell curve analysis would degrade the spectrum green with black in pigment colour prints. Mr. Farmer's analysis, since the green part of the spectrum gives half as much density in the red negative as it does in the green negative, and also half as much in the violet negative as in the green negative, would put down his "blue" and "yellow" printing colours in only half their strength (in separated lines or dots on white ground in typographic process), thus reducing the pure green of the spectrum with 50 per cent. of white.



Think of representing the pure green of the spectrum by superposing "blue" and "yellow" prints, which, besides being made with colours originally incapable of reproducing such a pure green in ordinary white light, are printed only to half density to represent the green of the spectrum! Yet it wants only a little knowledge of primary arithmetic to see that this is exactly what Mr. Farmer proposes to do.

If Mr. Farmer had made his "red" and "violet" curves meet in the pure green of the spectrum instead of crossing, he would have furnished a far more plausible argument, but he would then have come just so much closer to Maxwell's curves.

There are other fatal defects in these curves, but they are not so superficially obvious; and, inasmuch as these curves, which out-Maxwell Maxwell himself as to their "impurity," are not at all what Mr. Farmer would adopt in the practice of trichromatic photography, I shall pass on to the second set of "curves."

In the first place, it is not true that these "curves" are in "substantial accord with the teachings of Professor Clerk-Maxwell, Messieurs Louis Ducos du Hauron and Charles Cros, of Professor Von Hubl and others," if I am competent to interpret the writings of all of these gentlemen. If they are, then so much the worse for the future reputation of these gentlemen as experts in this line, because it can be shown by the same kind of proof that I adduced in my last letter against "pure-colour" analysis, that the analysis in accordance with these "curves" is only better in a limited degree than "pure-colour" analysis, and still absolutely inadequate to record differences of colour and luminosity which one may at any time be called upon to reproduce in the practice of trichromatic photography. Of course, so long as it is assumed that the only hues which one has to deal with are those which Mr. Farmer describes vaguely, and as being "usual," such analysis may answer practical purposes where fine differentiation of hues and luminosity values is not required. It is the procedure which I have recommended for poster and label effects, intended to catch the eye by their brilliancy and crudity. But, so far from being "pure-colour" analysis, it represents the action of all the spectrum rays, though with the smallest action in the very brightest part of the spectrum. It is a compromise between the "pure-colour" and the "colour-curve" principles, and, as such, represents a medium between the absolute failure of the pure-colour analysis as demonstrated in my last letter, and the Maxwell curve analysis which carries the colour-curve principle to its logical conclusion. To apply specific tests, we must resort to diagrams of the spectrum absorption of actual colours, as I did in my last letter. We shall then find that while there is naturally more differentiation of hues, due to the fact that all of the visible spectrum rays act in the analysis, the differentiation, especially as to shade and luminosity values, will be demonstrably very imperfect.

In the diagram given herewith, 1 represents Farmer's analysis "curves." No. 2, although a moderately strong colour, because it absorbs completely the most luminous of all the light rays, would be so very feebly represented in Farmer's red and green negatives that it would reproduce as an almost invisible tint. No. 3 is a violet, and and No. 4 a crimson. The dominant absorption of the violet being in the most luminous of the light rays, which are almost without action in Farmer's analysis, would reproduce not as a violet, but as a crimson of only very slightly different hue from No. 4. Nos. 5 and 6 are very different qualities of green, which would be very feebly and inadequately differentiated by Farmer's analysis, because the quantitative action in the respective negatives would be almost identical. One stops some of the action by the blue-green rays, and the other an equal amount by the yellow-green, both of which act to full intensity in the green negative, according to Farmer's diagram. Neither colour acts to any material extent in either of the other two negatives. The left-hand absorptions of 5 and 6 also represent two quite different qualities of blue-green, which would be only feebly differentiated in the reproduction, because the difference of absorption lies mostly in the most luminous but least active spectrum rays. No. 7 is a deep and almost imperceptibly purplish-red, which would reproduce as a purple, or as a dull crimson if the violet screen transmitted ultra-violet light. No. 8 is an orange-red, which would reproduce as a deeper and purer red. The errors in all these instances would be greater than the measurements of areas alone would indicate, because the luminosity values are such as to still further differentiate colours; and the errors of analysis, which are made so obvious by these diagrams, are greater only in degree than they would be with hundreds of dye, flower, and mineral colours.

All of these colours would be very perfectly differentiated by Maxwell curve analysis, and the record would be one of luminosity values as well as hues.

Mr. Farmer's proposition that in trichromatic printing we are not using the same amount of each colour sensation for the reproduction of all hues is true only if the printing colours fail to meet my specification as to colours most specifically antichromatic to the primaries of ordinary white light. Given such printing colours, the function of the reproduction colours is photometrically the same whether they be plus or minus colours. Mr. Farmer's argument respecting the greater luminosity of pigment colours, as compared with spectrum colours, can be applied to the printing colours, and turned against his criticism of the Maxwell curves on the score of degradation by introducing black.

Mr. Farmer's eulogy of the methods which he advocates, apparently so much at my expense, is premature. I am still clearing away rubbish, and have no doubt that I shall be satisfied with the final verdict. I quite admit that my exploitation of the colour-curve principle of analysis has been calculated to provoke unbelievers to make observations of the character which Mr. Farmer indulges in, but it really was necessary to do something to provoke discussion, even if I had to make myself a target.

In conclusion, it is as easy for me to say that Mr. Farmer's methods are useless, as it is for Mr. Farmer to say that my methods are useless. Mr. Farmer will not admit my testimony as to the success of gelatine three-colour printing from colour-curve negatives, and I cannot admit the efficiency of methods which break down on such simple diagrammatic tests as I have indicated. I am satisfied that Mr. Farmer's condemnation of my principle is due to his failure to properly carry it out, and that anybody who works his principle in competition with my own, as it will before long be extensively carried out, will eventually conclude that there is a screw loose in their method. In all this I am not saying, and I never have said, that the use of such printing colours and methods as we may be forced to adopt in practice, will not involve any modification whatever of the

Maxwell curves. At the very start, in February, 1888, I proposed that the most efficient available printing colours should be the starting point, and the analysis curves worked out upon the spectrum itself with these colours. This, if I understand him, is the position taken by Mr. Tallent to-day; but Maxwell's and Abney's colour measurements prove that for the most perfect differentiation of hue and luminosity values, the printing colours must be such as will yield analysis curves approximately like Maxwell's, and certainly very different from Farmer's.—I am, yours, &c., F. E. IVES.

2750 N. 11th Street, Philadelphia, February 11, 1901.

RE COUPONS AND CASH FOR PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—The enclosed correspondence, begun before your article appeared, may be of interest. Re your article of February 15 issue, we observe with regret that your usual impartiality has, we fancy, a "bit of a kink" in it in favour of the tobacco people.

An article from your influential JOURNAL with the "kink" the other way, would, in all probability, have made it clear to the originators of such schemes that a world of photographic influence would be active against them.

Your remark, "There is nothing to be said against" such firms supplying photographs in this way does not, we feel sure, represent the opinion of your readers. In our opinion, there is everything to be said against such schemes, inasmuch as it is not fair competition. Whether the coupons be upon tobacco, tea, or magazines, it is using a mighty power of publicity, and unlimited capital, to turn out of its natural course the work thousands have, at great expense, qualified themselves to perform, and so rob them of their living.

Such schemes, you say, "can only be objected to upon the very unsubstantial ground of sentiment." Why, you would have us think you are as unfeeling as a Sphinx, when we know otherwise. Know, then, this same sentiment is a mighty power in the world yet, and half the actions of men's lives are prompted by it.

But we trespass upon your space, and will only say that a determined front should be shown by the photographic community and press against such schemes, and, this being known to big advertisers, they would be wise enough to adopt some other method to introduce their wares. We quite believe, even now, that a committee representing the photographic interests throughout the kingdom would succeed in effecting the withdrawal of the scheme if the various firms were approached properly.—We are, yours, &c.,

NEWMAN, MAYALL AND CO.

91, King's-road, Brighton, February 24, 1901.

(COPY.)

"Messrs. Ogden's, Limited.

"Dear Sirs,—

"In the name of the photographers of the United Kingdom, we beg to hand you our protest against your now advertised scheme of coupons and money payment for photographs. Your system we consider unfair to the many thousands of workers in the photographic profession to whom the reproduction of photographs is a big item in their business, and whose interests you perhaps overlooked when framing your scheme to advertise your tobacco and cigarettes. If your wares are the best on the market, the discerning British public will speedily make the discovery, but if your object is to induce the said public to 'sample' your cigarettes and tobacco, and so begin business with you, why not distribute sample packets? give greater number of cigarettes in packet, or lower cost? (most powerful of all, if this can be done without sweating or in any way you please as long as you deal in your own goods).

"To our protest and all we say, you may reply: 'It's a free country,' &c. Quite so; but I trust this callous and unsympathetic view will not be taken.

"In their own interests, the thirty to forty thousand photographers of the kingdom, together with their influence, must be enlisted against your firm and their weekly purchases of the 'soothing weed' distributed amongst other manufacturers.

"We trust you will withdraw the afore-mentioned scheme, and devise another which may give your firm greater publicity and success without depriving workers in photography, or any other business, of work they are morally or legitimately entitled to.—Yours, &c.,

"NEWMAN, MAYALL AND CO., pro Phil. Newman."

(COPY.)

"Messrs. Newman, Mayall and Co., 91, King-road, Brighton.

"Dear Sirs,—

"We are in receipt of your favour of 12th inst., and, in reply, can only say we should be much concerned if we thought our action would have such a disastrous effect as you foreshadow upon your honourable profession. Nothing could be further from our intention, and, to avoid anything of this kind, we purposely refrained from arranging that the original photos should be taken by any of our agents. On the contrary, we consider our scheme will lead to a much larger demand for the services of the photographers.—Yours truly.

"OGDEN'S, LTD., R. D. Walters, Director.

"Boundary-lane, Liverpool, February 19, 1901."

(COPY.)

"Messrs. Ogden's, Limited.

"Dear Sirs,—

"We beg to thank you for your courteous reply to ours re your scheme of coupons and cash payment for photographs. Unfortunately, we cannot view the matter as you suggest, as not one in a hundred of your patrons would think of giving a special sitting for the photograph they sent you, but invariably send photographs already by them of themselves, parents, or deceased friends or relatives, and by so doing deprive the members of what you gracefully describe as an honourable profession of a big part of their means of existence.

"We again ask your kind reconsideration of the scheme, and the substituting another more effective for your own good, and inoffensive to a large and intelligent section of the general public.—We remain, dear sirs, sincerely yours, "NEWMAN, MAYALL AND CO.

"February 20, 1901."

(COPY.)

"Messrs. Newman, Mayall and Co., 91, King's-road, Brighton.

"Dear Sirs,—

"We are in receipt of your favour of 20th inst., and would suggest you reading the article in THE BRITISH JOURNAL OF PHOTOGRAPHY, No. 1218, vol. 48, February 15. We might also add, that if we drop this scheme, we know for certain that others will take it up.—Faithfully yours,

"OGDEN'S, LTD., R. D. Walters, Director.

"Boundary-lane, Liverpool, February 22, 1901."

THE ACID FIXING BATH.

To the EDITORS.

GENTLEMEN,—The acid fixing bath is, at the present time, so much in favour with photographers, that the warning against its employment uttered by Mr. Chapman Jones, in the pages of your contemporary, "Nature," and reproduced in the pages of the photographic press, should not pass without some criticism. From a theoretical and chemical point of view, I am quite unqualified to discuss Mr. Jones's strictures on the use of this bath; but, from the practical every-day use of it, I think that my experience qualifies me to speak in its favour. For eleven years I have constantly used a hyposulphite bath, made acid with bisulphite of sodium, the negatives being fixed in one of normal strength first, and, finally, in a second containing half the amount of sodium thiosulphate. The washing afterwards has never been abnormal; indeed, my practice in this respect has been rather heterodox; the washing would doubtless be considered perilously inefficient by the mass of photographers. At a rough computation, I have, in the last ten years, made about 10,000 negatives with the aid of an acid fixing bath. Many of these have been exposed, on an average, each year, about three months, continuously, to the light of spring and early summer, and in no single instance can a case of fading be traced to the fixing-bath. The negatives are coated with a very horny collodion and carefully selected varnish.. Not a few among this number of negatives have been intensified, either with mercury (followed by development with hydroquinone), or with silver, and these are equally unchanged from their original condition. Of course, it is quite possible that an amount of fading that would pass unnoticed in the ordinary photographic negative, and that would be too infinitesimal to affect its printing quality, would be discernible in star-negatives by the disappearance of some faintly impressed star. Personally, I have the very greatest faith in the acid fixing bath when properly made and used, and it would be unfortunate if Mr. Jones's criticism of this bath should deter photographers from availing themselves of a ready means whereby they may keep their fixing bath free from colour until it becomes exhausted.—I am, yours, &c.,

326, Camden-road, N., February 25, 1901. G. T. HARRIS.

THE ORGANIZATION OF PHOTOGRAPHERS.

To the EDITORS.

GENTLEMEN,—It is very delightful to hear your correspondent, "J. Rudston," talk of organization among photographers re the cigarette and soap photographs.

Had he studied the events of the last ten years he would have come to the conclusion that a more helpless being than the professional photographer and his assistants does not exist. Where is the Photographers' Benefit Society, for instance? And what is the position of the professional as regards the Plate-makers' Association?

Would any other class of tradesman submit to the indignity at the hands of the manufacturers of not being on the same basis as a dealer?

Where is your working painter, plumber, or blacksmith, that does not get his goods at the same rate as the dealers in the various articles required. It is simply sufficient to be in the trade, whether a worker or shopkeeper it matters not.

Had photographers organized, or even now did they do so, the irritating distinctions between dealer and professional would be impossible. But no, professionals are far too busy cutting each other's throats to think of banding themselves against such things. And now Nemesis has come in a totally unexpected manner, and the gay and

festive disjointed price cutters have themselves been cut in an unlooked-for direction.

Well, we must grin and bear it, that's all. We have the solace that before the soapmaker can execute the picture he must have a copy to work from, which must have been taken by somebody, perchance a poor professional.

Only organized power could in any way thwart this attack upon photographers by preventing those loyal firms who, for the sake of a little extra gain, supply material to be used to the detriment of those who created them, and made them, to a great extent, what they are, not forgetting, of course, the quasi-amateur, who supplies the pictures "just for cost of material, you know," who will feel the cut too.—I am, yours, &c., OTHELLO.

February 25, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

G. Laurens, 56, St. Andrew's, Uxbridge, Middlesex.—*Photograph of proclaiming the King.*

E. H. Roberts, 30, High-street, Marlborough.—*Photograph of reading the proclamation of King Edward VII.*

J. Davis, 56, Ainslie-street, Barrow-in-Furness.—*Photograph of Furness volunteers for the Active Service Relief Company.*

B. V. H.—We fear we cannot help, but will keep your letter before us in case opportunity arises of stopping the man's proceedings.

A. H. M.—An apparently simple, but, in reality, a large question. According to our lights, our answer is: one not professionally engaged in photography.

THE KROMSKOP.—"COLOUR PHOTOGRAPHY" writes for the name and address of the firm who supply the Ives' "Kromskop," &c.—In reply: Address the Photochromoscope Syndicate, The Pavement, Clapham, S.W.

PRINTER.—We should recommend the first-named: the last-named would, perhaps, be too slow. Without precisely knowing your difficulty we cannot advise ; but we have used the ordinary and succeeded in getting suitable results in outdoor work.

R. FUGIEN.—(1) Inquire of Messrs. Zeiss, 29, Margaret-street, London, W. (2) We do not think that the instrument is obtainable commercially, but you might inquire of Messrs. Sanger Shepherd and Co., 5, 6, and 7, Gray's Inn-passage, Red Lion-street, Holborn, London, W.C.

STEREOSCOPIC PHOTOGRAPHS. — EDITH BROWNING writes : "Could you oblige me by saying the name of a firm who could supply me with stereoscopic views (say Derbyshire views)?"—In reply: Inquire of Messrs. Underwood and Underwood, 26, Red Lion-square, London, or Messrs. Seaman and Sons, Chesterfield.

METEOR.—Your queries were unfortunately overlooked. (1) According to our experience, which is not very recent, they are about the same rapidity as the Ilford Empress. (2) Yes, we think so; we should regard such subjects as "very dark," or "non-actinic." (3) Yes; or a wooden cone on the front of the camera would answer.

CIRCULAR PHOTOGRAPHS.—"INQUIRER" writes: "Could you tell me how these popular circular photographs are cut ? Is it circular glasses used or a special apparatus of some kind ?"—In reply: Messrs. G. Houghton and Son, of 89, High Holborn, W.C., sell a little circular print trimmer—"The Beam"—which should answer your purpose.

THE "TOBACCO PIPE" FLASHLAMP.—J. C. TAYLOR writes: "In your recent article under the heading of "Dull Weather Difficulties," you mention a flashlamp, viz., the well-known tobacco pipe combination. Could you tell me where that lamp is to be procured ?"—In reply: Inquire of Mr. Archibald Watson, Plumber, George-street, Glasgow, who made the lamp referred to.

SPRINGS FOR PRINTING FRAMES ; OLD NEGATIVES.—H. F. and Co. ask "(1) Where springs for ¼, ½, and whole-plate sized printing frames may be obtained. (2) Where they can dispose of about four cwt. of old glass negatives."—In reply : (1) Probably of Mr. Fallowfield, Charing Cross-road, W. (2) An advertisement offering to buy old negatives appears in a recent number of the JOURNAL.

OPALINES, &c.—A. E. O. writes: "(1) Please give me address of wholesale houses for opalines, materials, plush, &c. (2) Also how to put names at the bottom of prints."—In reply: (1) All the large dealers, such as Marion and Co., Houghton and Son, Fallowfield, &c. (2) Either write them on the negative with an opaque ink, or use the "Nameit," sold by Richford, 44, Snow Hill, E.C.

FILMS OR PLATES.—R. C. V. L. writes: "Do you consider that negatives made on cut films are equal in every way to those made on backed plates, both for interiors and outdoor work, especially if the negatives are intended for enlargement ?"—In reply: We have seen, possess, and have produced good negatives on both supports which, in respect of photographic qualities, are indistinguishable.

COPYRIGHT.—J. E. DAMON writes : "I have photographed the 'Roya Alberta' entering the harbour, and it has turned out a very good print for the time of day, twenty minutes past four p.m. I should like to copyright same, and should be pleased if you will let me know what it will cost, and who to send to ?"—In reply: Send our publishers two unmounted prints and one and sevenpence and they will effect registration for you.

COLLOTYPE.—J. A. says: "I want to make some trials with the collotype process, and have been given a pair of leather lithographic rollers. They seem very hard, having lain by for a dozen years or more. Will these answer the purpose ?"—In reply: In their present condition they will not. Very much depends upon the condition of the rollers and as you, apparently, know nothing of the work, we should advise you to take the rollers to a lithographic printer to get them in working order, if he can. If not, you will have to get them re-covered.

PHOTOGRAVURE.—F. W. DONISTHORPE writes: "Will you tell me if there is any book which will tell me how to make my own sensitised metal plates for photogravure, or any other bas-relief photography? And also, whether common asphalt will do, which has been exposed to the light for some time?"—In reply: Mr. Denison's work on "Photogravure," Ordinary bitumen will do. It does not matter if it has been exposed to light. By the way, photogravure is an intaglio, not a relief, process.

OPENING ON SUNDAYS.—J. T. W. writes: "Many of my customers have asked me to open my studio on Sunday. What I require to know is, if it would be against the law to open on Sundays ? Would it make any difference in the case of advertising it as open on Sundays?"—In reply: Under an Act of Charles II., it is illegal to carry on business on the Sunday, and those who do so render themselves liable to a penalty of five shillings. This old unrepealed Act is, however, seldom now enforced, or there would not be so many businesses carried on, now, on Sundays as there are.

GUM-BICHROMATE.—G. U. M. says: "I have seen that office gum will answer for the gum-bichromate process. Will you please tell me what proportion of gum to the ounce this contains, as its use is more convenient than having to dissolve the lump gum arabic ?"—We cannot tell the proportions, but they probably vary with each maker. Some of the so-called "Office Gums" really contain no gum arabic at all. If you wish to work the process you had better procure gum arabic, and use it according to the directions given in Mr. Packham's paper; you will then be on a fair way to success.

STUDIO-BUILDING.—"JACK BATH" writes: "Enclosed two plans for studio :—(1) Will No. 1 be sufficiently lighted as shown, without putting in side light? (2) Supposing difficulties, &c., prevent me building as No. 1, would No. 2, considering aspect, be workable? (3) Supposing either was available, which should you recommend?"—In reply: (1) There would be light enough, but we should prefer to have a side light starting from about two feet six from the floor, so as to bring the eaves to about seven feet six high. (2) Yes, but the studio would be more troublesome to work. (3) No 1, decidedly.

SPOTS ON P. O. P.—S. CRAWFORD writes: "Can you explain the cause of the (small white) spots on the enclosed print, which appeared after mounting (with starch) ? The paper has been manipulated carefully according to maker's instructions, but without sulphite in toning bath. The spots only occur occasionally."—In reply: The spots are clearly due to something in the manipulations. There are several causes for similar spots; but, in this case, we are inclined to the opinion that they are due to particles of pernicious matter, either in the washing water, or as dust in the atmosphere settling on them while in a moist condition.

CARBON PRINTING TROUBLE.—T. CONNOR says : "I have just been trying my hand at carbon printing, and I find a great difficulty in getting the tissue to dry after it is sensitised. Sometimes it is hanging in the dark room for two or three days before it is dry. Another difficulty I find is that when I go to develop the print the paper will not come off in the warm water (100 degrees), but the tissue itself generally comes off entirely."—In reply : If the tissue takes two or three days to dry, we are not surprised that the paper will not strip off, and that the tissue leaves the support. By the long drying it has become insoluble and spoilt. The dark room is a very unsuitable place wherein to dry tissue. Dry it in an ordinary room, where it will dry in a few hours.

THE SILVER BATH.—"FERROTYPES" writes: "I notice that according to Mr. C. W. Gamble (in his book on 'Wet Collodion Photography') formula for silver bath is silver nitrate 600 grains; sodium carbonate 30 grains, in crystals; water (distilled) 5 ounces; nitric acid (pure) 10 minims. The formula given in your valuable ALMANAC is silver nitrate 5½ ounces, distilled water 80 ounces, nitric acid ½ drachm. What I want to know is what is the object of carbonate of soda in the silver bath ? What is its action ? Which is the best formula ? Or kindly give the best formula for silver bath for ferrotypes, one that will produce the best of ferrotypes."—In reply: We have not Mr. C. W. Gamble's book before us, but we think you must have misquoted the proportions. The formula, quoted from the ALMANAC, is an excellent one for ferrotypes and glass positives, and is the one generally employed for the purpose.

*** A great deal of matter is unavoidably held over till next week.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

Photography in the Witness-box.

Since the famous Tichborne trial, now more than a quarter of a century ago, it is doubtful if photography has been in greater prominence in a criminal case than it was last week in the Yarmouth murder trial. The question upon which the opinion of experts was asked was as to whether a watch chain that the deceased had on when she had a photograph taken on the beach at Yarmouth was of a link pattern or of a rope pattern. As is usual in such cases, when expert evidence is called, it was more or less contradictory. It appears that the portrait was of the usual beach photograph type, and the photographer who took it said that he had given it two and a half seconds' exposure. Now, one can well imagine that, with such an exposure, there would be some movement in the chain owing to the breathing of the sitter, or, perhaps, by a slight movement of her body, and with this movement it would be very difficult to decide conclusively, from the photograph, as to the exact pattern of the chain, hence the diversity in the experts' evidence. It is noteworthy that the learned Judge—the Lord Chief Justice—who tried the case showed a greater knowledge of photography than is possessed by the Bench in general. After remarking that the picture was not out of focus, he said, "The circumstances under which these photographs are taken make it very difficult to compare them with those taken in the studio. I think it perfectly clear in both that the chain was moved during the operation." As a rule, the Judges display a great lack of knowledge of our art when it figures in Court, and sometimes, by their remarks, make confusion worse confounded. That was not the case, however, in the Yarmouth trial; it was just the reverse. It occurs to us that the photographer who took the beach photograph is to be congratulated on his memory, for it is not every one who can remember, after a considerable lapse of time, the precise exposure he gave for any particular picture.

* * *

Reducing Carbon Prints.

A correspondent, whose letter appears in the correspondence columns this week, asks about a method of reducing carbon prints by chemical means that has been published, and it may be interesting to say something about it, for it is curious to note, as we have said on many previous occasions, how old ideas and methods that were in use in former times, and often forgotten, get unearthed, or reinvented, and introduced again as something new and original. Here is another case in point. In one of the recent numbers of "The Photo American," which we quoted in our issue of November 16 last year, Dr. Hendrikson gives a method of reducing over-exposed carbon prints, or those made on tissue that has become somewhat insoluble by keeping. The method is, to add to the warm developing water a solution of chloride of lime—the ordinary bleaching powder. Now, this is a method that was well known to old carbon workers more than thirty years ago, and it was first introduced by Mr. J. W. Swan. The reducing action of chlorine is twice alluded to by the late Mr. Wharton Simpson in his work on the "Carbon Process," published in 1867. Here is an extract taken from Defects and Remedies:—"Over-exposure. An over-exposed print will develop tardily, and continue under ordinary treatment, too dark. After all

the soluble chromic salts are removed, the temperature of the water may be raised, and by long soaking in hot water the depth may be reduced considerably. Mr. Swan has found that immersion for a short time in a very weak solution of chloride of lime, or of hypochlorite of soda, or in chlorine water, or peroxide of hydrogen, rapidly reduces the print by decomposing a portion of the insoluble chromo-gelatine compound, and restoring it to its original condition of solubility. The action is, however, too energetic to be of much practical use in the reduction of over-printed pictures. Protracted immersion in hot water is the best remedy." With that, we think, the majority of practical carbon workers will agree, for the chlorine treatment is liable to alter the tint of the picture by its bleaching action. Although the reducing action is due to the chlorine rendering the gelatine more soluble, it at the same time exerts its bleaching property. This would not effect the colour if the pigments in the tissue were simply carbon, or some of the metallic oxides; but, in the case of cochineal or madder lakes, often used to give warm or purple tones, the case would be different. Some of that colour would be altered—bleached out. In this way a print, reduced by the method suggested, would be of a different tint from one reduced by the prolonged action of hot water. From the above it will be seen that the method described by Dr. Hendrikson is a very antiquated one.

* * *

Copies by Phosphorescence. Over the signature F. Jervis Smith in last week's "Nature," appears a valuable and interesting communication with regard to the copying of illustrations from a book or print which may not be removed from its surroundings, as in the case of a public library, and so on, where there are fixed rules that prohibit the removal of works. "Reproduction," Mr. Jervis Smith points out, "by the methods of ordinary photography, is most inconvenient, since the employment of artificial light is strictly prohibited; also, the inntroduction of a camera and its manipulation in a library are surrounded by many difficulties. These circumstances led me to devise the following method for obtaining copies of engravings, printing, and writing. A piece of cardboard is coated with the phosphorescent substance [the well-known Balmain's paint would be as ready a mode as any.—Eds.] and after sufficient exposure to the light of the sun, or of an arc lamp, it is placed at the back of the engraving or writing to be copied; on the face of the engraving or writing a dry photographic plate is placed and then the book is closed for a certain time depending on the nature and thickness of the paper used in the book. I find that the period of time lies between twenty and sixty minutes." The plate is then withdrawn and suitably stored; the whole of the operations being easily carried on under a cloth without light gaining entrance. Mr. Jervis Smith states that "the results are sufficiently good for most purposes—in the case of some papers the fibrous structure is shown; this very slightly detracts from the clearness of the copies made by this process." It is evident that there are many circumstances under which such a method of copying would be useful, and to Mr. Smith's instructions we might add that the phosphorescent tablet might be rendered luminous by magnesium light; the late Mr. Warnerke proved that the luminosity so obtained was not dependent upon the amount burnt nor the length of time the tablet was exposed to the burning magnesium.

The Lost Shower of Stars. It would seem after all that the shower of shooting stars which photographers and astronomers were so long expecting really did take place, and visibly so, for the President of the Toronto Astronomical Society has made public a letter he has received from Mr. R. F. Stupart, Vice-President of the Society, Director of the Toronto Observatory, and Superintendent of the Meteorological Service of Canada, in which appear the following notes made by an observer at York Factory, Hudson's Bay:—"November 15, 1900.—Very general display of shooting stars. Some very big ones N.W. to S.E. Sky full in shoals. November 16.—Shooting stars seen till daylight. Scared the people. They thought it was the end of the world." We shall expect this communication to create some stir in the astronomical world, for it will be remembered there were most elaborate calculations made to show the probability of the shower being quite out of the earth's path, and other equally elaborate data given to show that their appearance was by no means unlikely.

* * *

A New Star. No doubt many cameras during the last week or two will have pointed to the constellation Perseus, in which there has lately appeared quite suddenly a star of almost the first magnitude. Spectroscopic observations have been made showing that during the brief time of its appearance it has undergone great changes. It is nearly four hundred years since the sudden appearance of so bright a star has been recorded, and, judging from past precedent, those who wish to preserve photographic records of the phenomenon should lose no time, though the "Edinburgh Circular" dated February 25 says: "The star is keeping up its magnitude so far as may be gathered from a very brief observation made between the clouds on Friday. To-night (February 25) it has been brighter than Aldebaran, slightly less bright than Capella." We read about it that "the predominating colour of the new star is green, with a number of bright and dark lines and bright violet-coloured bands, according to a telegram from Coburg." This will be apt to lead the ordinary reader astray, for it clearly points not to the appearance to the naked eye, but to the spectroscopic effect. Thus the City Astronomer of Edinburgh writes: "It was noticed that the light was distinctly bluish, and similar to that in the Sirian class of stars."

AN EVERYDAY INTENSIFIER.

We were asked a few weeks ago, vide our correspondence columns, to give a selected intensifier and reducer. To the latter part of the query, we gave a reply at the time, and we now fulfil our promise as regards an intensifier. We can sympathise with our correspondent in his difficulty in hitting upon one single method, for, from the very earliest days of the photographic processes, an intensifier was always in request. Indeed, in the earliest days of printing, when collodion had become the particular process for work generally—portraiture, especially, we allude to—there being nothing else available, the beautiful dry-plates of this period being far too slow for portraiture, positive pictures "converted" into negatives were commonly used. Then came "bromo-iodised" collodion and iron development, which did not really require intensification, but which, yet, were frequently so treated. From that time to the present, an in-

tensifying process was in request, and infinite have been the varieties recommended, each said to be better than any other. To ask, therefore, virtually for "the best" process, puts upon us a selecting power which we could scarcely be expected to take up. But we will give the method which we know to be adopted in at least one large establishment, to the exclusion of all others, one which we have ourselves tested and found to be good, and which is capable of simple and easy modification, according to the circumstances. It is also a process which dates back to the very earliest times we speak of, and we know of one old photographer who has used it regularly when occasion arose for well nigh half a century. He informs us, too, that he has kept collodion negatives for over twenty-five years, and (when they have been varnished) they have been as good at the end of that time as when first made. This is a fair pedigree, and we need not go further in its praise. It is a very simple and well-known one. It consists simply in a preliminary whitening by "bichloride of mercury" solution, followed by blackening with one or other agent, as we will explain. The first step is to make a simple solution of bichloride of five per cent. strength. This is one ounce in a pint. It is better to purchase the salt ready powdered, as it is highly poisonous, and the fine particles liable to be thrown into the air by the act of powdering in a mortar are dangerous to health, and likely to result in danger to exposed prints and paper which might be lying about during the operation. Five per cent. is about the maximum strength that the solution can be made, and the dissolution of the salt is much more rapid with hot than cold water. It can be more readily made by adding an equal weight of a soluble alkaline chloride. Chloride of ammonium is usually chosen, but it has no advantage over the homely chloride of sodium—common kitchen salt. Hydrochloric acid also, in smaller quantities, helps the rapid solution of the salt, but we strongly advise that it be not so used. But, in the proportion of about five drops to a pint, hydrochloric acid is a most helpful addition; it assists to keep the solution clear, and reduces the liability to stain. The following, therefore, may be looked upon as a standard formula:—

Bichloride of mercury .....One ounce.
Chloride of sodium .....One ounce.
Hydrochloric acid .....Five drops.
(Water to make a pint.)

Place all in a wide mouthed bottle, labelled "Poison," shake occasionally, and the solution will soon be ready for use. The negative should first be very carefully washed in running water to get rid of the last trace of hypo, as otherwise stains would be liable to result. Great care to keep the film free from drops or splashes of other chemicals should be taken, for it is most sensitive in this process to the slightest amount of foreign matter.

The negative should be placed in a dish, and the solution poured over it in one sweep to avoid wave marks. The first action is a complete blackening of the film; this change being quickly followed by the film turning quite white. When this point is arrived at, the plate should remain a few minutes longer in the solution, and then put to wash in a perfectly clean dish or washer, to which not a particle of hypo must cling. The negative is now ready for the final process, for which either ammonia or sulphide of ammonium or sulphite of soda solution may be used. The latter if used too strong, will destroy the intensification as soon as produced. The sulphide is very foul-smelling. Ammonia will do all that is required. Hence we would elect to make the blackening solution simply as follows:—

Strong ammonia solution .....One drachm.
Water .....Half a pint.

The whitened negative is placed in a dish, and this solution poured over it. In a minute or two the whole film, from back to front, is, by reflected light, quite black, and a steely black by transmitted light. A brief washing or rinsing is all that is now needed, and the negative can be put up to dry in the usual manner.

It will not infrequently happen that the amount of intensification is too great, and the negative too opaque for printing. All that is necessary is to immerse it in weak hypo—the ordinary fixing bath mixed with three times its bulk of water will answer. The plate must be examined from time to time, and taken out when the exact required intensity is reached; copious washing should then follow; it is needed as much as, or more than, after the ordinary "fixing." It may be thought that the slight washing we recommended after the ammonia will be insufficient on account of the chloride of silver dissolved in the ammonia which all (or most) of the text-books state occurs. Such solution is a figment; it does not occur at all even with stronger solutions of ammonia than are ever likely to be used. We refer to this, a matter of some moment, for our readers are aware of the importance we have always attached to every reasonable step towards insuring permanency being taken at every stage of photographic manipulations.

In conclusion, we can only repeat that this simple process is, to our knowledge, largely used in important establishments, and all who so use it speak in high terms of the excellence and permanency of results and the great ease and simplicity of the operations involved.

THE SOLUBILITY OF HYPO.

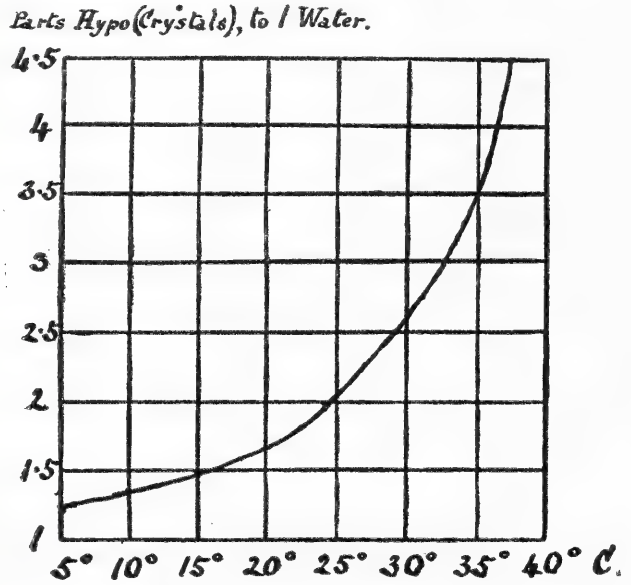
Tables of Solubility which appear in most photographic annuals are commonly referred to in discussing the maximum solubility of some particular salt. One occasionally observes an aspersion cast on some formulist because his formula needs a greater quantity in solution than such tables warrant. "This formula," it is said, "requires so many parts of such-and-such a salt per one part water, but this is considerably in excess of the quantity soluble." Probably some mild sarcasm follows anent the advisability of trial before publication, and such irony may or may not be justifiable, its applicability depending upon the particular case. The solubilities tabulated do not all seem to have been determined with equal care, and it is sometimes inadvisable to settle the question of maxima by quoting the figures given. Unless it is explicitly stated that maximum solubilities are scheduled, it may be better to assume the quantity stated dissolvable, without the inference that solutions of greater strength are unattainable.

As an instance of what is meant there may be mentioned a few experiments in the apparently simple, yet really complex, operation of solution, with hypo—more grandiloquently known to chemists as sodium thiosulphate. In the Almanac this is rightly termed "deliquescent, very soluble," but it usually appears as "soluble in 1·5 parts cold, or 1 part hot water," one part of the salt being taken. Such is the influence of a definite statement that one is liable to overlook the possibility of its being figurative in more senses than

one, and certainly this does not appear to represent the maximum solubility of hypo.

Hypo crystals contain a good deal of water. One-tenth of a gramme-molecule (24·83 grammes) contains half a gramme-molecule of water (9 grammes), and is a convenient unit for purposes of experiment. Operating with this amount, about 1·25 parts hypo were found to dissolve in 1 part distilled water at 5° C (41° F.), which certainly corresponds to what is termed cold water, though the solubility is in excess of that mentioned above. At the other extreme, water at 50° C (122° F.), induces hypo crystals, when immersed in a water bath at this temperature, to deliquesce. We are bound to assume, therefore, that at about this temperature, a small quantity of water simply facilitates deliquescence.

A method of arriving at the solubility at intermediate temperature, is by adding known weights of crystals gradually to a known weight of water maintained at a fixed temperature until solution ceases, but in this case evaporation continually disturbs the ratio between the amount of salt dissolved and the amount of water present. For instance, 24·4 grammes hypo crystals were dissolved by degrees in what was originally 8·5 grammes water kept at 30° to 35° C. without apparently reaching the limit. When weighed it was found that presumably half the water had evaporated, leaving a solution of the strength 5·7 hypo to 1 water, which readily crystallised on introducing a warm thermometer. This shows that at the temperature named the amount of water present need be very small to effect solution.



Crystallization of Aqueous Solutions of Sodium Thiosulphate.

A less tedious and more convenient method is to note the highest temperature at which minute crystals appear in the cooling solution whilst stirring with the thermometer. It is, however, open to the objection that crystallisation, especially with highly saturated solutions, is somewhat inconstant as regards temperature. A curve so obtained indicated that up to 20° C. (68° F.) the weight of hypo crystals in saturated solutions is but slightly augmented. From 20° to 35° C. (95° F.) the amount increases more rapidly, and at higher temperatures added water soon becomes almost negligible in quantity. A solution of 12·5 : 1 failed to crystallise whilst stirred, above 45°C. (113° F.), and super-saturated solutions behaved in their usual abnormal fashion. Large crystals, for instance, began to grow slowly from the thermometer at 34° C. in one of 55 : 1, and another of 45 : 1 could not be induced to crystallise before 30° C. was reached. Here, then, we have a variety of hypo solubilities unindicated in the tables. Before dismissing the subject, it may, however, be mentioned that it was doubtfully observed that a circular crystallisation appeared to liberate less heat than normal crystallisation, perhaps because equal bulks of acicular and normal crystals could not be readily compared in a given time. If, however, this is really the case, the reappearance of normal crystals in the felted acicular mass which sometimes occurs (in one case splitting the test-tube) would doubtless account for the balance of heat (cf. prismatic sulphur into rhombic octahedra, &c.). Such matters have no direct bearing on photography, for the usual thirty to forty per cent. fixer is not likely to give rise to the phenomenon.

J. Dormer.

MODERN ASTRONOMY AND ASTRO-PHOTOGRAPHY.

At the Photographic Club, on February 20, Mr. C. Ray Woods, of the Cape Observatory, gave a chat on the subject of "Modern Astronomy," with special reference to astro-photography as carried on at Cape Town. Before commencing his address, Mr. Ray Woods expressed his pleasure at being able again to meet so many of his old fellow members after an absence of eleven years. Getting on to the subject of the evening, he showed a photograph of a portion of the sun, by Jansen, the great astronomer. Then followed a group of those taking part in the eclipse expedition to the Caroline Islands in 1883, and a photograph of some of the instruments used. Referring to the solar corona, Mr. Ray Woods alluded to Huggins' suggested method of photographing the solar corona without an eclipse, which in Switzerland he had tried with promising results. But in 1886, Captain Waterhouse at the West Indies and himself at the Cape, knocked the bottom out of the idea. The speaker would rather it had been otherwise, but the fact remained that it was a thing yet to be accomplished. A photograph of the moon with a telescope of moderate power was then shown, followed by a slide of the planet Mars, to show the rotation of the planet. There had not been much success in the photographing of the planets, because plates were not rapid enough to enable an exposure to be given that was quick enough to overcome the variations in the atmosphere which affected the definition. Jupiter, with one of his moons, was next shown. Piazzi Smyth at the Cape made a curious caricature, which was shown, of Sir J. Herschel, who was represented as viewing seventy years ago the inhabitants of the moon from the Cape station. A drawing of the planet Saturn, was next projected. Looking through a telescope no such beautiful view as this was to be seen at one time. It required many years of close study to produce a drawing so fine in quality and execution. Mr. Woods next showed photographs of the planet of 1882, Jupiter and its satellites, the latter being in the form of six exposures on one plate, with a movement of the instrument and an interval between each exposure, and useful in the determination of the distances between the planet and the satellites. There was an advantage about this method, inasmuch as the observation of all of the satellites takes place at the same moment, and considerable calculation is avoided. Mr. Woods then referred to the great work of mapping the heavens started by Dr. Gill at the Cape Observatory. A number of photographs forming part of this collection were displayed. It was originally commenced on a comparatively small scale, but is now being done on a more pretentious scale. The means adopted to facilitate the measuring of the distances separating stars and other heavenly bodies was gone into. A series of cross lines are produced upon the sensitive plate by exposing it in contact with a piece of plate glass, silvered on one side; through this silver coating fine lines are cut by means of a diamond carefully regulated by means of a screw. Each of the spaces enclosed by these cross lines is carefully and separately measured so that any errors may be detected, and a corresponding correction can be applied. A view of the Cape Observatory, showing the slit opening in the roof to allow of the movement due north and south of the transit instrument was projected on the screen. Most of the astronomer's work depends upon the observations made with the transit instrument. Some interesting facts regarding the time required for the light from different stars to reach the earth, were elicited. Three and a half years was the period required for one star in the southern heavens that was pointed out, equal to 40,000,000 years for an express train at full speed. The heliometer, and its building, at the Cape were also shown. This affords the most accurate means of determining the angular distances of any two bodies in the sky. A picture of the milky way was shown, or, at least, so much of it as would be covered by a shilling at arm's length. It received five hours' exposure, and compared with other similar photographs taken with longer and shorter exposures was most interesting, as showing the enormous number of stars that was included in such an area. The difference between the photographs in point of the number of stars represented was most marked, comparing that taken in five minutes, with that exposed for several hours. Mr. Woods next made some references to the use of the spectroscope in astronomical photography. By its aid it becomes possible to decide whether, at a given time, a star is travelling towards or away from the earth, the point being settled by the wave length and its alterations. Mr. Frank McClean has recently set up at the Cape a new telescope specially for spectroscopic work, at a cost of £15,000. Mr. Woods dipped deeply at times into the principles of astronomical work, into which it is out of the question to follow him in a brief report like this and without the instructive illustrations that accompanied his remarks.

EXHIBITION OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The Annual Exhibition of the South London Photographic Society is an event of importance in the photographic world. There are many societies in the London district which hold exhibitions equally deserving of praise for the way in which the members work together for the advancement of their own particular Society and the honour of photography, but the South London and the Hackney Societies, favoured, perhaps, in this matter by their geographical situations and local conditions, are enabled to hold exhibitions upon a scale which few other societies are able to attempt. We look to these societies to give us exhibitions which will serve as models in exhibition organization and management, and, it must be admitted, they have fulfilled their obligations.

The Twelfth Annual Exhibition of the South London Photographic Society, which was opened on Saturday last by the Mayor of Camberwell, and which will remain open until Saturday, the 9th inst., was held, as usual, at the Public Baths, Church-street, Camberwell, and we have every reason to congratulate the Society upon having once more achieved a success. The work in the Members' Classes was quite up to the usual standard of excellence, and the Open Classes were in advance of last year, both in regard to the number of pictures sent in and in the average quality of the work.

The South London Society are unrestful souls with regard to the arrangement of their classes. Every year they seem to realise that there was something not entirely satisfactory in the previous year's classification. They are, however, drifting towards the rational method of classifying according to subject, and we hope that the result of the Judges distinguishing the Hand Camera Class by not making an award in it will encourage them to abolish a class which, in our experience, rarely makes anything but a poor show. The Open Class was, this year, divided into three, and to this division some of the Exhibition Executive attribute the increase in the work sent in.

In the Members' Class for portraiture, figure studies, animals, flowers, fruit, and still life, a comprehensive enough class truly, there seemed to us dawning a clearer perception on the part of some of the members of the conditions which are to be complied with in the pictorial treatment of portraits and figures. Amateurs generally, as we know, are not very successful in such subjects. When they attempt to imitate ordinary professional work they, too frequently, copy its worst features with unfortunate faithfulness, and when they do not take this course they rely too much upon methods which may often be successful in making excursion pictures, but which are not exact enough for subjects in which a single misplaced line may mean failure instead of success. It is satisfactory to find that several of the pictures showed that a serious attempt had been made to deal with their material deliberately. Two bronze medals were awarded. The best work was by A. E. Allen, C. W. Walker, T. Morley Brook, W. H. Rogers, and T. Moyser. A little judicious weeding out would have materially improved the average quality of the work in the class.

In architecture, the Society does not quite appear to maintain its ancient reputation. The absence of anything by the President is felt, of course, but he takes a wise and dignified course in competing in a wider arena. The pictures of Frank W. Gregg, one of which received a silver medal, were all wonderful examples of the preservation of tone values in difficult subjects.

The Landscape Class, naturally the largest, contained a fair proportion of interesting pictures, but there were a few it was hardly kindness to their authors to exhibit at all. We noted particularly pictures by E. W. Taylor, T. A. Price, T. Moyser, G. J. T. Walford, C. W. Walker, and G. Pinker. The last-named had a flagrant example of the misuse of the brush.

The Hand Camera Class was a poor one. No award was made, and the only picture we marked was by J. T. French.

The Excursion pictures were so good that they almost justified the existence of the class. The most noteworthy contributors were T. Lee Syms (we cannot say we consider the scale of tones he adopts a justifiable one), G. Brown, J. T. French, T. Moyser, and C. W. Walker. The pictures which have received medals during the year, 21 in all, showed that the Society takes a high place in open competitions. Naturally, it was the best class on the members' side. A gold medal, offered by Mr. G. A. Maull, was awarded to W. E. Dunmore for "Dear, Dirty London." The other exhibitors were E. R. Bull, E. R. Collins, C. F. Dickinson, A. V. French, W. Howell, E. Matthews, W. Page, G. J. T. Walford, J. K. Ayling, and C. W. Walker.

The Open Class for Portraiture formed an interesting collection, including work by W. Illingworth, T. Lee Syms, J. Leslie Shawcross, T. Morley Brook, E. Matthews, Graystone Bird, Evelyn Boden, E. W. Burch, A. E. Lane, J. G. Mainds, and W. McLean.

The architecture was, on the whole, good, the members of the Society exhibiting here doing well. The only medal awarded was to C. H. Oakden.

The Landscape Class was a large and representative one. Here there was a case of one board of Judges reversing the recent decision of another board, which is worthy of comment. At the recent Croydon Exhibition there were two pictures, also competing here, "A Bit of Holland," by W. H. Rogers, and "The Torrent," by C. E. Walmsley. At Croydon the former received a medal, and, here, the latter. At Croydon they were in a brilliantly lighted gallery constructed for art exhibitions. There, we entirely agreed with the Judges' decision. Here, the lighting was of an entirely different kind. It was very much more subdued, and one picture gained and the other lost by the alteration of condition to an extent hardly realisable. Here we also entirely agreed with the Judges' decision. In the class we noted pictures by W. Rawlings, T. A. Price, E. W. Burch, E. J. Hunt, C. W. Walker, Graystone Bird, and S. C. Stean.

The lantern slides in both Open and Members' Classes were numerous, and of good quality.

The trade exhibits have always been a feature at South London Exhibitions. This year the stalls were more numerous, and seemed to us even more interesting than usual. Among the stall-holders and trade exhibitors were J. Ashford (Birmingham), the Autotype Co.; R. and J. Beck, Ltd.; Griffin and Sons, Ltd.; A. J. Harris (London, S.E.); M. Howell and Sons; Kodak, Ltd.; Mackenzie and Co. (Glasgow); Mann's Photographic Stores (Peckham); Rogers and Webster (High Holborn); A. Rosenberg; Rotary Photograph Co.; Seabrook Bros.; R. W. Thomas and Co., Ltd.; W. Tylar (Birmingham); W. Watson and Sons; T. Webster; W. D. Welford; J. and A. Wilkinson; Wolfsky and Co., and R. R. Beard.

There were the usual lantern and other entertainments, and the catalogue was well got up. We regret to be obliged to repeat our protest of last year as to the size of the numbering labels and the careless way they were affixed to the pictures. The way some of the pictures were treated almost amounted to vandalism.

The Awards.—Members' Classes.

Class A (Portraiture, &c.).—Bronze, A. E. Allen and C. W. Walker.

Class B (Architecture).—Silver, Frank W. Gregg; bronze, G. R. Nicholls.

Class C (Landscape).—Silver, E. W. Taylor; bronze, T. A. Price.

Class D (Hand Camera Work).—No award.

Class E (Excursion Pictures).—Silver, T. Lee Syms.

Class F (Lantern slides).—Bronze, W. H. Dawson; bronze, S. W. Whiteman.

Class G (Pictures Medalled since last Exhibition).—Gold, W. E. Dunmore.

Open Classes.

Class H (Portraiture).—Silver, W. Illingworth; bronze, T. Lee Syms; bronze, J. Leslie Shawcross.

Class J (Architecture).—Bronze, C. H. Oakden.

Class K (Landscape, &c.).—Silver, C. E. Walmsley; bronze, W. Rawlings.

Class L (Lantern slides).—Silver, F. E. Roop; bronze, C. F. Dickenson.

Class M (Stereoscopic slides).—Bronze, L. S. Wilks.

Silver Medal for the most interesting Stall.—R. and J. Beck, Ltd.

Bronze Medal for the best Novelty.—J. Ashford, for Newford's carrier and exposing slide.

LANTERN SLIDES AT THE CROYDON EXHIBITION.

Of late years there has been a growing disposition to overlook the claims of the lantern slide, perhaps because of the tendency to over-estimate the value of the pictorial print. Especially is this the case with not a few exhibitions. The Croydon Camera Club, has, however, always made the lantern slide a leading feature, of which the bald statement that in the past ten years over fifty public lantern shows have been held is sufficient evidence. Hence no doubt why nearly two hundred slides were entered for competition at the fourth Exhibition just held. It is well competitors should know that on every one of the eight evenings during the Exhibition all, or some, of the competition slides were shown on the screen to large audiences. We can hardly particularise all the meritorious studies displayed, because, besides the competition ones, there were others more or less noteworthy, numbering in all over 1000, which were projected. We should here like to note that the appearance of the slides suffered nothing by the way in which Mr. N. G. Druce handled the lantern, &c. Indeed, Mr. Henry Speyer, who is not one to be satisfied with anything second rate, expressed, in our hearing, that his slides had never before been so well put on.

In the Open Classes we were greatly struck with the clever and interesting set by Mr. Graystone Bird, of which "Breaking the News" received deserved favour; some fine and striking lightning studies by Mr. William Archibald, of U.S.A.; and some almost unique natural history pictures by Mr. Douglas English, of which "Dormouse" was the most popular. The longer series, not for competition, included

"The Rhine," in which the slides were, on the whole, most praiseworthy. "A Holiday in Devonshire," by Mr. Holland, was much applauded, as also were "The Paris Exhibition," by Mr. Bynoe, and "The Channel Isles," by Mr. Isaac. Mr. Sandell showed a series of his finished "Windsor Scenes," which were unusually perfect examples of architectural work. This may also be said of Mr. G. W. Watson's "English Cathedrals." Mr. Stanley Docking contributed some capital snap-shots taken by himself in South Africa, and illustrating war episodes, and Mr. Baldock displayed some delightful flower studies, mainly orchids belonging to the late Mr. Philip Crowley. Councillor Noaks showed us his photographic mementoes of the Photographic Convention at Newcastle, including some charming peeps of Jesmond Dene. The finest serial collection was that displayed by Mr. Henry Speyer, of Reigate, on Monday. Mr. Speyer seems to possess an equal facility for climbing high and break-neck mountains, and for producing unexcelled photographs at enormous altitudes. It is impossible even to summarise this pictorial survey of a veritable land of enchantment, but we would record that one of the mountain peaks shown was stated to have been 120 miles distant, surely the record for long-distance landscape work? Another lecturette which was alike notable for sound photographs and sound sense was that in which Dr. Male explained the life on board the "Shaftesbury," showing how the unruly gutter snipe or incurable truant is taken in hand, educated, disciplined, and finally turned out as a Jack Tar, a Tommy, or other useful member of society.

On the concluding evening the President showed a series of views depicting various portions of the Old Palace, which, with the explanatory remarks, created much interest. Some of the slides were greatly admired.

Williamson's Moving Photographs, which formed the last turn, were the source of absorbed interest, and received the warmest of applause, which they well deserved.

During each evening portraits have been taken by means of the oxy-magnesium lamp. In all some hundreds of exposures were made. On the last night the crush in the studio was so great that operations had for a while to be suspended. The X ray room, in charge of Mr. Watson, who used apparatus most kindly lent by Mr. D. P. Roberts, North End, proved also a never-ending source of interest.

Since the opening various minor additions have been made, the latest of these being a copy of the late Mr. H. P. Robinson's renowned composition, "When the Day's Work is Done," which, although produced over forty years ago, quite holds its own with the modern pictorial suggestions.

EXHIBITION OF THE WOOLWICH PHOTOGRAPHIC SOCIETY.

THE Sixth Annual Exhibition of the Woolwich Photographic Society was held at the St. John's Lecture Hall, Wellington-street, Woolwich, on Thursday, Friday, and Saturday last.

The pressure of work at the Royal Arsenal, with which many of the members of this Society are connected, at this time last year, on account of the war, rendered it impossible for the Society to organize its usual annual exhibition. With the knowledge of this fact, our anticipations of the success of this year's exhibition were not altogether hopeful, for photography is a pursuit which requires both leisure and continuous practice. We are pleased to say that our pessimistic forecast was in no way confirmed, and that, instead of there being signs of retrogression, there was evidence of increased skill on the part of the exhibitors.

It was a bright little Exhibition, nicely arranged, and containing sufficient good work to be interesting even to such jaded exhibition haunters as ourselves. As far as our observation could go, none of those little matters connected with the organization of an exhibition had been neglected, which one frequently finds have not been provided for owing to hurry or want of foresight. In hanging the pictures, those responsible had adopted the method of separating those with white or light mounts from the others. In this way a difficulty which is generally dealt with in a more or less unsatisfactory manner, was successfully overcome. There was a gain in the general harmony of the collection viewed as a whole, and, what is of even greater importance, the hanging of the pictures so that they did not mutually destroy one another's effect was possible. An incidental and probably unintentional result of the arrangement was that it practically provided a line of demarcation between the work of the experienced photographers and that of the beginners.

Some of the exhibitors had not yet realised that, as a rule, a glossy chloride print, framed with a light mount, does not do justice to the negative from which it was printed when the result is hung on the walls of an exhibition, and this applies more particularly to any photograph of more than the smallest size. The most merciful way to treat such exhibits is to hang them together, but, even under these favourable circumstances, which existed here, there was ample opportunity to make observations in confirmation of our assertion. Those exhibitors who have need of this experience in preparing pictures for exhibition will, no doubt, profit by their lesson. We do not deprecate the use either of glossy paper or of white mounts, but both should be used with judgment; neither do we wish it to be understood that there was actually a dividing line between the good work and the bad. There were some commendable pictures on the light mount side, and some not deserving commendation on the other side.

Such an arrangement as that we have referred to is, of course, only possible where an exhibition is not divided into classes, and we are certain the Woolwich Society acts wisely in relying upon the esprit de corps of its members to maintain the success of its exhibitions without the unwholesome stimulus of medals or awards.

Among the pictures we marked on our catalogue were those of J. W. Machen. "When the Leaves Fall," would certainly have been the best had its effect not been marred by a disastrous sky; "Oaks," also a forest scene, suffered from want of a sky, which might have been made to modify the horizontal lines of the branches; "A Village Street," was a quaint subject well treated. C. Churchill had some excellent architectural studies printed in platinum, which were quite free from the prevailing faults of most of the architectural work here. Bromide enlargements of such subjects seem rarely to be successful, they are generally distressingly flat, or distressingly hard. G. Japp had a good subject in "A Silvery Glade," as a picture it was spoilt by a weakness at the upper part, which might have been remedied in the enlargement Harold H. Barker's "Cobham Woods," was a very fine picture, its slight defects might be removed by a perfectly legitimate use of the spotting brush. One of the few figure subjects was "A portrait in Profile," by Douglas English, really a very charming picture. It would have gained by the omission of the white line surrounding it. "Crépuscate," by the same author, a rather ambitious attempt and a good subject was completely false in its tones. Other noteworthy pictures were by S. Hughesdon, W. F. Slater, J. Cregan, J. Borthwick Panting, N. G. Groves, W. H. Dawson, G. Meinertzhagen, J. Hope, J. Calder, C. E. Burch, and J. Disforges.

The lantern slides were of good quality generally. An interesting exhibit was described as "an example of silver printing (1846, sitting occupied half an hour)." It was a very pretty little print daintily coloured in water colours, and in perfect preservation. We should imagine it was antedated a few years, and that the time of sitting, though it may have seemed half an hour to the sitter, was, in reality, much less.

Our Editorial Table.

THE "ROTOGRAPH" DEVELOPER.

Manufactured and sold by The Rotary Photographic Co., 23, Moorfields, E.C.

FOR use with bromide papers, plates, and films, the Rotary Photographic Company are sending out ¼, ½, and 1 lb. tins, containing a citrate of iron developer in powder form. With the quantities named three-quarters of a pint, 1½ pints, and three pints of solution are respectively made. Cleanliness, freedom from stain, bluish-black tones and pure whites are the claims made on behalf of the developer. The directions for use are as follows:—Dissolve 5 ounces of powder in a pint (20 ounces) of water (preferably soft, or other water containing little or no lime), and shake until the solution, which is at first turbid, becomes clear. There is no need to filter. It is best to prepare the solution at least half an hour before it is required, so that it may return to the ordinary temperature of the room—60 to 65 degrees Fahr.—at which it should be used. The solution keeps well in closed bottles (in daylight), and can be used over and over again; or one part of fresh solution can be mixed with two parts of used developer. In the dry state—as supplied in tins, the developer keeps indefinitely. The developer is suitable for any bromide paper. By adding a few drops (one or more per ounce) of ten per cent. solution of potassium bromide, it is easy to make more brilliant prints. There is no need to use a clearing bath after development if the prints be well rinsed, but where there is not an ample supply of water a bath of acetic acid (one part of glacial acid to 100 parts of water) should be used.

CATALOGUE RECEIVED.

Henry M. Ward, 41, Belgrave-avenue, Leicester.

THE latest price list of Mr. Ward, one of our most competent enlargers, has just reached us. A copy will be sent free to any one of our professional readers on application. The particular speciality of Mr. Ward is the Sepia bromide, which he produces very effectively; indeed, for warm-toned work he has acquired an excellent reputation that he thoroughly well deserves, for the work is not only good, but it is promptly delivered—a convenience not to be despised in these high-pressure times. Opals and lantern slides are also branches of Mr. Ward's business. We have much pleasure in recommending his services as a trade photographer and enlarger.

Studio Gossip.

Mr. George Henry Thwaites, photographer, of Petergate, York, having secured an excellent picture of the recent proclamation ceremony in York, forwarded a copy to the King, and has now received through the Private Secretary his Majesty's acknowledgments and thanks.

Last week the Duke of Cornwall and York honoured Messrs W. and D. Downey with a visit to their studios, and was photographed in the uniform of an admiral.

Mr. A. Seaman, of Chesterfield, who has been very ill with influenza and bronchitis, is declared by his doctor to "have passed the worst." He writes in hopes of being present at yet another Convention. We hope that Mr. Seaman will be present at many more such meetings.

Paganini's Photograph.—The New York "Musical Courier," prints a reproduction of the photograph of Nicolo Paganini, a violinist of whose grotesque appearance a wild and vague impression lurks in the mind of every musician. Paganini died some sixty years ago; but only recently did chance bring to light, in Turin, an old Daguerreotype of the eccentric fiddler. This relic has been carefully photographed, and the result shows Paganini himself, with all that wealth of nose, chin, and hair which tradition has assigned to him. The portrait, it is claimed, differs materially from all paintings and sketches of the violinist that have been handed down to us. But it is certainly not less weird than other more or less authentic presentments of this "diabolically fascinating" performer. "This picture," it is stated, "must have been taken shortly before Paganini's death, as he died May 27, 1840, and Daguerre did not discover his process of taking photographs till 1838, and it was not put to practical use till 1839." It is certainly curious that the portrait should have remained undiscovered so long.

Discovery of Old Masters.—One is continually reading of the discovery of the works of the old masters in the most out-of-the-way places and, often, under the most extraordinary circumstances. The latest discovery is said to be that of a Rembrandt, depicting "an interview between Antony and Cleopatra." This discovery, it is stated, has been made by a Belgian painter, "in the hands of an obscure Belgian family, who did not suspect its value." It is to be hoped that it is really a Rembrandt, for there are not too many of them in existence. However, these "discovered" old masters are not always genuine. Here is a case in point. The Berlin correspondent of the "Standard," telegraphing one day last week, says that the painting attributed to Raphael to which he referred a few days before, has been sold by auction, and it realised six thousand marks. It was purchased by a gentleman who had lent about eighty-six thousand marks upon it. In the opinion of connoisseurs the picture is not a Raphael at all, but the work of a contemporary artist. This is no uncommon thing with these unexpected discoveries, as some have found to their cost. It is said that there are more paintings by some of the old masters in existence than they ever painted.

Subjects for Photography.—It is extraordinary how many photographers work in grooves in the choice of their subjects. No sooner does one artist make a speciality of one type of subject than, if his work is eulogised, or is medalled, he has at once numberless imitators. During the past two or three years we have had waning days, misty mornings, rainy days, rising mists, birch and brackens, mud-flats and such titles ad nauseam, simply because several pictures of this class met with approval in some quarters. Flower studies seem to have their day, like the subjects just referred to. Some, no doubt, are looking for new worlds to conquer in photography, but where are they to seek? We would suggest one or two that seem to have hitherto been overlooked by photographers, though they have been favourite themes with many painters. Groups of game well arranged have often formed the subject of fine paintings. So have groups of fish—both sea and fresh water—and excellent pictures they make. Groups of fruit, too, seem to be almost overlooked by modern photographers. Some of our older readers will doubtless remember a fine series of photographs that were produced some forty or more years ago. They were taken direct about eighteen by fifteen by. we think, Lake Price, and the fruit was arranged by J. Lance, the celebrated fruit painter. Possibly the hint may be useful to some.

Tanquerey Again.—The latest batch of "Tanquerey" literature contains the following touching letter, issued to more than usually coy victims we suppose: "If you could only be here in our studio and see the beautiful life-size crayon portrait we have made for you after the photograph you so kindly sent us some time ago, you would certainly not hesitate a minute, in forwarding to us the very small amount required to pay for packing, boxing, and all freight charges from Paris to your home. You can easily understand that if we make you a crayon portrait of a value of £4, we, at least, expect you to pay the above charges. As we desire to close this transaction as quickly as possible, we make you the following offer, which we think perfectly loyal. Send us five shillings and for this small amount, which is only a trifle to you, we will guarantee to deliver your elegant crayon portrait in good order to your home free of all charges. If, however, this offer is not agreeable to you, kindly send us the necessary stamps so that we may return your photograph, which is of no use to us. If you have no objection, we will also ask you the permission to use your crayon portrait as a sample in our showroom." The "testimonials" include one from the "Bristol Times and Mirror." We are sorry to see so excellent a newspaper quoted in connexion with this business. There is also one from Lord Penzance, the use of whose honoured name in the affair is much to be deplored.

News and Notes.

Royal Photographic Society.—Ordinary meeting, Tuesday, March 12, at 66, Russell-square, at eight p.m. "The Apochromatic Collinear Lens," by Dr. Harting.

Royal Photographic Society.—On Wednesday, March 13, at 66, Russell-square, at eight p.m., an exhibition of photographs by Colonel J. Gale will be opened by the exhibitor, who will deliver a short address. The exhibition will remain open for about a month, and admission can be had on presentation of visiting card, daily, from ten to four (Wednesdays, ten to eight).

The Southsea Amateur Photographic Society.—Mr. F. J. Mortimer, of 10, Ordnance-row, Portsea, writes us: "The Council of this Society have asked me to again undertake the duties of Hon. Secretary, vice Mr. G. Wood, who has resigned, and although I have plenty of work to do in other directions, I hope to be instrumental in making the Southsea Society more flourishing than ever this year."

A new French Annual.—M. Charles Mendel, of 118, Rue d'Assas, of Paris, the publisher of the "Photo Revue," has in immediate preparation an international annual comprising addresses of all the dealers and manufacturers of photographic goods, which said addresses will be classified by experts. M. Mendel will be obliged if all dealers and manufacturers will immediately send him their price-lists, catalogues, and any printed matter which may render the work of classification easier. Doubtless many of our advertisers may like to take advantage of this opportunity.

The Warnerke Fund.—Mr. T. Sebastian Davis, of 199, South Lambeth-road, London, S.W. writes: "I have much pleasure in contributing a trifle towards the fund being raised in favour of Miss Warnerke. It seems exceedingly grievous that one possessed of so many estimable personal qualities, talents, and energy as our late friend, Mr. Warnerke, should not have been able to secure a commensurate share of this world's goods to meet the requirements of himself and family." Mr. Davis kindly sends £1 1s.; and we have also to acknowledge £2 2s. from "Lelio," and 5s. from Mr.John Stuart, of Glasgow.

The "L. & P." Annual Supper.—The Third Annual Supper of the London and Provincial Photographic Association was held on Thursday evening, February 28. Mr. Thomas Bedding, F.R.P.S., editor of The British Journal of Photography, presided, and the attendance numbered about fifty, including such well-known photographers as Mr. E. J. Wall, Mr. J. Haddow (The European Blair Company), Mr. James A. Sinclair, Mr. S. Herbert Fry, Mr. A. Haddon, Mr. P. Everitt, Mr. W. E. Dunmore, Mr. P. R. Salmon, Mr. W. D. Welford (Hon. Sec.), Mr. T. E. Freshwater, Mr. R. P. Dr-ge, Mr. H. C. Rapson, Mr. J. S. Teape, Mr. T. K. Grant, Mr. Lewis Medland, Mr. H. Vivian Hyde, Mr. Frank Seary, and others. In reply to the toast of "The Association," given by the Chairman, Mr. T. E. Freshwater pointed to the recent election of fifteen new members as evidence of the vitality of the "L. & P." The toast of "The Officers" was appreciatively proposed by Mr. Grant, and responded to by Mr. Welford (Hon. Sec.), who in his reply acknowledged the loyal manner in which he was supported by the officers and Committee. Other toasts were "Absent Members" and "The Chairman." There was a programme of songs and recitations, and a very enjoyable evening was spent.

Commercial & Legal Intelligence.

Mr. Jonathan Fallowfield, of 146, Charing Cross-road, W., announces his annual clearance sale of surplus goods.

Micro-photographic Lenses.—In reference to a recent query on this subject, Messrs. G. Garet-Charles and Co., of Eden-street, Hampstead-road, N.W., state that these little lenses may be ordered of them.

Fuerst Brothers Price List.—Messrs. Fuerst Brothers, of 17, Philpot-lane, E.C., write: "We have pleasure in sending you a copy of our Photographic Price List for March, and beg to say we shall be happy to supply a copy of same to any photographic dealer on receipt of trade card."

The contractors for the Whitechapel and Bow Railway, now in course of construction, are enabled to work night and day shifts, owing to the amount of light obtained from eight of the Thorn and Hoddle Acetylene Company's Gas Generators, which are sufficiently portable to conveniently meet all requirements.

The Disposal of Old Negatives.—Mr. W. Richards, the Ship Inn, Wallsend, writes: "I noticed in last week's issue that H. F. and Co., are inquiring where they can dispose of old negatives. Would you kindly refer them to me, either through your paper or by post? I had an advertisement in The British Journal of Photography a fortnight ago offering to buy any."

Marion's Sale.—The annual clearance sale of Messrs. Marion and Co., Soho-square, takes place from the 4th to the 16th of March. The catalogue of 110 pages is obtainable on application. It particularises fancy goods of all kinds: frames, purses, cigar-cases, photographic publications, stationery, photographic goods, photographic mounts, photographic cameras, lenses, &c.

Three Months for Fraud.—Charles Smith, a photographer of Grantham, was sent to prison for three months by the Boston (Lincs.) magistrates on Wednesday week, for victimising seventeen persons in the district. His

modus operandi was to pretend to take photographs of public places and individuals, with a bogus camera, for alleged reproduction on the screen at village entertainments, obtain payments in advance, and then decamp. The police said the prisoner had operated in the same manner in other parts of the country.

Messrs. Adams and Co., of 26, Charing Cross-road, London, W.C., have been commissioned to manufacture two of the finest and most luxurious hand cameras that it is possible to produce. The pattern selected is the 1901 Adams de Luxe, and each instrument is to eclipse all records in camera construction, and will cost many hundreds of pounds. As the firm are well known for instruments of a high class nature, they may safely be relied upon to turn them out in such a manner as will undoubtedly be a credit to London made photographic apparatus. When finished they will be submitted for our inspection, and we then hope to give our readers further interesting particulars.

The Thornton Pickard Manufacturing Co., of Altrincham, have just recently supplied—by Royal Command—His Majesty the King of Portugal with a thirteen by eighteen cm. "Ruby" camera and complete outfit, with which His Majesty has expressed his pleasure, and has also sent the company a platinotype print of a "Moonlight Scene," taken by himself from one of the palace windows at 1.30 a.m. The company have also recently supplied a twelve by ten "Ruby" outfit to His Excellency the Viceroy of India's official photographer, who accompanied him on his recent tours through the country, and their customer in ordering it through his shipping house says: "Passing over all other makes of cameras, I request you to obtain for me a Thornton-Pickard "Ruby."

The Coming Budget.—Speculation is general, just now, as to what new taxes are likely to be levied by the next Budget. There is no question that money has to be raised somehow or other, and before now the taxing of photography has been mooted. We remember a cartoon in "Punch," last year we think it was, by Mr. Linley Sambourne, and it indicated in the picture, a number of things that might possibly meet the attention of the Chancellor of the Exchequer, and, amongst them, cycles and cameras figured conspicuously. Of the latter, no less than three were depicted. On more than one occasion, lately, we have heard the subject mooted amongst photographers, and the question raised as to how the imposition of a tax, whether as a license on cameras, or an affixed penny stamp on the prints, would affect the profession. In some cases it would undoubtedly press hard, particularly upon those who produce pictures at a very cheap rate, unless the cost of the stamps could, as it is with patent medicines, be charged to the customer. With the better class of artists, who charge high prices for their work, it would not press so heavily. One thing that would be materially affected would be the system that is just now being introduced by soap makers, tobacconists, and the like, of supplying reproductions at half-a-crown a dozen. In this case a tax would benefit the profession rather than otherwise.

Messrs Newton & Co., of 3, Fleet-street, E.C., announce the issue of the following lantern slides of the funeral of Her late Majesty Queen Victoria, and the Proclamation of King Edward VII. Most of the slides are copied by permission of the proprietors of "The Illustrated London News" from their original drawings. The photographs are from negatives taken by Messrs. Bulbeck and others:—The latest portrait of H.I.M. Queen Victoria:—Scene in the Mortuary Chapel, Osborne. The start of the Funeral Possession from Osborne, the King and the Royal Mourners following the Gun Carriage. The Royal Mourners following the Bier at foot. The Procession in Osborne-avenue, Queen Alexandra and the Royal Princesses following on foot. The Royal Yacht "Alberta" passing through the Solent. The Royal Yacht "Alberta" with the Royal Catafalque entering Portsmouth Harbour, passing H.M. Training Ship "St. Vincent." The King and the Kaiser leaving Victoria Station. The Crowd at Hyde Park Corner (photo). The Funeral Procession. The Bluejackets marching to the Railway Station at Windsor (photo). The Bluejackets drawing the Gun Carriage from the Railway Station (photo). The Bluejackets drawing the Gun Carriage in the Quadrangle at Windsor. The Queen's last journey—The Guards and the Funeral Cortege leaving Windsor for Frogmore. "In Memoriam"—The World's Tribute. H.I.M. King Edward VII. H.M. Queen Alexandria. The Proclamation at St. James' Palace, and Temple Bar. The King in Council, His Majesty subscribing the Oath for the security of the Church of Scotland, St. James' Palace.

Patent News.

The following applications for Patents were made between February 18 and February 23, 1901:—

Colour Photography.—No. 3439. "An Improvement in the Practice of the Three-colour Line System of Colour Photography." Edward Douglas Fawcett.

Swing Backs.—No. 3696. "Improvements in or relating to the 'Swing Backs' of Folding Cameras with Taper Bellows." Perken, Son, & Co., Limited, and Edgar Theodore Perken.

Printing and Developing Appliance.—No. 3747. "A Combined Appliance for the Printing and Developing of Photographic Papers; also applicable for the Developing of Plates and Films." William C. A. Ross.

Exposure Meter.—No. 3873. "Improved Apparatus for estimating Photographic Exposures." J. J. Acworth.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
11	Bradford Photo. Society	*Ives' Photochromoscope.* A. H. Ormerod.
12	Aintree	*Highways and Byways of Venetia.* S. L. Coulthurst.
12	Birmingham Photo. Society	*Clouds.* C. T. Cox.
12	Leicester Literary	Demonstrations: *Gaslight Printing,* J. Porritt; *The Aphengescope,* F. R. Rowley, F.R.M.S.
12	Manchester Amateur	*Figure in Landscape.* G. E. Mellor.
13	Borough Polytechnic	*Hand-camera Work from Start to Finish.* A. Horsley Hinton.
13	Croydon Camera Club	Some Lessons and Criticisms suggested by the Exhibition, opened by the President.
13	Darwen	Lantern Slides.
13	G.E.R. Mechanics Institution	Slides: *Trip on Rhine.* South London Society.
14	Hull	*Silver Printing and Toning.* W. S. Parrish.
14	Liverpool Amateur	*Pinhole Photography, with Practical Illustrations.* Dr. Llewellyn Morgan.
14	London and Provincial	Open Night.
14	Oldham	*The War in South Africa.* A Member.
14	Woolwich Photo. Society	*Flashlight and Home Portraiture.* C. Churchill and J. B. Panting, F.R.P.S.
15	Aberdeen	*Relief Photography.* J. Glass.
15	Bognor	Monthly Competition.
15	Croydon Microscopical	Demonstration: *Velox, Kuchin,* &c. Messrs. Griffin.

ROYAL PHOTOGRAPHC SOCIETY.

Lantern Meeting, March 5,—Mr. J. J. Vezey, F.R.M.S., in the chair.

It was undoubtedly the largest audience that the Society has had since its removal to Russell-square, that attended to hear the lecture by Mr. W. B. Ferguson, K.C., M.A., on "Rome."

fully one hundred and fifty people being present. Mr. Ferguson's lecture was of the chatty description, every slide forming a hinge upon which was hung some appropriate story or interesting fact. The old Roman roads were exemplified by several pictures of the Appian way, which seems to be a veritable quarry for the modern builder who, with the inevitable relic hunter, is doing his best to despoil the grand old structures erected in old times, and upon which the attractiveness of Rome and similar cities so largely depends. But while such spoliation undoubtedly openly goes on, as Mr. Ferguson remarked, good sculpture and good architecture and splendid engineering, though knocked about, cannot easily be robbed of its beauty. Photographs of many an historic building were shown, bearing evidence of the keen modern economical spirit which has allowed valuable masonry to be smashed and defaced, that the copper and iron bolts may be recovered and turned to profit, but the beauty of the venerable piles seems not to be affected in any way. The various city gates, with their interesting towers; the remains of the great walls; the tombs and catacombs; and the superb aqueducts of the old Roman age formed the subjects of a number of fine pictures. In spite of the enormous damage done to these fine old aqueducts, which the lecturer compared to some of the devices of the present day for the conveyance of water to our towns, the five remaining aqueducts still supply far more water than Rome can ever require. The amount that runs to waste would astonish one. Amongst the streets of Rome Mr. Ferguson managed to pick out many groups of the modern Roman, whom it would be uncharitable to compare in detail with his progenitor; fountains, hawkers, and so forth in the picturesque attitudes which these people can so well and easily affect. The general views of Rome were very well done—showing the Tiber, the tower of Nero, the many churches, St. Peter's with its famous dome, the arch of Titus, the Colosseum, the arch of Constantine, &c. The old temples have, in many cases, been annexed where their structure, condition, and form allow, and converted into Christian churches. The Ghetto quarter, with its Hebrew inhabitants, afforded several picturesque photographs, and the closer and more detailed views of some of the historic edifices alluded to, as seen in the general views, gave scope for a lot of work which held the interest and attention of the audience to the end. A hearty vote of thanks to Mr. Ferguson brought to a close one of the most successful meetings that the Society has had in the new house.

PHOTOGRAPHIC CLUB.

February 27,—Mr. Hans Muller in the chair.

Mr E. W. Foxlee showed a lens by Morrison, of New York, which was referred to at a meeting a few weeks ago. The back lens was a single glass, and Mr. Traill Taylor mentions in his work on photographic optics that different back glasses were used with this lens to alter the focus

of the combination. The front lens is a very deep meniscus. The lens, as a whole, is about three and a half inches in focal length, and is supposed to cover a plate measuring eight by five. The speaker mentioned that he had taken a negative on a seven and a half by five plate, which was very fairly covered with a small stop. Mr. Foxlee also showed the casket of lenses by Darlot—a quarter-plate set very ingeniously arranged. There were originally ten supplementary lenses, but he had added four more. Provision is made upon the lens mount for shifting the position of the diaphragm. Where two lenses of one focus are in combination, the stop is placed midway between, but if there is a lens of shorter focus at the back there will be a lack of rectilinearity unless the stop be moved nearer to the shorter focus lens. There is also a provision for lengthening or shortening the tube, according as you are using a wide or narrow angle lens. The supplementary lenses vary in focus from three to eighteen inches, and the combinations from one and three-quarters to ten inches. The shorter focus lenses are mounted in deeper cells than the others, so that they come into a proper position. The whole set is extremely well devised, and is at times useful. Considerable amusement was caused by the reading of a newspaper paragraph describing the building of a mammoth camera in the States for the purpose of photographing a train, which it was apparently supposed could not be photographed with a smaller instrument. The lens is claimed to be the largest ever made. The taking requires the services of fifteen men, and an exposure of two and a half minutes seems to have been required. The whole paragraph is of the ridiculous character that too often disgraces the lay press when it dips into scientific matters.

Bath Photographic Society.—On Wednesday, February 26, an open meeting of this Society took place, when Mr. Walter D. Welford, F.R.P.S., of the Thornton Film Company, gave a demonstration of the working, and explained the new Glassoline film, a sort of insoluble gelatine sheet covered with a sensitive coating. It was claimed that they were light, cheap, and non-friable, a great consideration for tourist photographers, and, further, all sorts of cameras had been catered for. Mr. Welford exhibited a number of examples of finished work, also the films in different stages.

Newcastle-on-Tyne and Northern Counties Photographic Association.—February 26.—Mr. Walter S. Corder, J.P., gave a lecture and demonstration, entitled "A Few Notes on Some Early Photographic Portraits." Mr. Corder began with a short résumé of the earliest photographic processes from Niépce's Bitumen through the Daguerrotype, of which several samples were shown, to the calotypes of Fox Talbot, where the first use of photography in an illustrated paper was shown in a salted paper print in an old number of the "Art Journal," which, though much faded, still showed the detail to a fair extent. Lantern slides were then shown of an interesting nature, such as portraits of the fathers of photography, Fox Talbot's first negative, &c. Mr. Corder proceeded to explain the calotype process in detail and passed round a paper negative and print which he had made the day before for this demonstration with an exposure of several minutes. By the kindness of Mr. Andrew Elliott, Mr. Corder was able at this stage to exhibit a set of original calotype negatives by the late D. O. Hill, taken in the year 1843, and salted paper prints from them done in 1848. These pictures are among the marvels of photography, as not only are the prints as good to-day as the day they were done, with the exception of a slight fading around the edges of some, but as artistic portraits they are not to be beaten at the present day. The portraits were mostly those of Scottish celebrities, and comprised Sir John Gladstone (father of the late W. E. Gladstone), Mrs. Jameson, Prof. Lyon Playfair, Christopher North, Sir Francis Grant, R.A., &c. The beautiful rich tone and great brilliancy yet combined with perfect softness, almost excited as much admiration as the masterly posing and lighting which brought out the wonderful character displayed in all of them. The next to be admired were a set of calotype negatives by the late Mr. William Parry (father of Mr. William Parry, of South Shields), illustrating old Newcastle, taken in 1848, these were shown by the kind permission of that veteran photographer, John Werge, and also demonstrated the great brilliancy combined with softness obtainable by this process. The meeting concluded by the development of a calotype negative. A sheet of plate glass being warmed over an electrical heater, had the developer poured over it, and the paper placed face down on to the solution until finished, when it may be fixed in hypo. The chief difficulty Mr. Corder found to be in keeping the back of the paper free from the various solutions, as if it gets soiled at all stains are the result, also in washing after fixing, and when first placed in the hypo they must be dried off roughly with blotting-paper, or the water will not penetrate into the body of the paper.

FORTHCOMING EXHIBITIONS.

1901.		
March 8, 9	.....	Edinburgh Photographic Society. Secretary, J. S M'Culloch, W.S., 10A, George-street, Edinburgh.
,, 8, 9	.....	South London Photographic Society. Hon Secretary, Frank Goddard, Vanbrugh Hill Blackheath, S.E.
,, 19, 20	.....	Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE METRIC SYSTEM.

To the EDITORS.

GENTLEMEN,—There seems to be a good deal of shyness about the means of facilitating the use of the metric system in our dealings; while on the one hand, Mr. Dormer and others find a difficulty in procuring chemicals in convenient metric parcels, dealers whom I have spoken to always say that there is no demand.

Now, the remedy for this state of things does not appear very difficult: let the dealer make known by the usual mode of advertisement that he will supply in packets containing certain numbers of grammes or cubic centimetres his goods, let him show them in this form on his counters, and let him put up such a placard as to attract attention, just as he does with the many things we daily see forced on our notice in shops. When this is done, the shyness of the customer will not long last. I will not ask dealers at once to print their price list for metric packets, or units, because that would entail some expense, but I think they might have them for use in their establishments in MS., so as not to require calculations at the time of making a sale; and in the price lists some of them so freely and obligingly circulate, it would be possible to notify the fact that metric packets can be had by printing the fact conspicuously on some part of the impression.

Evidently, if anything is to be done, some one must take a first step, and it seems to me that dealers and manufacturers are the people who should begin: certainly the class would gain in the end by decimal weights, measures, and coinage.

Trusting that this letter may aid in removing both the diffidence in asking for, and that which prevents the offering of an accommodation which both parties profess to want.—I am, yours, &c.,

J. F. T.

REDUCING CARBON PRINTS.

To the EDITORS.

GENTLEMEN,—I remember that some time ago you gave a method of reducing over-exposed carbon pictures by a chemical means. Will you please tell me what it was, as I have lost the JOURNAL containing it. My chief trouble in the carbon process is either over-exposure or insolubility of the tissue, and possibly that method may help me.—I am, yours, &c., ROBERT FAIRLEY.

[The method referred to, which is very old, was quoted from the "Photo-American," and appeared on page 732 of our issue of Nov. 16, last. It is referred to on another page, which see.—EDS. *B. J. P.*]

THE CROYDON CAMERA CLUB.

To the EDITORS

GENTLEMEN,—Will you kindly mention in your next issue that through pressure of business I have been compelled to resign the position of Hon. Secretary to the Croydon Camera Club.

All communications in future should be addressed to my successor, Mr. E. A. Salt, 76, Heathfield-road, Croydon. Thanking you in anticipation.—I am, yours, &c., W. H. ROGERS.

46, Bensham Manor-road, Thornton Heath.
March 1, 1901.

THE LATE H. P. ROBINSON.

To the EDITORS

GENTLEMEN,—At a meeting of the Council of this Association, held on 28th ult., the President, Dr. Llewelyn Morgan presiding, the following resolution was proposed by Mr. Paul Lange, seconded by Mr. Joseph Appleby, and carried unanimously: "That the Council of this Association learn with deep regret of the death of their esteemed friend and fellow-member, Mr. H. P. Robinson, and suggest that some fitting memorial be raised to perpetuate the memory of one who has done so much in the interest of pictorial photography." I am instructed to add that we shall be pleased to open a subscription list in our own society for this object, and hope that the matter may be taken up by all other photographic societies in the kingdom.

Hoping that you will be able to find space in your next issue for publication of the above.—I am, yours, &c., E. SIMNETT

Liverpool Amateur Photographic Association, March 2, 1901.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Allow me to reply to Mr. Ives's letters in THE BRITISH JOURNAL OF PHOTOGRAPHY, pp. 127 and 141; the more so, that in each of them he makes the charge of loose and inconsistent statements, and says these are what he has been fighting against for thirteen years.

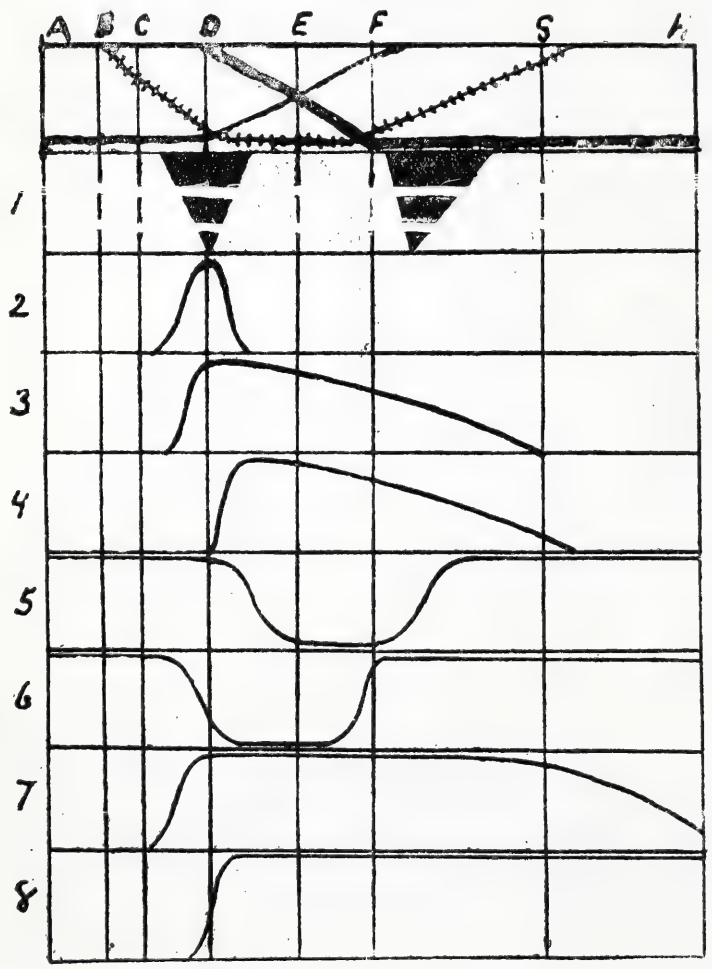
He does so on four different points:—

(1) On the score that my letter of January 25 and article of February 1 contain different statements.

Mr. Ives misunderstands the letter. It was not intended to mean pure colours in the sense of their containing only homogeneous rays. There is nothing in the paragraph to suggest such a meaning. The term used, "bands of colour," was employed in exactly the same sense as used by Professor Maxwell in reference to his projection filters; by Mr. Ives himself in reference to his kromskop glasses; and by Monsieur Du Hauron; and referred to the same bands of colour, as illustrated in Diagram III., in the article which appeared the week following.

(2) Mr. Ives says Du Hauron certainly did not indicate red, green, and violet pure-colour screens.

The thin line A to F represents our red record (top diagram), the line with cross marks our green, and the thick line our violet record. The second diagram (cut through) is the one used in mistake by Mr. Ives.



Surely he is aware that Du Hauron, a year after his first book in 1869 (the one which Mr. Ives so frequently quotes as against Du Hauron), made great advances, and published in 1870, a second volume, "Les Couleurs en Photographie, &c.," published by Marion and Co., of Paris, in January 1870. This book is a complete treatise, with full working details, based upon the use of red-orange, green, and blue-violet filters. The following is a brief extract. On page 13, Du Hauron says: "I obtain from the same subject three negatives through the intermediary of three different glasses; the one green, the other blue-violet, and the other red-orange. I then obtain three monochromes of transparent lakes—a crimson monochrome from the negative obtained with the green glass, a yellow monochrome with the negative obtained with the blue-violet glass, and a blue monochrome from the negative obtained with the red-orange glass," &c.

(3) Mr. Ives says that Maxwell, Du Hauron, Cros, Vogel, Von Hubl, &c., are not in agreement.

As regards Maxwell, if Mr. Ives will refer to his Ogden Rood "Colour," a book he has sometimes mentioned, he will find that Maxwell's pure colours are also red-orange, green, and blue-violet, and the agreement between him and Du Hauron is so exact that, without studying the subject, one might easily imagine Du Hauron to be aware of Maxwell's earlier work, and it surely is unnecessary to add that these gentlemen in referring to these colours, as used when photographing natural objects (as distinct from the spectrum), were not implying that homogeneous, or approximately homogeneous, rays were to be used; the fact that Maxwell gives the composition of his filters, and Du Hauron used glasses, all of which transmit bands of colour, disproves this.

As regards Du Hauron, Cros, Vogel, Von Hubl, &c., perhaps Mr. Ives will refer to page 167 of THE BRITISH JOURNAL OF PHOTOGRAPHY (March 18, 1898), he will there find an article by Von Hubl (one of the greatest living authorities on tricolour work), in which he explains, and draws attention to the fact, that the methods indicated by these gentlemen are all substantially the same.

(4) Mr. Ives says, to be consistent, Farmer should assert that kromskop reproductions must be very bad, because the negatives were not made through pure-colour screens. Yes, certainly I wished to state that, in the case of photographing natural objects, as distinct from the spectrum and other pure colours, Mr. Ives's public teaching, as applied to his own instrument, the kromskop, is wrong, both in principle and practice; but the reason is not altogether the same, as with tricolour printing, and this latter being by far the more important, I prefer to keep to it, as one section, first, as stated in the concluding paragraph of my article of February 1.

I trust these explicit replies are sufficient to absolve me from a charge of troubling Mr. Ives with either loose or inconsistent statements.

The greater part of Mr. Ives's letters are taken up by examples of cases in which, according to him, our methods would give incorrect results.

Surely out of a total of 19 examples Mr. Ives might have given us a solitary one, such as would be required from a trichromatic photographer in practice. Instead of doing this, he first gives a superficially false character to our records by placing his own diagrams upside down as compared with ours; and, notwithstanding that the article (February 1) he is criticising is largely devoted to showing that, contrary to his teaching, the spectrum records suitable for reproducing the spectrum by trichromatic printing are totally unsuited to reproducing the colours of natural objects, he chooses a lot of colours, akin to those of the spectrum in their purity, and at the same time fails to acknowledge that our spectrum records for such colours are fully described and illustrated in our No. 2 diagram. These mistakes of his are, doubtless, accidental. I have therefore written through his incorrect diagram of our procedure, and replaced it by the correct one.

Through his misunderstanding my letter of January 25, he has also put a wrong diagram to the illustrations in his former letter, page 127, and the same correction applies. If any one will go through Mr. Ives's nineteen examples with our colour records, the results, as applied to tricolour printing, will be found to be remarkably accurate, and at the same time free from the fatal degradation of the colours given by the Maxwell curves. He has, in fact, unwittingly given us a magnificent and striking testimonial. If any ordinary subjects—a colour chart, a painting, a vase of differently coloured flowers with leaves, or half a dozen together of the same dyes, quoted by Mr. Ives, but in the form of dyed ribbons or other fabrics, are photographed, and with the printing inks of his own specification, tricolour prints are made, the best results, both as regards fine differentiation of hue and luminosity values, will be obtained with plates and filters giving the spectrum records, substantially as indicated by us, and confirming Du Hauron and other workers in the correctness of their views and against Ives. What does Mr. Ives offer us? I quote his letter referring to his dyes, which is characteristic:—"All these colours would be very perfectly differentiated by Maxwell curve analysis, and the record would be one of luminosity values, as well as hues." What a beautifully complete statement so far as it goes. But what is the use of a record which demands for the reproduction it gives the use of three narrow bands of red, green, and blue light? The practical results, if Mr. Ives's instructions are followed, will be degraded into colour—dirty-looking and reddy all over.

Of course all these arguments, either Mr. Ives's or our own, are of no use unless confirmed by actual practical results.

So far as Mr. Ives is concerned, we have two statements on this point, the first as regards himself. On page 47, he says, "I obtained remarkably accurate and brilliant results when making tricolour prints from Maxwell curve negatives." The second, as regards practical three-colour operators, he says (page 127), "What the practical three-colour operators think is of no consequence in view of the results which they are now obtaining up to the point of commencing their faking

operations. Of course, faking has to be resorted to in many cases, just as in the case of ordinary photography, and I can readily believe it is necessary in every subject when Maxwell curve records are employed." Presumably, therefore, he is referring to operators who are using these filters, at his instigation; so that, as far as we know, Mr. Ives is the only person who can work his own process.

Further, I believe the record of every independent worker who has wasted time, money, and patience in trying to use the "Ives principle" in tricolour printing is a record of failure.

As regards ourselves, during a period of three years that Mr. Ives's teaching was followed at this school not a single successful result was obtained. After a fresh start, discarding the Ives principle and adopting Du Hauron's, a collection of work (unfaked) was sent to the Paris Exhibition, and if the Editors are willing to defray the cost of printing, our Mr. Guy Symmons, or plenty of our students, will publish in THE BRITISH JOURNAL OF PHOTOGRAPHY one or twenty specimens of absolutely unretouched and unfaked work, and there are doubtless many other workers who would do the same.

It is now sufficiently apparent that whatever colour records are correct, Mr. Ives has already said so before, or leaves himself open to claim as his own, for it appears that, not satisfied with giving four variations in the filters which he uses or supplies, the procedure we recommend (Du Hauron's) is the one he (Mr. Ives) has also recommended for poster and label effects (page 142). It would seem reasonable to suppose that the originals from which posters and labels are made would be painted by the artist in their proper brilliancy, and the work of the photographer would be satisfactory if he correctly reproduced them; and if the Maxwell colour records will do this, why forsake them?

In conclusion, Mr. Ives has not attempted to answer our request by giving any logical grounds in which he can support his claim to having enunciated, in the Maxwell curve records, the correct procedure for tricolour printing, although on our side we have, at his request, given the colour records we employ, together with the reason for the failure of the Maxwell curve records; the results of which must also be viewed in a mixture of pure red, green, and blue light, a proceeding ridiculous in practice, and also quite unnecessary, if, instead of vainly endeavouring to support a principle which depends for its very existence on this condition, we throw it overboard, and adopt for our practice the methods evolved by the genius of Monsieur Louis Ducos du Hauron. HOWARD FARMER.

Polytechnic, 309, Regent-street, W.

BONA FIDE DEALING.

To the EDITORS.

GENTLEMEN,—With reference to my letter on the above subject, published in a recent issue, perhaps I did not make it quite clear that the proprietors of the establishment from which I stated I had "repeatedly purchased plates—manufactured by the firm of which, I believe I am correct in saying, the principal is also the presiding genius of the Plate-makers' Association"—also run a photographic studio. It would be interesting to know whether they are on the Plate-makers' Association's list of dealers. I should infer that they are; at any rate, I should imagine that they are in a position to secure dealers' terms.

Presumably, any professional photographer can sell photographic goods if he is so minded; and what is to prevent anybody—assuming, of course, that the necessary capital is available—from opening a photographic studio in one town, and running the business in his own name, and at the same time opening a photographic goods depôt in another town, and running the establishment under a trade name? If he cannot do this in order to secure dealers' terms from those firms constituting the Plate-makers' Association, there are other ways of evading their restrictions if a dealer, who is also a photographer, wishes to do so.

With respect to the letter published in your issue dated February 1 on this subject, I find it is not quite correct to say that the authors "run a studio and a photographic stores." The studio in question is not a studio in the ordinary professional photographer's sense; but it is used, so I am informed, purely for lecturing and demonstration purposes. The proprietors write: "We do not 'run a studio' as professionals; but it is purely an instructional studio in which we lecture, and teach those wishing to learn the higher branches of the art of photography. And herein lies the sweet inconsistency of the 'ring.' We were on their list of dealers for three and a half years when we actually were professionals, and the Association were well aware of the fact the whole time! Yet, when we abandoned professional photography altogether in favour of our present style of business, then they put us off the second time!" What this apparent inconsistency on the part of the Association means, goodness only knows! The whole thing is a puzzle. It is easy enough to see, however, that the Plate-makers' Association have no easy problem in their efforts to regulate prices, more especially when some of the leading manufacturers do not consider it to their advantage to be members of the said Association. The manufacturers will doubtless see to it that the middleman, i.e., the dealer, does not receive an undue proportion of the profits; but until the manufacturer can do without the middleman, he will have to treat him with respect.

Some students of economics may wonder why it is necessary to have distinct terms for the professional and the dealer respectively, and whether it would not be more advantageous all round to have two prices only, one for the private consumer, i.e., the amateur, and another for the professional or dealer, the terms for the latter being a mean—or thereabouts—between the Plate-makers' Association's terms to the dealer and their terms to the professional. If the manufacturers fix uniform prices to dealers and professionals, the former would, in many instances, be materially affected, the reason being that the local dealer frequently supplies the local professionals with their material. This, of course, refers more particularly to the bonâ fide dealer, for local professional photographers would hardly make a general practice of getting their goods from the local dealer who is also a photographer.—I am, yours, &c., J. A. REID.

Cutcliffe-grove, Bedford, February 25, 1901.

SOAP BUBBLES AND COPYRIGHT IN PORTRAIT PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—It is no laughing matter; still I cannot help smiling at the slips you have made in the last half of the first paragraph in your issue of March 1. No doubt soap is a slippery substance to tread on, and you had evidently not recovered your equilibrium when you thought that photographers giving away soap and cigarettes with their photographs was parallel with soap manufacturers copying photographs and underselling photographers.

Or does our Editor mean that photographers should also become soap-makers, and give tablets away with their photographs at a cheaper rate than Ogden, Lever, and Co.?

Doubtless there is something in the idea, which reminds one of the saying, "Taking a hair of the dog that bit you," But where does the adoption of the idea lead to? Simply this: that photographers would require to add to their businesses not only soap and tobacco-making, but likewise newspaper and magazine printing and publishing.

It seems to be overlooked that the photographer is in a peculiar and unique position, which is not parallel with that of any other business. Look how he has to strive to attain excellence in his many-sided calling? The waste of time and material are of no account; he is chiefly concerned in the mind of the sitter with pleasant thought that graceful and unrestrained form may come and gladden his heart in securing it; yet, soon hereafter the copyist may come in and rob him of his just reward.

The photographer's work is akin to, and can only be classed with, that of the artist, whose productions are justly protected by copyright law. Then why should the photographer, a humbler brother though he be in the production of pictures, not also have copyright in his work?

No doubt such a claim might possibly require to be draughted in a restricted form. Still, some protection should be asked for against the mean and callous copyists abounding, and likely to multiply.—I am, yours, &c., JOHN PATRICK.

52, Comiston-road, Edinburgh.

NOT MESSRS. OGDEN THIS TIME.

To the EDITORS.

GENTLEMEN,—I herewith enclose a circular which has just come to hand, and which goes to prove that the state of the photographic profession is not entirely due to outside competition (Ogden's, &c.)—I am, yours, &c., HENRY T. LEACH.

3, The Turl, High-street, Oxford, March 2, 1901.

[We append the circular sent in its entirety. EDS. *B.J.P.*]

"We Lead. Others Copy Us. Boating and College Groups, 12×10 Plates, One Shilling Each.

"Sir,—We make you the special offer to photograph your group the usual 12×10 size plate, and supply copies at 1s. each, on condition that each gentleman in the group takes a copy and that cash be paid.—Henry W. Taunt and Co., 34, High-street, Oxford. Works: Rivera, Cowley Marsh. The usual price charged you by other Photographers for the same thing is 3s. 6d. and upwards. A Fine New Series of this Year's Boat Races."

THE OGDEN-LEVER CHEAP PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—Allow me through the medium of your paper to thank Mr. Rudston for his letter re the organization of professional photographers. I quite agree with him that it is time we did something to protect ourselves before it is too late. Every profession, business, and trade has now its own association, but we poor photographers are still out in the cold, and what is the consequence? The plate-makers dictate to us their own terms. The paper-makers seeing how easy it is do ditto, and now the mount manufacturers come and demand ten per cent. more for their goods, and yet we take no notice. I am afraid we photographers are making a big mistake by this submission to everybody.

Then we have this business referred to by Mr. Rudston (I mean the cigarette touch). Well, we can do a little with that, and, as far as I am concerned, I shall take care I do not buy any more of this firm's goods, neither shall I accept any from my friends; but, on the contrary, shall boldly repel all goods bearing the name of this firm.

May I suggest that you, Mr. Editor, receive the name of any photographer willing to join, and also arrange a meeting if possible. Of course, the old bogey will be trotted out about the last association, but it is as Mr. Rudston says, an age of combinations and ought to be done. Surely we have now enough new blood in the profession to do something. I should go further than Mr. Rudston goes and say let us have a co-operative society, and see what the plate-makers would say if we become our own merchants and dealers.

I do hope that a start will be made, for I am sure we have everything to gain and very little to lose. Trusting to hear more of this. —I am, yours, &c., F. KENWORTHY.

February 27, 1901.

To the EDITORS.

GENTLEMEN,—I confess to being disappointed at the line you have adopted in THE BRITISH JOURNAL OF PHOTOGRAPHY with regard to what I cannot help considering as a serious menace to the higher interests of photography. I refer, of course, to the invasion into the domain of photographic business for purposes of advertisement by such notorious firms as Messrs. Ogden and Co., and Messrs. Lever Brothers. This is a free country as you say, and I am certainly no supporter of sentimentalism in matters of business, but this cry of "freedom" in all questions of trade is apt, through incessant repetition, to become a parrot cry, and the liberty so constantly and so loudly claimed is apt to degenerate into license. With the vexed question of the protection of home industries from the competition of the foreigner, I have, in this case, fortunately, nothing to do. It is merely a question either of one great home industry seeking to protect itself by every means in its power against what it honestly believes to be an outrageous trespass upon its preserves by another, or of the Government of this country being urged to bring order out of chaos and to lay down clearly defined rules as to where such trespass may fairly be said to occur. This latter proposal is made by a correspondent in your issue of the 22nd, and I think there is a great deal to be said in favour of such an amendment of the Copyright Act as he proposes. But I am also strongly of opinion that photographers can do much to protect themselves by proper organization and by boycotting if need be such purveyors of soap or cigarettes as choose to encroach upon their domain, or, what would probably be more effective, by boycotting all manufacturers of photographic materials who supply the said purveyors with the means of carrying out their project.

But I wish it to be clearly understood, Sir, that I am not writing this from a sense of the sharp practice of the enterprise, nor from any fear that such photographs as may be supplied by Messrs. Ogden and Messrs. Lever Brothers, will seriously compete with the work turned out by the leading firms in the richest and most critical city in the world. That the smaller photographers in both town and country may and will suffer very seriously from such competition, I have no doubt, for have we not had object-lessons in the widespread ruin caused among the smaller booksellers by similar competition among cheap drapers and general stores, or, as in the United States, by the vendors of every kind of patent article who seek to elevate the taste of their customers by throwing in a standard novel with a pound of soap. This is not the aspect of the question to which I wish to call your attention. From the advertisements which I enclose, drawn as they are from the "Daily Mail," from "Punch," and from "Black and White," it is manifest that the appeal of Messrs. Ogden and Messrs. Lever is to every class in the community, and people of every sort and condition will have their attention drawn to this unnatural union between photography and soap, or photography and cigarettes, whichever advertisement the eye may happen to light upon. They will see there that twelve "real permanent cabinet photographs" can be had for 2s. 6d., and that they can be turned out by soap-boilers and by cigarette vendors, without any special training in photographic business, and apparently without the need of any special plant. The trifling fact that these same "real permanent cabinet photographs" are copies of another man's work, this work the result of long and expensive training and individual ability, and that they are, therefore, deliberately filched from another man's hand and brain, will, of course, be overlooked, and the net result will be a general lowering of the public estimation in which professional photography is held. Nor is this all. Of late years many men and women of education and trained artistic sense have adopted photography as a profession, and have rejoiced in trying to infuse into what must always be one of the most human of pursuits, an artistic quality and a sense of beauty which have not, perhaps, always been conspicuous in professional portraiture. These efforts have met with undoubted success, and a ready response on the part of the educated public, quick, as always, to appreciate sincere endeavour in any direction. Under these circumstances no photographer who has the best interests of his profession at heart, can fail to be disgusted and disheartened by its association with the spread of cheap cigarette-smoking, one of the curses of modern England, or even with the exaltation of a particular brand of soap, the endless variety and persistent advertising of which commodity may well cause our neighbours across the Channel to exclaim that we must surely stand in greater need of cleansing than all the other peoples of the earth.

I must ask your pardon, Sir, for taking up so much of your space. But it has seemed to me that if ever the time had come when it was incumbent upon the photographer who is trying to take his work seriously, to protest against its wanton degradation from outside, that time has come now, and for that reason I sincerely hope you may be able to find room for my remarks.—I am, yours, &c.,

1, Park Side, Hyde Park Corner, S.W. ETHEL M. ARNOLD.

February 26, 1901.

COUPON PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—We have read with interest the correspondence in your columns with reference to the latest method of coupon photography as carried on by Messrs. Ogden and Messrs. Lever Bros.; and, while naturally our entire sympathy is with our brother photographers, we cannot shut our eyes to the fact that until the law makes it illegal for amalgamated capital to unnecessarily injure small traders, they are both within their rights in what they are doing, though, from a moral point of view, there is a great deal to be said against such methods. But, then, is trading always done in such a strictly moral law that one man's success shall not injure any of his fellow creatures? We trow not. This being so, let photographers recognise that they have to contend to-day with poachers into their domains as well as ordinary competition, and set themselves to meet such by greater union amongst themselves and greater attention, both to the technical and business portions of their business, and especially to the latter, and then it will take more than Messrs. Ogden and Lever combined to materially affect the photographer who looks after his business. Our main point in writing, however, was to point out, as the above will prove, that we do not cavil at fair competition, however keen, but like fairplay. Now in both the above-mentioned firms' advertisements they state "permanent photographs" will be sent. Is this the case? As, if so, they would have to be platinotypes or carbons; and, if bromides we contend that this is a misrepresentation that no photographer with any respect for his reputation can afford to make even if he desired to, as no one will contend that bromides, however carefully produced, are permanent, and we emphatically protest, on behalf of the photographic profession, against this part of their system. We have not actually verified what the prints sent out are, but have heard they are bromides or collotypes, and, even if the latter, they cannot correctly be termed "permanent photographs." In the main we agree with the view you take of the matter, but think this point must have escaped your notice when commending the two firms named for not resorting to unfair methods of obtaining the business. Apologising for troubling you, but we feel this is a matter that concerns every photographer. We have written to both the firms mentioned, stating our view of the matter and enclose you a copy of the letter sent.—We are, yours, &c.

NEWTON AND CO.

19 to 21, Fife-road, Kingston, S.W., March 4, 1901.

(COPY.)

"Messrs. Ogden's, Ltd.

"Dear Sirs,—With reference to the correspondence in the photographic press relating to your advertised coupon system of distributing photographs, while for our part we do not intend to raise any protest against such a system, if you consider it necessary to maintain it to keep your business together, though we should have thought that the goods made by a firm of such repute and standing were sufficient to do this, but we do most decidedly object and enter our protest against your describing these productions as "permanent photographs," unless they are either platinotypes or carbon prints, and we have good reason for believing them to be neither of these, we do not hesitate to say that such a description is a decided misrepresentation, and not

fact, and that no photographer of repute would dare to sell them as-such, and you will, we are sure, admit that for you to do so is not even fair competition, to say the least of it. As this is a matter that very nearly concerns the whole photographic profession, we feel confident you will give this point your early consideration, and if you needs must deal in photographs, at all events let it be on fair and square lines, as it will be obvious to you that if to produce really permanent photographs costs you twice as much as what you now sell, even you cannot do as you advertise to do.—Yours faithfully, NEWTON AND CO."

To the EDITORS.

GENTLEMEN,—Would you kindly insert the enclosed in next week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, and help us all you can with this important matter.—I am, yours, &c.,

JOHN S. GREENACRE.

101a Rosemount-place, Aberdeen, March 3, 1901.

At a meeting of the professional photographers, held in the Palace Hotel, Aberdeen, on February 28, Mr. James Ewing in the chair, resolutions were unanimously passed that steps should be immediately taken to protect the interests and rights of professional photographers throughout the United Kingdom, which, by the action of certain soap, tobacco, and other firms are being infringed upon. A committee of seven was appointed to carry out the proposals made at the meeting. which were (1) That the whole of the profession should combine to bring pressure to bear on their various members of Parliament, and also the promoters of the future Copyright Act, to introduce a clause protecting their right in the results of their own production; (2) that requisitions, signed by every professional photographer in the United Kingdom, should be prepared and forwarded without delay for the use of the Copyright Union or its legal advisers; (3) that all photographers should, in place of charging for proof, make a minimum charge of half-dozen. The Committee note with pleasure that a start has been made in this week's BRITISH JOURNAL OF PHOTOGRAPHY, and think it is the duty of the Copyright Union to move in the matter. The Committee will also be pleased to receive any suggestions from other photographers throughout the country, which would be brought up at the next meeting March 21. The following photographers were appointed by the meeting to act on the Committee:—Mr. James Ewing, (Chairman), Mr. Morgan, Mr. Anderson, Mr. McMahon, Mr. Dunn, Mr. Middleton, and Mr. Hardie. All communications to be addressed to the Hon. Secretary, John S. Greenacre, Rosemount Studio, Aberdeen.

To the EDITORS.

GENTLEMEN,—As one of the many affected by the action of the soap and tobacco makers, I wish to tender my thanks to Messrs. Newman, Mayall, and Co., for their action in approaching Ogden's, Ltd., as they have done, and this is no doubt the feeling of thousands of brother photographers.

Now, gentlemen, what is to be done? What would be the action of our artists, whether in colour or black and white, if they were threatened by such wholesale copying as that which now threatens the photographer? They would leave no stone unturned until they had secured for themselves and their works such protection as would make it impossible for such an injustice to ever rise again. And this is what photographers should do. As Mr. Rudston says, "Organize," and, though we may be cutting one another's throats (vide "Othello"), let's try and stop outsiders from doing the same thing.

Let us be busy in another direction. If it has pleased the King to mention in his Speech the Amendment of Copyright, here is a state of things that wants it sure enough. Let a petition, signed by every photographer in the Kingdom, be presented to the proper quarter by some influential body (the R. P. S. or the Copyright Union, for instance), praying for reconsideration and amendment of the laws of copyright, or a clause to be inserted, affording protection against such attacks on our livelihood.

Surely the voices of the tens of thousands of photographers raised as one accord would have some weight, and show we have some sense of the injury that is being done us. Let a subscription be opened to defray any expense it may entail, and make one great effort to stamp out such schemes as this which are sapping away our work at present, and which will, no doubt, be more extensively used in the future. Indeed, I think there is no limit to which this system may be carried, especially with such pleasant baits as photographs. "Othello" says we must grin and bear it, solacing ourselves that some one must take the photograph before it can be reproduced. True; but I for one, am not content to take that photograph, and Messrs. Smoke and Bubbles complete the order. Now, photographers, "Organize."—I am, yours, &c.,

A WEST OF ENGLAND PROFESSIONAL.

March 4, 1901.

RE COUPONS AND CASH FOR PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—Why should photographers sit down to grin and bear it, as suggested by "Othello?" Why not be up and doing? Carry the war, so to speak, into the enemy's country. I venture to predict that any enterprising man or firm going in for it would make a little fortune if well advertised by handbills after the manner of the enclosed.

Go it, some of you, and if you find you want an operator who can take about one hundred sitters per day, and still smile, I am your man. —I am, yours, &c., AN ALL ALIVE OLD 'UN.

[The following flight of literary composition embodies our correspondent's ideas of a suitable handbill. EDS. *B.J.P.*]

COMMERCIAL WAR. RIGHT AGAINST MIGHT.

In consequence of soap-boilers and tobacco manufacturers encroaching upon our legitimate business, we, the undersigned, have decided to make our patrons presents of the following useful articles, viz., to each sitter for one dozen of our beautiful enamelled midgets, price 1s., we will give a 1lb. bar of the celebrated Rainbow Soap, the wrapper of which entitles bearer to a further present from the Rainbow Co., or, if preferred, a choice packet of cigarettes manufactured by .....; to each sitter for half a dozen of our artistic and highly-finished cabinets, price —, we will present 1lb. of the M. U. Co.'s tea, the wrapper of which entitles holder to a further present from the M. U. Co., or, when preferred, ¼lb. of choice cigarettes. We will also give presents, pro ratio, of silver-gilt lockets, brooches, or other jewellery; also neatly bound volumes of the most popular novels of the day. Come, and bring your sisters, your cousins, and your aunts, not forgetting the children. Come often and regular, and choose your own present. Don't be put off with copies when you can have originals properly finished cheaper. Note address.

"GUINEA GOLD PHOTOGRAPHY."

To the EDITORS.

GENTLEMEN,—I read your article on February 15, but did not understand from it that you were in sympathy with the scheme, but simply admitted Messrs. Ogden were within their *legal* right; whether any class will suffer thereby does not appear to have much consideration. There are many things done that cannot be touched by the law, but nevertheless are intensely selfish, and, in that sense, wrong; some time ago I heard of a man who had been in partnership with another, but who relinquished his share in order to receive, instead, a permanent fixed salary, and on the understanding that he would not work, directly or indirectly, in the same town at any future date to the detriment of the business in which he was *formerly* partner; he was trusted to act honourably, but, instead of doing so, taking advantage of the fact that he was not legally bound by deed, he did, after a short space of time, open a shop in the same town and in the same way of business. That man acts within his legal right, but none the less he acts dishonourably and in a selfish manner.

During last year one of the City stipendiaries had a man brought before him for appropriating some goods that belonged to another; his curious defence was that he knew if he did not take them some one else would, to which the Judge replied, You might, with equal reason, say that you are justified in committing a murder because you knew if you did not some one else would. I forget for the moment the actual sentence he received. If Messrs. Ogden want to consider the photographic profession and *not themselves only*, let *them* do the right thing, no matter what others may do.

But referring once again to February 15 I quote, "You will receive one dozen real permanent photographs, &c., &c." Now, it is known and admitted that bromide prints are not "permanent photographs," and therefore if such be supplied it is little less than obtaining money by false pretences. If they supply carbon prints, or platinotypes, or photogravures, or prints from half-tone blocks, then it is another matter; but few, I presume, need to be told neither of these processes could be utilised at the price. There are few trades more handicapped than photography by the competition of very large firms, and the Plate and Paper Association, which has driven a large proportion of it into the hands of chemists.—I am, yours, &c., CLIMAX.

[We are obliged to hold over several other letters on this subject. It will be seen by the above correspondence that five methods are suggested for enabling the photographic profession to grapple with such unfair forms of competition as those adopted by Messrs. Ogden and Messrs. Lever. 1. AMENDMENT OF THE COPYRIGHT ACT.—In all probability this session will witness the introduction of a bill affecting copyright and this should give the Photographic Copyright Union the suggested opportunity of endeavouring to secure the

insertion of a clause protecting photographers' work from reproduction by anybody but photographers themselves. From what we can gather this appears to be the idea in the minds of some of our friends, but we hope Miss Arnold and her fellow correspondents will forgive us the expression of the opinion—founded upon a long and intimate knowledge of copyright matters—that a workable clause of this nature is neither practicable nor probable. The present Copyright Act, with which, unfortunately, few photographers are conversant, gives full protection without, it is true, contemplating such cases as those under discussion. The officials of the Photographic Copyright Union will probably bear us out in saying that the likelihood of a photographer being legislatively given the power of interdicting a sitter from having a photograph (paid for by the sitter) reproduced by anybody else but the original photographer, is too remote for serious consideration. Frankly, we have no hope whatever that copyright legislation is to be looked to as a protection against such invaders as Messrs. Ogden and Messrs. Lever, and we advise the abandonment of the idea. 2. THE ROYAL PHOTOGRAPHIC SOCIETY.—This Society exists for "the advancement of photography," and does not concern itself with trade or professional questions. In emergencies of the Ogden-Lever kind it has no power to act. 3. THE PHOTOGRAPHIC COPYRIGHT UNION.—This Union confines itself exclusively to the defence of photographic copyright; and we can perceive no way by which it is either able or willing to assist photographers in resisting unfair competition. 4. THE FORMATION OF A PHOTOGRAPHERS' PROTECTION ASSOCIATION.—This idea has been suggested many times, and carried out once. The National Association of Professional Photographers, whose aims were mainly defensive, was not well supported and succumbed to indifference. The present emergency, however, has provoked numerous powerful pleas for the formation of a representative organization of professional photographers charged to guard their many interests. A well-administered, centrally governed body of this kind, supported by the whole of the profession in Great Britain and Ireland, would be a tremendous instrument for action in crises such as that of the present moment, and others imminent or to be conjectured. We shall be glad to have further expressions of opinion on this point. If we can plainly discern amongst the 5000 professional photographers of these islands a strong and sincere demand for such an organization, we are prepared to take steps to facilitate its formation. 5. LOCAL ASSOCIATIONS.—It will be observed that our Aberdeen friends have formed a local Association, to which we wish success. Associations of this kind are great powers for good. At Bolton some years ago the professional photographers united, and were instrumental in checking an abuse of the cheap enlargement system. In the larger towns professional photographers are easily called together; and there is no reason why at such important centres as Brighton, Glasgow, Edinburgh, Liverpool, Newcastle-on-Tyne, Manchester, Birmingham, Leeds and other places, permanent associations of professional photographers should not exist for the purposes of mutual interest and protection. To sum up: a great combination of professional photographers of England, Ireland, and Scotland, seems to us to be imperatively called for, and we invite the views of our readers on the subject. If within the next ten days a sufficiently large number of letters favourable to the idea be addressed to us we shall be happy to assist the movement by every means in our power. There is a very wide field open for a Professional Association, and in the preliminary work of organization and construction our journalistic and personal services are freely placed at the disposal of those amongst whom it is our privilege to labour on the pleasantest terms of sympathy and friendship.—EDS. *B.J.P.*]

THE BENNETT TRIAL.

To the EDITORS.

GENTLEMEN,—No doubt every one interested in photography will have read the expert evidence produced at this trial, and will have probably agreed that under no circumstances can a link chain be photographed so as to resemble a rope chain in the finished photograph.

This morning happening to look through some old prints I came across the one enclosed, in which the chain, a link one, appears distinct as a link chain on one side, and has all the appearance of a rope chain on the other through being out of focus. It will also be noticed that as the chain (on the side in focus) gets out of focus on the shoulder an appearance of a rope chain is produced. It would appear, therefore, that it is possible to give a link chain the appearance of a rope chain.—I am, yours, &c.,

March 4, 1901. RUSTICUS.

[The portrait enclosed by our correspondent is that of a lady, and he very accurately describes the varying appearances of the chain, which is worn round the neck and thence down to the waist.—EDS. *B. J. P.*]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED:—

J. Stuart, Claverton, Helensburgh.—*Photograph of the late J. W. Burns, Esq.*

TONING P.O.P.—H. SMITH. Your query was answered last week.

GEO. W. BRADSHAW.—See latter part of reply to "Studio;" we know o no book specially devoted to Rembrandt lighting.

WEEKLY READER.—1. The term is meaningless: and, therefore it woul apply equally as well to a fortnight as to twelve months. 2 You have no claim. In future obtain an agreement, and have i clearly expressed on the point.

BOOK ON COLLOTYPE.—X. Z. writes: "Would you be kind enough to giv me the name of a work on collotype process, also publishers?"—I reply: "Photo-mechanical Printing Processes," published by Messrs Marion and Co., Soho-square, W.C.

DISTORTION.—T. BOYDE. The leaning perpendiculars are due to th camera being tilted upwards when the building was photographed It is no fault whatever of the lens. Any lens would have yielded similar result if used under the same conditions.

BLOCKS FOR PHOTO-ETCHING.—"PHOTOPHIL" writes: "Very probabl your inquirer F. D. (p. 128), could get what he wants from Bri dault, rue de la Huchette, 27, Paris, or from G. Peignot et fils, 6 Bd. Edgar Quinet (or perhaps Mallet, 152, r. Montparnasse)."

BURNISHER FOR P.O.P.—T. F. writes: "Should be pleased if you coul recommend me the best burnisher for P.O.P."—In reply: Any o the burnishers sold at all the photographic warehouses are goo for the purpose. It is quite against our rule to recommend an particular manufacturer's goods.

BOOK ON LENSES.—"LENSES" writes: "Please give me the name of a goo book on lenses, one explaining all the terms, not a big one, somethin small and to the point."—In reply: "The Optics of Photography an Photographic Lenses," by the late J. Traill Taylor, publishe by Whittaker and Co., Paternoster-square, E.C.

DAGUERREOTYPE PLATES.—"EXPERIMENTALIST." We fancy you will ha a difficulty in obtaining Daguerreotype plates, as probably no have been made during the last forty years. The only thing w can suggest is to advertise for them; some one may possibly ha some left in stock, though we are inclined to doubt it.

ANIMATED PHOTOGRAPHY.—F. H. writes: "I have a photograph of the Roy Funeral Train (a snap-shot); can it be made for or into an animat photograph for projection, if so, can you suggest a firm where can have it made?"—In reply: The idea is impracticable. One p tograph cannot be made to answer the purpose of many in the w suggested.

E. P. NICHOLSON.—1. and 2. No. Not that we are aware of. Mess Marion and Co., sell a solution for sensitising the ordinary car Messrs. Griffin sell thick paper or cards ready sensitised, b not, we think, printed with the postal information. 3. The car may be salted, sensitised, and printed as ordinary paper is, if t cards are of good quality.

PATENTS IN LIGHT FILTERS.—"KNOX" writes: "Would you kindly info me whether the manufacture of light filters for the three-colo process is a patent, as I wish to put some on the market."— reply: The manufacture of light filters is not exclusively protect by patent. There is considerable scope for the exercise of o ginality by our correspondent.

DISH FOR DEVELOPING.—W. HARDCASTLE writes: "Would it be safe use a dish for developing, made of wood and painted with Aspi enamel, or shellac varnish, or can you tell me of any other varn suitable?"—In reply: Wooden vessels coated with either these materials will answer quite well, but see that the wood perfectly coated with the protective.

SHELLAC VARNISH.—G. GODDARD writes: "I have always understood t shellac is soluble in methylated spirit, but I find it is not, for other day I bought some white lac and, although I crushed it it will not dissolve in the spirit. After it has been soaking nea a week it shows no signs of dissolving?"—In reply: Shellac soluble in spirit. But, doubtless, that which you have got been bleached a long time, and has become "perished." If t is the case it will not dissolve—white lac should be used fresh.

GUM.—W. T. writes: "Will you kindly say how I can procure gum exactly like that which is used on postage stamps, or give me the receipt how to make it?"—In reply: The adhesive used on postage stamps is dextrine, which may be purchased at most oil shops. It is possible, however, that it may in some way be slightly modified, as used for official stamps. However, dextrine alone will answer the same end.

DOUBTFUL LENS.—"NOVICE" writes: "I have a cabinet portrait lens offered me for three pounds, which is said to be by Dallmeyer, but there is no name or number on it. Can you please say how I can tell whether it is by that maker or not?"—In reply: Send it to Dallmeyer's and they will tell you. As the lens bears neither name or number, we have little hesitation in saying that it was not made by Dallmeyer.

ENGLISH DRY PLATES IN PRETORIA.—"SOUTH AFRICA" asks: "Can you inform me if English plates are kept in stock at Pretoria? I have to go there next month and shall take a camera with me."—In reply: We cannot say, but even if they are procurable there, we should advise you to take a supply with you, as then you will ensure having them fresh. If they are to be had there, it is possible that they may have been in stock some time.

CARBON PRINTING.—A. GOODSON says: "In developing carbon prints, single transfer, I often find that the lights and light tones wash away, leaving the picture deficient in half-tone. Can you inform me the cause?"—In reply: There are different causes for this use of too hot water for the development. Another, that the tissue is in too soluble condition, the remedy for that is to keep it longer before it is used. Too weak a sensitising bath also may be the cause.

READY SENSITISED CARBON TISSUE.—C. WARNER says: "I see it often recommended that amateurs should buy their tissue ready sensitised. I have applied to several photographic dealers and they all tell me they do not keep it. Can you please tell me where it is to be had?"—In reply: Sensitised tissue is not stocked by dealers, as it will not keep long. You will have to get it direct from the makers. Both the Autotype Company and Messrs. Elliott and Son supply it. They supply it in small quantities.

A PATENT QUESTION.—F. S. LETTY writes: "I have made a changing-box on what I believe to be an entirely new and much simpler principle than any of those at present on the market. The whole action, together with twelve quarter-plates, is contained in a box 5 by 4½ by 2½ ins.; the indicator cannot indicate that a plate is changed unless it is really so; there are no changing bag or dark slide attachments. I cannot afford to patent it unless I am assured of its commercial value, therefore I shall be greatly obliged if you will allow me to submit it for your inspection, and favour me with your opinion of the same."—In reply: We shall be very pleased to inspect the changing-box, if our correspondent will send it for that purpose.

COPYRIGHT.—"SIAMESE TWINS" writes: "A week or so back when you were mentioning Messrs. Ogden's scheme in your columns, you stated that you did not consider that all the questions they put insured them from copyright infringements. As we are much interested in copyright matters, we should be much obliged if you would inform us in what other way they should be on their guard against an action for infringement."—In reply: In our opinion B. and D. of the declarations quoted would be insufficient to form a defence in case of an action for infringement. Written assignments of copyright would be necessary. Apparently verbal consent is relied on. Clause 3 of the Act stipulates that the assignment must be in writing.

BOOKS ON PHOTOGRAPHY.—"RUBY LIGHT" writes: "I was apprenticed to the photograph business, but left it for some twelve years. I now wish to return to it, and am about to do so, by purchasing a studio in London. Naturally I have somewhat dropped behind in my knowledge of things photographic during the years I have been employed elsewhere. Can you, therefore, tell me what is the very best modern, and up-to-date, and detailed work on the subject of photography, giving all the latest improvements, hints, &c., on new processes, and those at present most in vogue in the trade?"—In reply: If our correspondent will obtain copies of our ALMANAC for the past five or six years, and devote a little time to the study of the advertisements as well as the text, he will have gone far towards putting himself en rapport with most recent photographic developments. Let him write again if the advice does not seem to meet his case.

BLOCKING OUT NEGATIVES—FORMALIN.—W. THOMPSON writes: "Would you kindly gave me a recipe for making a blocking-out liquid for negatives; at present I am using carbon Indian ink, but, using so much as I do, I find this very expensive; also, which do you recommend as being the best way to use formalin as a hardening agent for negatives, putting it in the fixing bath, or soaking the plate in a solution before developing, and what would be the strength to use in either case?"—In reply: Try a photographic black varnish, such as Bates' black varnish. It is cheap and good. There are other black varnishes that are good for the purpose. Photopake, supplied by the Vanguard Co., is excellent for such work. We do not find a hardening medium necessary with the present makes of dry plates except, perhaps, in very hot weather. We prefer to use it, when necessary, after developing. About five per cent. of the ordinary solution, as purchased.

ENLARGING.—"MANAGER" asks: "(1) Could you tell me if I could enlarge by artificial light, and what would be the best light to use? (2) What candle power electric light would be required, if I could enlarge by that?"—In reply: (1) Certainly; all photographic dealers supply apparatus for the purpose. See their catalogues, and advertisements in the JOURNAL and ALMANAC. (2) The candle power is quite immaterial. The higher it is, of course, the shorter will be the exposure, and the lower the longer.

LOCAL REDUCTION.—H. DOWDEN writes: "In taking the enclosed snow view the other day, I omitted to look at an old front I used in my hurry, with the result that light came through two small screw holes and spoilt a picture, which otherwise I certainly should have valued. I have not touched the negative yet, as I prefer asking your kind advice upon the matter first, as to the best means of treating this patch of density. Local reduction with cyanide, or rubbing down with methylated are the only two methods that occur to me."—In reply: You may try these methods, or any of the other methods of reduction, but we very much question if you will remove, or reduce, what you term the patch of density. The light that has reached the plate through the screw holes has quite overpowered that reaching it through the lens. If you succeed in removing that, we expect you will have no trace of what should have been the image.

COPYRIGHT.—"STUDIO" writes: "(1) A photographer takes photographs of a prominent American politician at his house in England, and sends these photographs to a New York paper (having been paid by the above-mentioned gentleman for taking them in the first place). Is he liable to be sued for damages for infringement of copyright, if the copyright of photographs in question has not been registered by either party? (2) Could damages be given against the photographer? (3) Also, if the photographer registered the copyright in his own name in England (which he has no right to do), can the said American gentleman make any use of the said registration in action against the photographer?"—In reply: (1) and (2) In New York, no; but we think the sitter would have a case in this country against the photographer. (3) We take it that the registration would be fraudulent, and the sitter could have it annulled. See the "Copyright Act" in the ALMANAC.

THE DARLOT LENSES.—F. ROBINSON writes: "Wishing to get a lens of pretty good quality and suitable for all-round work I have offered to me a casket of lenses by "Darlot." There are eight lenses by which thirty odd combinations are claimed. They are some years old, about two or two and a quarter inches in diameter, and in good condition. Will you, through the correspondence column of your valuable paper, give me an idea as to their original value, and also as to their present value. For all-round use of amateurs, would these lenses compare favourably, or not, with an up-to-date lens?"—In reply: These lenses, if they are such as we are familiar with, are at times very useful, but they are very slow, inasmuch as the different combinations they form necessitate the employment of small stops in order to obtain good definition. As to the market value we can give no opinion, except saying that it would be very little as compared with their original cost. They will not, of course, favourably compare with the present up-to-date lenses.

STUDIO-BUILDING.—"LENO" writes: "(1) I had a new studio built about nine months ago. I asked the builder to have a board flooring, but he suggested a concrete floor, stating that it would dry. I left the doors and roof sash window open all the summer, and I have slow combustion stove for the winter months, but the floor is still very wet and damp in places if a piece of carpet, &c., is left down a few days. Can you suggest anything to be done, as I wish to cover the floor with lino? (2) Do you think the enclosed sketch of stove would be worth a patent in bringing it before the public as a useful means of heating studios and the like places where it is required to move the stove from the centre of the room to the side, thus leaving the centre clear? I find it a great advantage in the studio."—In reply: (1) If the concrete is not dry after so many months it is doubtful if it will dry at all. All that we can suggest is to board it over, keeping the boards a few inches above the concrete. (2) As to the commercial value of such a patent we can offer no opinion—that is quite beyond our province.

STUDIO LENSES, &c.—"STUDIO" writes: (1) Will you be good enough to inform me what the best type of lens is for studio work—large cabinet heads? We are so far from anywhere here that we cannot learn by comparison. I am putting up a studio and would like to have good tools. I have an excellent casket, varying from eight up to twenty-four inches focus, also a portrait lens by Slater, but it does not give me a big enough effect, and I like to work as far as possible from my subject. My studio is twenty-five feet from wall to wall, say twenty feet available. Is the Dallmeyer-Bergheim lens a useful lens, or is it a luxury? Would the diffusion given by it unfit a negative for enlargement? (2) Also, what are the best books on studio work, lighting, and toning?"—In reply: (1) The best lens for the purpose would be a portrait combination of about twelve inches equivalent focus, such as those known as "cabinet lenses." The Bergheim lens gives a great deal of diffusion of focus, and the negatives taken with it are not suitable for enlarging, unless very unsharp pictures are desired. (2) "Artistic Light," by Jas. Inglis: "The Studio, and what to do in it," by H. P. Robinson; and "The Lighting in Photographic Studios," by P. H. Duchochois.

SPOTS ON PRINTS.—C. CANTRELL writes: "Can you tell me the cause of spots on the enclosed print, printed on C.C. paper? The spots appear on some of them a week after finishing."—In reply: The spots are clearly due to particles of foreign matter coming in contact with the prints at some stage or other of the manipulations, and while the prints are wet. This is the proved by the fact that in the centre of the spots there is a black nucleus.

A COPYRIGHT QUESTION.—"BAKER" writes: "I have just photographed a concert party and used seven plates, two plates are used for two separate groups of the whole of the party, and the other five plates are used for separate figures and each figure is a part of the groups mentioned; all plates are good and fit to print from. Each person buys one at 2*s.* each. To whom does the copyright belong? No one person offered to pay expenses: I had to go to each person for payment."—It rather seems to us that the copyright belongs to no one. But much will depend upon the actual terms upon which you undertook to take the pictures—the arrangement you made at the time.

LEASE OF PREMISES.—"TENANT" writes: "I took this place on a three years' agreement, with the option of retaining the tenancy on a seven, fourteen, or twenty-one years' lease at the same rent, by giving three months' notice before the expiration of the three years. That expires in March next. I gave notice to the landlord last week that I would keep the place on a seven years' lease, and now he says he will not grant the lease at the same rental, because I did not give notice in time. Can I compel him to do so?"—In reply: We think not, as you did not comply with the terms of the agreement. The landlord can now make such new terms as he thinks fit, and we do not see that you can help it.

A BUSINESS QUESTION.—"RUSTIC" writes: "I shall be much obliged if you will give me your advice on the following matter:—For the past twenty years I have devoted much time to photography of all descriptions, and may, perhaps, without egotism, say that my work is good. I am anxious to take it up in a professional way, not as a portrait photographer, but to obtain an engagement with an illustrated paper, or with a firm such as Messrs. Frith and Co., to take such parts of the country as might be required, or attend race meetings, yacht races, &c. I know I can produce as good work as nine out of ten. I shall be glad if you will advise me as to the best course to adopt, whether a good introduction would be useful, or whether it would be sufficient to send samples of work, or whether a personal application would be better. I want to give all my time to it, and would be glad to visit any places abroad that might be considered interesting."—In reply: We should advise a personal application. Just now the view trade, as it is termed, does not perhaps offer so good a field as the illustrated press. A really first-rate photographer should find no difficulty in securing employment.

COLLODION PROCESSES.—A. W. SMITH writes: "I want to try moist and dry processes as given on pages 779-783 of 1896 ALMANAC, and should be much obliged if you could give me further particulars of them:—1. (p. 780), How would you prepare magnesia bath? 2. (p. 780), Are glycerine plates washed after silver bath? 3. (p. 781), How prepare gelatine? 4. (p. 781), How prepare gum? is it used hot? 5. (p. 782-3), Do albumen prints require soaking before development? 6. May iron developer be used for all above processes? 7. Is purely-bromised collodion proper for all? 8. (p. 754), Must linen for making pyroxyline be new? 9. (p. 774), How long would you immerse paper in sulphuric acid for a tough collodion? 10. (p. 774), And for a tender collodion?"—In reply: 1. Nitrate of magnesia 4 ounces, nitrate of silver 12 grains, glacial acetic acid 1 drachm, water 12 ounces. 2, 3, 4. We must refer our correspondent to any of the old manuals on photography, published between 1854 and 1860, for the details of working these obsolete processes, as we cannot afford to devote space in this column to matters that would be of no interest to the bulk of our readers. 5. No. 6. Pyrogallic acid was used for all. 7. No iodised collodion was used. 8. No. Old was preferred. 9, 10. It will depend upon the proportions of the acids and the temperature. See formulæ for collodions on pages 863-4 of the ALMANAC.

STEREO LENSES.—"BEGAN" writes: "Recently I purchased a sliding body stereo camera second-hand, with a pair of Dallmeyer portrait lenses, Petzval type, would you kindly tell me: (1) Are these lenses suitable for outside stereo work, say for street scenes, for instance? (2) They have Waterhouse stops, and also a stop screwing into the hood of the lenses. What is the use of the latter? it has rather a small aperture, and is removable. (3) Waterhouse stops are marked as follows: X, 2, X2, 3, 4, 5. What are these focus values? (4) I rather think that the movable stop in the hood is to use lenses as a landscape lens by taking out the front combination and transferring to back. Is this so? In this case are the Waterhouse stops to be used also, or may one or the other be used independently? The lenses appear to be excellent in quality and do very good portraiture used singly. I have not tried them for stereo work."—In reply: (1) Yes. If they are the usual stereoscopic lenses, they are specially constructed for that class of work. (2) Probably for use when the front combination is employed as single lens. (3) We cannot say without knowing the focal length of the lenses and the apertures of the stops. We may, however, tell you that the exposure is doubled with each smaller stop—thus No. 3 will require double the exposure of No. 2, and so on with the smaller ones. The stops marked X will only require half as long again as the next larger one. (4) Probably, yes. In which case the Waterhouse stops are not required.

ORTHOSCOPIC LENS.—R. BLYTHE. The diagram shows that the lens is an old Voigtlander orthoscopic lens of small size. It has no commercial value now, except, perhaps, for a museum. It will, however produce very good negatives, though the marginal lines will be somewhat curved outwards.

EXHIBITING PORTRAIT.—You are decidedly in the wrong. You had no right to have an enlargement made of the portrait of a sitter taken in the ordinary course of business, and exhibit it in the shop-window without the sitter's consent. You certainly can be compelled by law to remove it, and the legal expenses, if action is taken, you will find will be costly to you.

CASES FOR GLASS POSITIVES.—N. E. asks: "Where can I get a couple of leather cases for glass positives? I have got two very old ones to fit into new cases, and I have inquired at several London warehouses, and I am told that they are not stocked anywhere now."—Messrs. E. Mander & Son, Branston-street, Birmingham, will supply them, but we expect they will have to be specially made for you.

BATH FOR ALBUMEN PAPER.—T. CONROY writes: "Will you please tell me the strength that the silver bath should be for sensitising albumen paper? I have been using twenty-five grains to the ounce, and I can get no vigour in the prints. I an told that the bath is too weak. If a stronger bath than this is necessary, it will be very expensive."—To get vigorous prints, the bath should be at least double the strength of that mentioned. Most use a sixty grain solution.

SENSITISING POSTCARDS: STAMP CAMERA.—H. W. JAMES writes: "(1) I have seen somewhere a method of sensitising postcards and silk fabrics for printing purposes, and should be much obliged if you can give me the formulæ. (2) Can you tell me where I can procure, or how I can make, a camera for taking stamp-portraits?"—(1) Messrs. Marion sell a solution for the purpose, "Panak," ready prepared. You cannot do better than obtain that. (2) Portrait stamp cameras are supplied by all the large dealers—such as Fallowfield, Houghton, Marion, and others.

REDUCING OVER-PRINTED P.O.P.—H. MOONEY writes: "A customer has left me half-a-dozen photographs to make them lighter. They have been sent from the front, and have been printed very deep; in fact, there are two or three that are nearly black. I may say that they are printed on P.O.P. I shall be glad if you will kindly say how I can make them lighter."—It is doubtful if you will be able to reduce the prints successfully—you may ruin them. We should advise you to copy them. Or, if they are unmounted, you might make fresh negatives from them by contact printing, as they are so dark.

CONDENSERS; LIGHT FILTERS.—"PHOTOPHIL" writes: "(1) I should be very glad to know what sort of condensers and size you would consider best for projecting ordinary sized lantern slides at a distance of twenty to twenty-eight yards with three-inch diameter objectives. (2) Could you give me a recipe for cutting off all except the blue or violet rays in spectrum demonstrations? With all my solutions I get a good deal of green let through."—(1) The ordinary four-inch condensers, as supplied with the best class of lanterns. (2) We should recommend you to get a screen made for the purpose. Possibly Mr. Sanger Shepherd or the Kromskop Company can supply you with one that will entirely cut off the green.

HOLIDAY TRIP.—G. E. BLOGG writes: "I propose spending ten days or a fortnight at Easter in either Holland or Belgium. Can you please answer the following questions: (1) To which country would you recommend me to go to get the best subjects? (2) Is a passport necessary in either country? (3) Is permission required to use a stand-camera in the towns of either place? (4) Is there any difficulty in getting dry plates through the Customs of either country?"—In reply: (1) There is plenty of food for the camera in the old towns of either country, and travelling from place to place is very cheap. (2) No. (3) None whatever, so long as you do not impede the thoroughfare. (4) No, but label the boxes as photographic plates that must not be opened in the light.

OLD PORTRAIT LENSES.—"LENSES" writes: "I have two very old portrait lenses, marked as below (No. 1 is a Cabinet and No. 2 a C.-D.-V.)—No. 1, 'Photographie Terres Combines, Invente par Charles Chevalier, Palais Royal 158, Paris;' No. 2, 'No. 2015, Alexis Millet, Opticien, S.G.D.G., 160 R. St. Martin, Paris.' Lenses of No. 1, 2⅜ diam.; lenses of No. 2, 1¾ diam. Will you please to let me know worth of same, and whether they will be any use for studio work?" In reply: The lenses are probably the old form of quarter and half-plate portrait lenses, made before either the carte-de-visite or cabinet pictures were introduced. They may be useful lenses in the studio, but we expect you will find the field will be very round as compared with modern lenses for carte and cabinet pictures. We cannot say their market value, probably not more than a few shillings each.

VARNISHING.—"TROOPER" writes: "Please say which you consider the best and proper method of varnishing negatives—that is, before or after retouching. I rather like the idea of retouching my negatives first, and then varnishing, the varnish thus helping to keep the lead from being easily brushed off; but I find in almost every case that the act of varnishing after retouching brings away some portion of the lead, consequently I have to partly do the retouching over again. This I dislike, and would like your opinion on the matter."—The more usual way is to varnish the negatives first, and retouch them afterwards. If a good retouching medium be used, there is but little risk of the work being rubbed off in printing. If the retouching is done first, the varnish is liable to disturb it to some extent.

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EX CATHEDRÂ.

The late J. P. Robinson's Negatives.

Mr. Ralph W. Robinson, dating from Linkfield Corner, Redhill, writes to us:—"As enquiries are coming to Tunbridge Wells in reference to the possibility of procuring prints from my late father's negatives, if you can find space, I shall be much obliged if you will kindly state that the negatives are in my hands, and that in the course of a few weeks I hope to be able to supply sepia-platinotypes of all the favourite subjects, and that in the meantime all enquiries should be addressed to me at the above address." We have much pleasure in complying with this request. In the Camera Club "Journal" for March Mr. George Davison, in an appreciative biographical sketch of the late Mr. Robinson, thus happily characterises the latter's well-known combination photographs:—"The qualities which he aimed to include in and lend effect to his works were academic rather than naturalistic. His famous combination pictures always had a decorative appearance, and were full of personal interest. The telling effect secured in them was characteristic of his methods, and could hardly have been obtained so strikingly by any other means." In the long list of combination photographs produced by Robinson between 1858 ("Fading Away") and 1890 ("Carolling") there are many that admirers of his work would no doubt be pleased to have, and if such a list, with small half-tone reproductions attached, were published, it is probable that they would have a considerable sale.

* * *

Some Exhibition Points.

In our review of the recent South London Photographic Society's Exhibition, we referred briefly to the case of the judges at one exhibition reversing the decision of those acting at an exhibition held only a few days before, and commented upon the change made in the effect of two pictures simply by the alteration of the character of the lighting under which they were viewed. That there is such a change, of course almost everybody knows, and also that the apparent size and importance of a picture are affected by the conditions under which it is exhibited. It is quite a common experience, when one has seen a painting in a room or studio of ordinary dimensions, to fail at first in one's search for it on the walls of the Academy or a similar exhibition, simply because one is passing over pictures which may be about four times its size. We fancy that few photographers outside those who have bought their experience at the expense of many disappointments in securing at the hands of Selecting Committees that recognition of their work which they think it deserves, realise to what an enormous extent the effect of a picture, and particularly a picture in monochrome, such as a photograph is, can be influenced by its surroundings. We have often heard exhibitors at the Royal Photographic Society's Exhibition express their disappointment at their own work after they have seen it hanging on the walls, and it is quite a common thing for a man who has sent several frames, and had part rejected, to proclaim that the best work has been sent back, and the worst hung. It is just conceivable that such a thing might happen, but, considering the care that is taken by the R. P. S., in particular, and no doubt equally

by other bodies organizing exhibitions, in appointing on their selecting committees men who, from their knowledge and experience, may be trusted not to blunder, it is inconceivable that such an occurrence could be one of other than the rarest kind. We have not the slightest doubt that, apart from those arising from unreasoning vanity, and no exhibitor is entirely free from vanity, the greater part of the criticisms on the actions of selecting committees in the performance of their duty would not be made if there were an opportunity of viewing the work sent in to an exhibition as the Selecting Committee view it. It is notorious that practically the only fault-finders are those who have had their pictures rejected. It is human nature, and we cannot eradicate human nature from human beings. No alteration of system or of individuals is of avail. The wail of the disappointed is, and will continue to be, heard after every exhibition as surely as night follows day.

* * *

A Note on Mercurial Intensification.

Dr. E. Vogel, in the "Photographische Mittheilungen," says that frequently in intensifying negatives with mercuric chloride and subsequent blackening with sodium sulphite, insufficient density is obtained, either by allowing the sulphite solution to act too long, which causes the intensification to be reduced, or because the negative was originally too thin. Whilst negatives intensified with mercury and ammonia cannot again be intensified, at least, not if in the first case the mercury solution was allowed to act till the negative was quite white, or until complete conversion of the metallic silver into chloride of silver and mercurous chloride, the opposite is the case with negatives blackened with sulphite. These can, obviously, after a thorough washing be again bleached in the mercury solution, and then blackened with ammonia, and thus considerably greater density be obtained than in the first intensification. This peculiar fact may be very easily explained. A negative perfectly bleached in mercuric chloride solution consists of silver chloride and mercurous chloride. The former is, when treated with sodium sulphite, reduced to metallic silver, whilst with the mercury, with sufficiently long action of the sulphite, the image is partially formed of finely divided, and therefore black-looking, mercury. The deposit gives, by treatment with mercuric chloride, white mercurous chloride, which, as is well known, is blackened by ammonia with the formation of ammonio-chloride of mercury. The negative intensified with mercury and sulphite can be again intensified with the same solutions, and this may be repeated as often as desired, and there takes place a further deposition of mercury, as in place of the one molecule of metallic mercury, two molecules of mercurous chloride are deposited in the negative film, which, by treatment with sulphite solution, are reduced to mercury. Even this, however, gives considerably less density than when the blackening is effected with ammonia.

* * *

American *versus* English Cameras.

"The Board of Trade Journal" last week, in a report from His Majesty's Embassy at Washington, refers to the fact that the export of boots and shoes from the United States to the British Colonies, and to the British Isles themselves, had tripled in value during the last three years. This is attributed to the more extensive employment of machine and improved systems of working. But, it may be ask what have boots and shoes to do with photography? W nothing except to teach a moral. We venture to say, wi out much fear of contradiction, that the export of camer lenses, and shutters from the United States to England a her Colonies has considerably more than tripled duri the past three years. Why, it may be asked, is this t case, seeing that English cameras, alike for workmansl and stability, are so renowned all over the world, for camera by one of our best makers is a tool for a lifetim Yet, in face of this, the English market is being flood with American cameras, lenses, and shutters of differe patterns—and we hear there are more to follow—and th command a ready sale; but why? The cameras are w made, are light, and very portable, enclose in a very sm space, and have every adjustment conveniently arrange The lenses are good, and the shutters are excellent alike design and workmanship; and, what is more, the prices them are better within the means of amateurs with limit purses than would be apparatus with similar advantag if made by a British camera-maker. With these fac before us, it is not surprising that these American camer are having such a run in the English market. Usuall when foreign goods are sold here for a less price tha English ones can be produced for, the reason assigned that labour is so much cheaper abroad than it is here. Th certainly does not apply to American manufactures, f in the States wages rule from 25 to 50 per cent. highe than they do in England. The real reason with thes American cameras is that all the parts are made by wel designed machinery, some of which, even for making quit a subordinate portion, may perhaps cost some hundreds pounds. When all the separate parts are made in th way very little labour—and that not really skilled—necessary to put them together, as they all fit exactly int each other. Why, it may be asked, has America acquire the monopoly it has in this class of apparatus? Have w not here sufficient enterprise, and the necessary capital, t start similar factories to those turning out such larg numbers of cameras, lenses, and other articles in the States Turning from cameras to lenses: For years past Franc has had almost the sole monopoly in the manufacture o the cheaper forms of photographic lenses, and, so far a we can see at present, is likely to continue it, because it h no real competitor. If England produced similar lens even if they were a trifle higher in price, they would doub less be preferred by most purchasers to foreign ones.

* * *

Gum-bichromate Printing Simplified.

Dr. Simons, of Munich, gives in th "Photographische Rundschau," the fol lowing directions for working thi process, which is founded on a method worked out by Her Traut, of the same city. He points out that the proces is generally used for large sizes, and to make the enlarge negatives it is advisable to make a transparency by con tact on a lantern plate, and rather over-develop it, and then reduce with ammonium persulphate, so as to obtain a flat grey result. From this transparency an enlarged nega tive is made on platino-matt bromide paper. For the preparation of the bichromate paper, Schoeller's "Hammer glatt" was used, and this requires no sizing. The gum solution is made with 100 grammes of gum arabic and 100 grammes of water.

ie colours are the moist water colours in tubes, d the author used English red, burnt umber, and caput ortuum. The contents of each tube should be pressed t into a bottle, and 50 c. c. of water added. The bichromate lution is a 25 per cent. solution of ammonium bichromate, nich is preferable to the potassium salt, because of its eater sensitiveness. To make the sensitive mixture, mix c. c. of gum solution, 1 c. c. of bichromate solution, and c. c. of colour solution, and stir well. Spread the above iantity on a sheet of paper, 30×40 cm., with a stiff brush, id even out the marks with a soft badger-hair brush, and en dry in the dark. It should be printed under the gative, and, if Wynne's exposure meter is used, a normal gative will require up to No. 5, or about five or ten inutes in the sun. The print may be developed in a dish nder a stream of water, and the high lights, if required, axed out with a brush, and then the print washed by peated changes of cold water.

* * *

hortened Form f Astronomical elescope. Photographers have every reason to know the inconvenience of long-focus lenses—indeed it may be said that the remedying of that inconvenience is almost the sole raison d'être of ne tele-photographic lens. For hand telescopes the Porro rm has been adapted and improved upon, till instruments f great power, and small distance from object glass to eyeiece, have been produced. But to shorten this distance in rge instruments of, say, from thirty feet upwards by simiar means would be practically impossible, as so many large lane surfaces on a set of homogeneous pieces of glass of large imensions would be beyond the power of the expertest ptician. But the shortening, maybe, has been carried out in nother way. M. E. Schaer has recently described some experiments he has made at the Observatory of Geneva, with he purpose of lessening the inconvenience of working with huge telescope body and framework. He has been able to reuce the distance between objective and eyepiece to about one-hird its normal length. He effects this by the simple expedient of placing two mirrors—plane and silvered—so that the ays from the object glass, striking one, are reflected to the ther near the object glass, and from it back to the eyeiece; thus one-third of the focal length only is required to ring an image to a focus. When the instrument is required for solar photographic purposes the silvered mirrors re removed, and replaced by mirrors of glass only, without ilver. Views of the sun's surface were obtained by these neans in about one-fiftieth of a second.

* * *

nteresting Experiments with Hypo. In connexion with Mr. Dormer's article on the solubility of hypo, in our last week's issue, it is worth while calling to remembrance the fact that if sufficient heat be applied, hypo crystals are capable of dissolving in heir own water of crystallisation, to use a familiar form of expression, and, if care be exercised, the liquid will remain unchanged for months. The crystals should be placed n a glass flask, and heat applied till they "melt." If now he flask neck be plugged with a piece of cotton-wool, no rystallisation will take place upon cooling, and the flask can e gently shaken, days afterwards, without the liquid state hanging. But if a single very small crystal of hypo be dropped into the flask after removing the plug of wool, crystallisation at once starts, and very shortly the whole of the liquid turns to a solid mass of crystals. Bodies passing from the liquid to the solid state, as is well known, give off heat, and the same thing happens with the hypo. The flask, quite cold to start with, becomes, when the crystalline mass has formed, so hot that it cannot be held in the hand.

* * *

An Extraordinary Decision. Photographic dealers and others interested in the sale of "dangerous" or "poisonous" chemicals and other articles to photographers, must naturally be perturbed at the result of a decision given by a provincial jury one day last week. It appears, by the reports in the newspapers that at the Liverpool County Court, an action was heard in which Mr. J. A. McNair, an amateur photographer, sued Kodak (Limited) for £7 14s., for personal injuries sustained. The plaintiff, on Christmas-eve, bought from the defendants' Liverpool depôt two of "Eastman's Flash Light Cartridges," for the purpose of taking on the following night a flashlight photograph of a family group. In due course one of the cartridges was emptied into a metal cigar ash-tray. The plaintiff then lit the powder with a wax match. Instantaneously there was a "huge flash," and the plaintiff's right hand was severely burned. He sued for damages, on the ground that when he bought the cartridges no instructions were given to him as to how to use the powder, except that he was to light it. In particular, he was not warned that either touch-paper or a taper should be used. The defendants, on the other hand, alleged that a caution had been given, and resisted responsibility on that ground, and also on the general ground that people who bought such articles should, as a matter of reasonable and common knowledge, be aware of their possible danger if used as the plaintiff had used the powder in question. The jury found for the plaintiff for £5, and judgment was given accordingly, with costs. We have no hesitation in characterising this verdict as absurd. The view taken by the Liverpool jury simply means that any photographer who injures himself by the ignorant misuse of the chemicals he purchases is entitled to damages or compensation from the retailer. The verdict, in short, is against common sense, and we hope that the Kodak Company, in the interests of the photographic trade, will appeal against a decision which is so ludicrous that, if it can be upheld, even the sportive youth who on bonfire night inflicts self-injury by the incautious handling of a squib or cracker, stands a good chance of recovering substantial damages from the firm who sold him the fireworks without instructing him in their use!

UNIFORMITY IN PRINTING AND TONING.

In all instances where a number of prints have to be pulled from one and the same negative, the chief aim of a professional photographer is to produce each copy as nearly as possible similar in depth and colour. We see this strikingly exemplified in portraiture, a branch of photography which calls for especial care, in providing the utmost uniformity in the large number of prints frequently required from a single negative. In studio practice, where the different factors, such as lighting and development, &c.,

so necessary to the production of uniform results in the various negatives are well under control of the professional worker, there is no great difficulty in producing negatives so uniform in character that but little difficulty is experienced by an expert printer attached to such studio in printing and toning large batches of prints from a variety of negatives as nearly alike in depth and colour as two peas. On the other hand, circumstances might be narrated where even a professional printer would experience no little amount of difficulty in being able to produce anything like uniformity in a batch from what may be termed an indifferent printing negative. Under ordinary circumstances, when dealing with what may be termed good printing negatives, the adoption of one or two well-known methods of printing will always ensure success in so far as uniformity is concerned. Among the various factors so necessary to provide uniform depth in printing may be mentioned the providing of a sufficiency of paper in folded form as will produce at least four prints on each sheet of paper. This is accomplished by so folding the sensitive paper that when a portion of the same is in contact with the face of the negative and printing, a previously printed proof is folded backwards, and in full view when the printing frame is open for inspection. By this means the merest tyro at printing can in a moment detect when the portion which is in contact with the face of the negative and printing has reached exactly the same depth as the proof previously printed. Little consideration will be needed by any one to understand that, when charging the printing frame with a sufficiency of sensitised paper, it must be so cut as to yield at least, say, four prints on one and the same sheet when folded into four uncut divisions. The reason for this may, to some, not appear very obvious, for it might be imagined that by retaining a previously printed proof on a separate sheet of paper in the printing frame at the back of the paper that is being printed, the same end would be served as providing a larger sheet of folded paper. A little thought, however, will enable any one to understand that uniformity does not depend on printing alone. There falls also to be considered the equally important factor of toning, and that when this latter stage is reached it is far easier to tone the four prints as one, for they are virtually one, being on the same sheet, than it would be to tone four separate prints, as would be the case when each proof is printed on separate portions of paper.

In adopting this method of printing, there need be no fear of the image coming through on the unprinted portion of the paper at the back, for it is easily understood that as the printing proceeds the darkening of the paper that is being printed protects the sensitised portion of the back. By so folding a sufficiency of paper as will yield four prints, it is remarkable how exactly the same depth of printing can be struck, provided that equally important factor, viz., personal equation, be borne in mind, for it stands to reason, when printing, close attention to the frames is at all times an absolute necessity where uniformity is to be acquired in the resultant prints. Any difficulty, as a rule, does not lie in the printing of a negative to the requisite depth of colour; it is when the toning stage is reached that errors in manipulation will become apparent. With some samples of paper the time occupied in printing plays an important part in yielding a desired colour in toning, and, whenever possible, provision shou be made to so print a negative that the proofs can pulled off in nearly the same space of time. When th can be accomplished such prints seldom give any trouble toning where a systematic method of performing this ope tion is provided. Many clever workers prefer to tone wi the aid of gas or lamp light; by such means the eye becom acquainted with the various changes that occur, and a litt practice enables them to produce a large batch of prints a very uniform manner. Another case in which prin are required to be of absolute uniformity is when a colle tion of a number of photographs are required for exhibiti purposes in one frame. In cases of this kind, where qui a number of negatives are called into requisition to yiel the desired number of prints, the operation is not so eas of accomplishment, for, as a rule, different negatives thro varying qualities of prints, and consequently offer mo difficulty to procure an uniformity in colour. By, hov ever, paying strict attention to each negative, and emplo ing the paper in folded form, as previously described, an retarding the thinner or more rapid printing negative, b means of ground glass or tissue paper, until the time occu pied in printing corresponds to the denser class of negative much will be accomplished in the matter of procuring un formity in toning. Prevention is at all times better tha cure, and, whenever possible, uniformity in depth an colour should be provided without recourse to any after method of treatment, such as reduction of over-printe proofs by means of a chemical agency.

With a professional worker economy means something and even the most attentive operator will at times mak slight errors by overtiming his frames and producing proof that are just beyond the proper depth. To discard such prints would mean a serious loss both in material as wel as time, hence recourse must be had to doctoring such over printed proofs. This is easily accomplished after a batch of prints are toned and fixed. At this stage a sligh scrutiny will suffice to reveal any print that would benefi by being doctored, and, if such prints are taken individu ally and placed on a clean white linen sheet, alongsid those that are just right, they are easily detected, an after a slight amount of washing by themselves are sub jected to a weak ferri-cyanide bath, which is very easily prepared by dissolving a few crystals in a sufficiency o water until the colour is about that of a primrose yellow If this bath be not too strong the prints will be reduce nice and slowly, and the operation well under the contro of an operator, who can easily stop the action when the proper amount of reduction has taken place by removing the print to a dish of water kept close at hand. By this means even prints from varying negatives can be made to yield uniform results with the greatest ease. A golden rule to remember in printing is this, viz., an over-printed proof is amenable to treatment, and can with care and judgment be reduced to just the desired depth; but with under-printed proofs the only thing that can be done is to consign them to the wastepaper basket. Another excellent method of treating over-printed proofs is to select those that require reduction from the rest of a batch when removing them from the hypo, and by placing a fair-sized crystal of ferri-cyanide of potassium in the hypo bath to permit the over-printed proofs to remain in the doctored bath for a longer period, attention being bestowed upon

ir removal when sufficiently reduced. In process work, ere it often happens that several prints have to be com- ed in one block, the question of uniformity is one of no an importance, and at times such prints have to receive eful treatment in the matter of reduction before being ied through the screen. The operation is one calling a little close attention on the part of an operator, and, en such is intelligently bestowed, it is surprising what improvement may be effected in the results obtained.

THE METRIC SYSTEM.

your correspondence columns testify, the subject of the general ption of the metric system in photographic formulæ is again rossing a considerable amount of attention. In your last issue orrespondent suggests that dealers should assist the movement by ding chemicals by metric as well as by the present standard ights and measures. This would, of course, entail extra trouble to dealers without, I surmise, tending very much to the furtherance the object in view. The purchaser would still have to compound m, therefore, what matters it whether he purchases the bulk under avoirdupois or the metric system? There is, however, a way in ich dealers might assist more than they do, that is by making a ture of metric weights and measures at about the same price as se on the English system. At present there appears to be an pression amongst photographers—or amongst many of them—that e necessary metric weights and measures are costly. There is me ground for that idea, inasmuch as they are not stocked erywhere, and, when procured to order, it is not an unusual thing r a somewhat fancy price to be charged for them. There is no ason why this should be so, for the graduation of measures der the one system is charged no more for than by the other. e price for the work is simply governed by the numbers of the aduations. The same with the weights, they cost no more to make. I possess a set of metric weights with which I can weigh from one ntigramme to three hundred grammes—over ten ounces. They are foreign manufacture—French or German, I am not sure which; think the former. They are very accurate, and are fitted in a at polished wood box—each weight in a separate compartment—d the cost, if I remember rightly, was but about four shillings holesale. I have also a set of four glass measures with which I can easure from five minims to one quart, or from one c. c. to a litre, r the measures are graduated on the one side according to the old ale, and on the other according to the metric system, so they serve dual purpose, and there is consequently no trouble about the con- ersion of formulæ. These measures were the same price as the rdinary, plus only the cost of the extra graduating. On the weights e have, with number punches, stamped the nearest equivalent, in ound numbers, in English grains. Here again there is not, what is o some a trouble, the question of conversion of one system into the ther; the weights and measures themselves indicate it at a glance. Thermometers graduated on one side according to the Fahrenheit cale, and with the Centigrade on the other, have long been articles f commerce, and with these there is no trouble about the conversion f the two scales, as they are both seen at once. I fancy that if dealers are to help in developing the metric system, it should be ather in the direction of supplying weights marked, and measures raduated, under both systems, so that they can be used for either, at moderate, though remunerative price. This, I surmise, would acilitate the object much better than that of vending the materials hemselves according to the metric system. A. F. Whitworth.

PUBLISHERS AND PHOTOGRAPHERS.

[Reprinted from the *Publishers' Circular*.]

Very few who have had anything to do with the publishing of illustrations can have altogether escaped the fee-demanding photo- grapher, and those who have escaped may possibly benefit by a word of warning as to the unsatisfactory condition of the law as regards copyright in photographs.

For illustrating books, magazines, and newspapers it is often necessary to buy engraved blocks, or borrow them, or import sheets in which they are printed; the greatest care may have been exercised to ascertain as far as possible that no rights will be infringed, and yet in hundreds of cases no sooner is the work or periodical published than the publisher receives a letter from some photographer claiming copyright in some of the pictures, and demanding fees for infringe- ment.

It is, of course, always advisable, where there is any doubt, not to use the picture if its use can be avoided. Also, the party selling the illustrations should be made responsible beforehand for any infringe- ment of copyright.

It often happens that a publisher wishes to give a portrait of some person and asks for a photograph, but it will not do for him to assume because the person sends a photograph of himself that it can be copied and published; the copyright may belong to the photo- grapher, and the question whether it does or not is always much more easily settled before than after publication.

Or a publisher employs a photographer to take a portrait for him and pays the photographer for the one he uses; but the photographer when taking the accepted portrait takes other photographs at the same time. On the death of the person photographed the photo- grapher claims the sole copyright and right to publish the rejected portraits, on the ground that he took them and was not paid for them; the fact being that he was paid for the one used, but may never even have asked for payment for the rejected proofs.

It appears to be pretty certain that the Photographic Union keeps a registered set of all photographs taken by its members, or all that they care to register, and that every book and illustrated magazine and paper is carefully searched for infringements. There is not the slightest reason why they should not do this, and, of course, in every instance where a photographer has obtained permission to take a portrait with the view to his being the sole owner of the copyright, or in cases where he takes photographs of scenes or objects on his own initiative and for his own use, his rights should have full protection.

The writer of a book or contributor of an article to a magazine sends photographs to illustrate it, blocks are made, used, and perhaps one or two are lent to another publication to accompany a notice of the book or article, then publisher No. 2, who has merely borrowed the illustrations, gets a demand for compensation for infringement of copyright.

This is rather hard on publisher No. 2, though it may be a per- fectly legal claim on the part of the photographer.

The thing to bear in mind when giving a photographer an order for photographs, if you want to secure the copyright, is to have a clear statement in writing from him that the copyright in all the photo- graphs he takes, whether you use them or not, is to be yours, other- wise you may find that the value of the portrait or picture you have been perhaps at much trouble and expense to procure is discounted by the existence of rival pictures, not identical, but for all practical purposes equal to yours, and perhaps sold to some rival publication. Quite possibly it may have been only through your influence that the photographs could be obtained at all. Of course no honourable photographer would condescend to double dealing of this kind.

Copinger says: "As to photographs, the copyright in non-com- missioned works belongs to the photographer if reserved in writing. and in commissioned works the negative and the glass on which it is, is usually considered to belong to the photographer, while the copy- right belong to the person who gives the commission."

In order to avoid the pitfalls incidental to the present state of the law, as regards copyright in photographs, some publishers employ a photographing staff of their own, and even then we believe they have an agreement with their men that the photographs they take are the copyright of their employers.

Where negatives on glass are borrowed it is well to arrange with the photographer beforehand as to the amount of compensation to be paid in case of breakage. A safer plan still is to have a duplicate made.

If we are correct in our surmise that one of the duties of the Photographic Union is to search illustrated books and periodicals to ascertain if photographers' copyrights have been infringed, might it not be a good thing if the Union would undertake for a small fee to give, when they can do so, the address of the owner of the copyright of any photograph about which there is any doubt?

The majority of photographers are most reasonable in regard to their "rights," but there are black sheep in all trades, and we know cases where extortionate claims have been made for infringements or alleged infringements.

THE DARK ROOM, PSYCHOLOGICALLY.

The need of a dark room is peculiar to photography. This is unfortunate, but, so far, inevitable. The man who will show how to do without it will prove a greater benefactor than he who succeeds in registering colour. Some slight progress has been made to this end, in spools of sensitised films that can be changed in sunlight, papers that can be developed by ordinary gaslight, and so on. As indications of possibilities ahead, they are very welcome; but, so far, the dark room is absolutely essential. Everybody dislikes it more or less—generally more—and endeavours to make his stay in it as short as possible. This is in some measure due to the fact that it is the worst room in the house, that, in possessing the smallest window, lends itself with least alteration to conversion into a dark room. It is the smallest room generally—or the largest cupboard—and as markedly deficient in ventilation as in light. It is not, however, in a narrow way with this type of dark room that we would deal. The man who starts in the cupboard under the staircase will soon naturally clear out into better quarters if he gets on; if not, he will just as naturally drift out of the photographic field altogether.

However well arranged and comfortable a dark room may be, it is still a dark room. It is the absence of light that makes it so peculiarly disagreeable to work in. There is a complete reversal of the great condition under which all other work is conducted in life. Darkness, or what comes to much the same thing, rushlight glimmer, is associated in every direction other than the photographic, with rest and sleep. All living things, vegetable as well as animal, crave for light, must have it indeed. Every flower and tree pays homage to the sun by bowing to it as the source of light. All animals acknowledge its beneficent power in their individual ways. Man is no exception. The rule is universal, from the West Indian basking in the excess of sunlight to the prisoner wearing with pathetic tread the flags of his dungeon floor on its lighter side. This craving for light is not due to any exercise of reason, but is instinctive. It is a heritage acquired through a long process of evolution in the open air towards physical well-being. Working in opposition to such a general and deeply implanted instinct must mean working at a disadvantage. The deep-lying and inconceivably complex physical changes in the molecules of brain matter that mean thought, and the highest type of work, accustomed to the broad soothing effect of light when in action, resent its absence. They cannot move and arrange themselves as easily into the crystallised, or other perfection of, form necessary to the turning out of a clear idea when light is absent. The result is the fidgety restlessness that most people experience when fully awake in the dark. The conditions of the dark room are worse even than this. Not only is the light the lowest in degree possible, but the worst in kind. Whatever the reason, red is less readily tolerated as a colour generally than any other. That is in mass, or for any length of time. Relieving small contrasts of red are very agreeable, such as the red tiles of a village smithy, or the warmth of brick in an old Elizabethan house. But splashes of red must be infrequent to be at their enjoyable best. If all the village tiles were red they would not be so pleasant, nor would a terrace of red brick houses without the relieving green of tree and park and field. Imagine the reds and greens of nature reversed! Red fields and green tiles! What an unnatural-looking world it would seem! The reason for large tolerance and appreciation of one colour more than another is not due to the colour itself at all, but to ourselves. We have become physically adapted, and consequently have acquired the special state of mind, towards a particular colour, as the result of long habit of looking at colours in certain ratios or frequencies. In a distant Martian world, where grass may be red instead of green, it is logically very conceivable that the states of mind of its inhabitants may be exactly the reverse of ours. Their railway danger signals may be green, and not red. But, instead of wanderings into a distant sphere, it would be more to the purpose to apply the broad facts we are certain of to our present purpose in discussing the dark room. Low red light is instinctive disagreeable, and the character of the work done by it must suff from the fact. The remedy is also clear, the substitution of more lig of a better psychological colour. An ounce of fact is worth a pou of theory. We have a pound of fact in proof of what has been stat and suggested in the experience of one of the leading firms of pla makers. They found that their employés when working by a re light were restless, excitable, and very tired at the close of the da The substitution of a "cathedral green" light created an immedia and beneficial change. The neurotic exaltation of spirit gave wa to a soothing and steady calm, and the old tired feeling of the even ing disappeared. It goes without saying that the amount an character of work under the altered conditions were also muc bettered. Here is surely ample proof, not only of the pudding, bu even of the sauce. If this change could be accomplished in the cas of the wholesaler's dark room, it can be in that of the individua worker. Admit more light, and let it be a suitable green. If an element of risk should develop in handling plates in a green light, it i very certain that if a demand for it became imperative, th difficulty would soon be met and overcome. Plates have been made specially sensitive to certain portions of the spectrum, and less sensitive to others, to meet particular purposes. It will not prove insurmountable to make them colour sensitive to suit brain and soul, more than to suit the yellow of autumnal leaves. It is far more reasonable to act upon this line than to force brain and soul into agreement with plates. The age of plates is but as of yesterday compared with the unnumbered ages that have stamped their indelible impress upon brain.

The argument looks a bit startling at the first glance, but it is so because it is an attempt at applying rule and compass to an instinct, something that in a vague sort of way we think beyond the natural possibility of measurement.

There is, as already hinted, one far better way out of the difficulty, such a development and departure in plates and paper as would make even a green light unnecessary, otherwise that photographic work be carried on like that of the artist in fair white daylight. This is the ideal to the aimed at, and, until it is reached, the very best photographic work posible will not be reached. As it is numberless little factors that help a worker out, even though he be not conscious of their effect, are absent. The artist, for instance, when tired of looking upon one spot on the canvas can lift his eyes and look out through the window, or upon some article in the room. The existing dark room does not admit of this refreshment. The only relief practicable is a motto in phosphorescent paint, "Bless our Home," in a homely way, or, say, "Ars longa est, vita brevis," in a more pretentious and classical. But "our home" would look altogether too unearthly for blessing in so ghostly a presentment as luminous paint, and the latter half of the other statement, for the same reason, might be rubbed in too hard for comfort.

We must live in hope of the coming of the full untainted light. Until it does come, it would certainly be worth while enlarging and re-glazing our dark room windows, for a closer approximation to that psychological ease that must be an essential factor in the turning out of the highest work.

THE BECK-STEINHEIL CONVERTIBLE ORTHOSTIGMATS.

To meet the demand for sets of convertible lenses, Messrs. R. & J. Beck, Ltd., have composed four sets useful for plates from lantern or smaller to half-plate or 7 × 5, of which they send us the following particulars:—

The sets are arranged by selecting single combinations from the Series I. of the Beck-Steinheil lenses, and adapting them so that they will all screw in register in one mount, thus obviating the necessity of having a number of complete lenses. By this system the possessor of three single combinations has at his disposal lenses of six different foci, varying in rapidity from *f*·6·8 to *f*·7·7 and of *f*·12·5, and giving foci in the case of the quarter-plate, as detailed below:

SET No. II.—FOR $4\frac{1}{4} \times 3\frac{1}{4}$ PLATES.

Half Comb. of Lens No.	Focus.	Aperture.	Angle.	Plate covered.
2	7 in.	*f*·12·5	41°	$6\frac{1}{2} \times 4\frac{3}{4}$
3	$8\frac{1}{2}$,,	*f*·12·5	36°	8 × 5
4	10 ,,	*f*·12·5	30°	9 × 6
2·3	$4\frac{1}{2}$,,	*f*· 6·8	62°	$4\frac{1}{2} \times 3\frac{1}{2}$
2·4	$5\frac{1}{8}$,,	*f*· 7·7	54°	5 × 4
3·4	$5\frac{1}{2}$,,	*f*· 6·8	49°	6 × 4

Each set is made up as follows:—

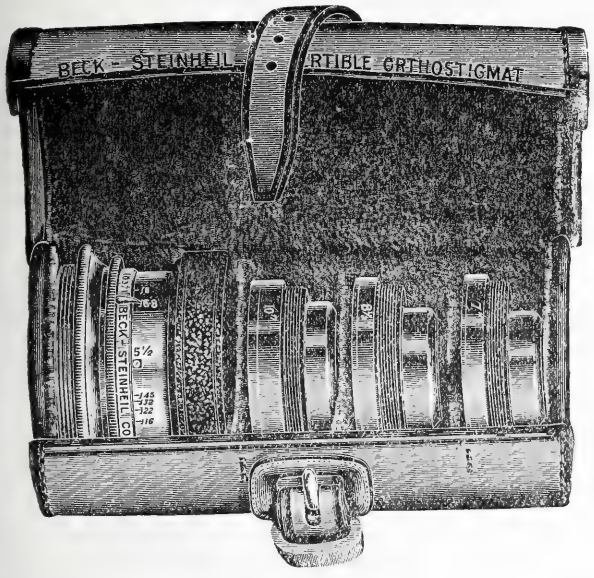
1. A setting or mount, into which any combinations will screw, either in front or behind the iris in register.

2. Three combinations of the Beck-Steinheil Orthostigmat Series I. of foci as selected and working at *f*-12·5 respectively, each being clearly engraved with its equivalent focus on its cell.

3. A special reversible aperture ring engraved with diaphragm sizes for all six lenses.

4. A hood carrying a cap to screw into the lens mount when no combination is used in front of the iris.

5. A solid leather sewn case to take all the components. There being only one iris diaphragm and six different foci, some confusion might arise over the apertures; but this is overcome by the use of the reversible



cover tube or aperture ring, which slips over the ordinary lens mount, and contains all the apertures for the lens when used as either of the three doublets, the apertures for the single lens being engraved along one edge of the aperture ring, and those for the doublet on the other edge. To change from one to the other, the ring is simply reversed. This is supplied with all the sets.

THE PROPOSED PROFESSIONAL PHOTOGRAPHIC ASSOCIATION.

Many of the letters that are printed in our correspondence columns this week deal, it will be observed, with various phases of the Ogden-Lever "invasion," and some of them express approval of our last week's suggestion that a representative organization of professional photographers should be formed, charged with the duty of guarding their many interests. We have no wish to limit discussion on the grave state of affairs created by the inroads of Messrs. Ogden and Messrs. Lever—the subject is so important that it cannot possibly have too much attention in these columns—but we conceive that the more immediate interests of our professional readers will be best served by considering the readiest means of converting into effective counteraction the widespread indignation which photographers clearly feel at the proceedings of the soap and cigarette trespassers. In addition to the letters printed elsewhere, we have also received the following. They have been written, it will be seen, by photographers in all parts of the country, and they are unanimous on the need of some such association as we referred to last week:—

"As a professional photographer, I think your proposal of a Photographers' Protection Association the most feasible."
J. Chivers, 25, Sidmouth-street, Devizes.

"I am strongly in favour of an association to protect the interests of professional photographers, and shall be glad to become a member of the same if formed."
George E. Houghton, 55, Fort-road, Margate.

"I, for one, have often wished to see an association in the interests of photographers, but at the same time it would need to be against all who cut down and deceive the public in any way."
Charles Spence, The Studio, Dunbar.

"With reference to your suggestion as to forming an association of professional photographers for the protection of their mutual interests, we beg to say that we are prepared to give any such association our full support, and attend any meeting that is called for that purpose."
Newton and Co., 19 and 21, Fife-road, Kingston, S.W.

"I should be pleased to join any scheme if started. I quite agree with one of your correspondents that the new blood (to which I belong) in the business will prove more energetic than the old in the matter. Thanking you for your kind offer of service in the task."
T. Everitt Innes, 108, Wellington-road, Heaton Chapel.

"Please add my name to the list of those in favour of some scheme of combination of photographers, as suggested in last British Journal of Photography."
Alfred Mallett, The Studio, Christchurch, Hants.

"Allow me to thank you for proffered help. Would like to read next week you want a good subscription from every photographer in the country."
Dennis B. Seaman,
2, 3, and 4, Castle Mona, Douglas, and 75, Lime-street, Liverpool.

"We are entirely in accord with a movement to facilitate the binding together of British photographers, and will willingly lend our aid, and will support any movement to forward this idea; we are willing to rally the men in our district—ten or twelve."
John Pratt and Co., Photographers, Greenock.

"We shall be glad to join any society or union that may be formed. The letter in last week's Journal, signed "An All-Alive Old 'Un," is what we intended when the advertisement first appeared, and we approached some cigarette firms on the matter."
Rose and Coop, 135, Regent-street, London, W.

"They say 'it is an ill wind that blows nobody good,' and if this unfair competition of Messrs Ogden and Lever, once for all stirs up the photographic profession to look after their own interest and form an association worthy the name, it will prove itself to be a blessing in disguise. I, for one, will willingly join such an association, and give it such support as may be necessary."
John Howie, Imperial Studio, Orchard-road, St. Anne's-on-Sea.

"I think the idea of a photographers' protection association an excellent one. We are a mighty army in the United Kingdom, surely something could be done to stem this degradation to our profession. I should be happy to help in any way, and sincerely hope that with one accord photographers will protest against this, to quote Miss Arnold, 'Filching from another man's hand and brain.'"
H. A. Aylward, 17, Wote-street, Basingstoke.

"If an association of professional photographers is to be formed, I should be most pleased to give assistance in forming the same. I think it is high time that something should be done to protect our interests, and they cannot be protected in any other way than combining together and forming an association."
Rupert Goodchild, 5, Laurel-bank, Alexandra-road, Manchester.

"As you ask for opinions of photographers, re forming a photographers' protection association, I think the idea a good one, and shall be pleased to join if it can be organized. I shall be pleased to subscribe my mite towards carrying it out. No doubt, if we had had a society as above it would have been done before now, but what is everybody's business is nobody's. We must have a centrally governed body, who must collect the wherewithal from the members, and take the initiative."
W. Thorneycroft, Newport Pagnell.

"I have read with great pleasure your remarks re the professional association for the protection of the photographic trade or profession, and shall be only too pleased to contribute my mite when necessary. I certainly agree with what Mr. Kenworthy says, page 156, and although I am not a man of means, I think I could subscribe my little lot towards the formation of a photographic co-operative society, and to manufacture our own plates as well."
Albert England, The Studio, Triangle, New Barnet.

"I shall be glad if you will add my name to any association of professional photographers which may be started to defend our work from being pirated by tobacconists and soap-boilers. I wonder who copies and prints these photographs for Messrs. Ogden, Lever, and Co.? They certainly will not do so themselves. I expect they hand the half-a-crown and photograph over to some trade firm of photographers, who, in all probability, suggested this mode of advertising. I think the combination of photographers should begin by trying to find out who does the actual work, as they will probably be at the bottom of the whole concern."
John Moffat, 125, Princes-street, Edinburgh.

"I am delighted to find that photographers generally are beginning to realise the truth of the old adage, 'Union is Strength.' I have long thought that the profession would be more prosperous if united, as they would not then be so helpless in the face of plate-makers' combines, &c.; and, now that a new danger is upon us, some sort of combination is urgently needed, as certainly nothing can be done individually. I sincerely hope that the present agitation will not subside before some really useful association has been formed which will have my warm support."
G. Ridsdale Cleare,
The Studio, 97, Lower Clapton-road, Lower Clapton, N.E.

"We, the undersigned professional photographers of the city of Peterborough, protest against the unjust competition by certain large

firms mentioned in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY, and which threatens to materially injure the profession in general throughout the United Kingdom. We therefore desire to express our approval and support of a proposal to institute a photographers' protection association—as put forward in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY of March 8, to guard the interests of all professional photographers, and to insure us, as far as possible, against the infringement of our rights in the future. We urge all professional photographers to combine with us in this effort to assert ourselves as a body, for it is not until such an association is an established fact, that we can expect to maintain our honourable position against unfair competition, or can reasonably hope for better things in the future."

Signed—J. HAMILTON CHRISTIAN; S. BUSBY COX; T. N. GREEN, pro Ball and Co.; ARTHUR A. HEALEY, pro W. Boughton and Sons; HARRY MARRIOTT, pro Eastmid Co., Ltd.

"As a photographer, and as one likely to be affected, more or less, by Messrs. Ogden and Messrs. Lever Brothers' despicable scheme to reduce the art of photography to a mere mechanical process, and so bring about a system of sweating, as injurious to the profession as it is degrading, I welcome the idea of a general organization of photographers, and I sincerely trust your kindly offer to aid that organization will meet with the hearty and spontaneous response which it deserves. We photographers have been so intent on waging civil war in our own domains that we have paid little or no heed to the stealthy encroachment of the invader, but unless our forces now combine, and make one united effort to check this invasion, we may realise when too late that the enemy has triumphed, and is in full possession of the citadel. It is a true saying, 'Union is Strength.' Photographers, individually, are absolutely at the mercy of the capitalist; but, combined, we should bring a formidable force against him. Therefore, to all photographers, principals or employees, in whatever branch of the profession you may labour, I would say, 'Unite, shake off the old spirit of suspicion and reserve, be men, and demonstrate and maintain your rights.' To Mr. Kruger and his minions the British, as a nation, owe a debt of gratitude, in so much that they have consolidated the Empire in a manner that the world dreamed not of; likewise the action of Messrs. Ogden and Lever Bros. may possibly result in a great union of photographers throughout the country, which will be to the advantage of the profession."

S. R. SCHOFIELD, The Excelsior Studio, Atherstone.

So far, so good. We have been very pleased at the receipt of these letters, the spirit of which leaves no doubt as to the existence of a great and deep wish on the part of many professional photographers to join hands for the common good. It may be as well if we recapitulate here the heads of our last week's suggestion in regard to the proposed association. We then wrote:—"The present emergency has provoked numerous powerful pleas for the formation of a representative organization of professional photographers charged to guard their many interests. A well-administered, centrally governed body of this kind, supported by the whole of the profession in Great Britain and Ireland, would be a tremendous instrument for action in crises such as that of the present moment, and others imminent or to be conjectured. If we can plainly discern amongst the 5000 professional photographers of these islands a strong and sincere demand for such an organization, we are prepared to take steps to facilitate its formation. To sum up: a great combination of professional photographers of England, Ireland, and Scotland, seems to us to be imperatively called for, and we invite the views of our readers on the subject. If within the next ten days a sufficiently large number of letters favourable to the idea be addressed to us we shall be happy to assist the movement by every means in our power. There is a very wide field open for a Professional Association." Encouraging in tone and numbers as the responses to our appeal have been this week, they leave scope for a vast addition to the list of those who are favourable to the formation of a Professional Association.

We have many other letters of approval which we shall print next week. Meanwhile, we earnestly call upon professional photographers in all parts of the country to signify to us their adhesion to the scheme of the proposed association. The entire photographic profession of these islands is menaced by a state of things so grave that unless a numerically strong and powerful organization be formed to deal with it, widespread disaster must inevitably result. After a twenty years' direct association with photography, we say deliberately, and upon full consideration, that the Ogden-Lever "invasion," is the most serious attack on the stability of photography as a business that has been made. Moreover, from an absolutely reliable source we learn that the "twelve bromides for 2s. 6d." idea is but the first of a series of attractive offers to the public, which are to be submitted to large advertisers, such as Messrs. Ogden and Messrs. Lever. If this kind of extraneous competition is not soon met and defeated the effect of it all will be, in the plain language of the time to "wipe out" a good many professional photographers, and to divert their business into other channels. Hence, with all the emphasis at our command, we beg the professional photographers of Great Britain and Ireland to seize this critical opportunity of combining together for purposes of mutual protection and interest. Outside competition, discounts, copyright, price-cutting, professional law and practice, and many other matters offer unlimited work to a professional association. If ever the time was ripe for such a body, that time is now. We are already in communication with some leading photographers with a view to the formation of a provisional committee, the calling of a meeting, and the taking of other steps necessary to realise the widespread wish for the formation of a professional association, and next week we hope to give full particulars on these points. Meanwhile, let us have more promises of support for a movement designed to avert from a great and honourable profession the appalling catastrophe of partial extinction!

PHOTOGRAPHIC EXHIBITION AT PERTH.

THIS week the photographic section of the Perthshire Society of Natural Science opened their Exhibition in the Picture Gallery of the Sandeman Public Library, Perth. The section, which is a powerful one, should congratulate themselves on their good fortune in having the use of so fine a gallery. The Society has followed in the wake of British artists by having no classification of any kind, and abolishing the competitive element. This is as it should be. Speaking generally, the work shown has evidence of much care, and no little pictorial knowledge. There is, however, that quality of uniformity which is so easily recognised at photographic exhibitions nowadays, pointing, as it does, to the fact that our leaders are either standing still, or the younger men are making rapid strides in the art of pictorial photography. There is not that individuality and striving after original effects that there should be, hence the general levelling up.

The suitable framing of the majority of the exhibits is a step in the right direction; many of the frames have evidently been chosen to show the works they hold to the best advantage. Nothing but praise can be given to those who are responsible for the hanging of the exhibits, which is exceedingly satisfactory, while the individual pictures are seen to abundant advantage. The general ensemble is very harmonious and effective. The total number of frames on exhibition is 110. In the space at our disposal it is impossible to mention all the work which calls for attention as being of a high order and showing good artistic treatment.

Mr. A. Stevenson Nicol exhibits a picture entitled "Nightfall, Perth Harbour." If we mistake not, this is a "gum-bichromate print" on a paper of a dark greyish tint. Though it may not attract the casual visitor, it will undoubtedly catch the eye of the student of photographic processes and progress. How much of it is due to photography and how much to "treatment," we can only imagine, but the resulting print is a gem. Perhaps it loses a little in value by the slight lack of balance. Mr. Alfred W. Brown has a few pictures in which there is evidence of a distinct striving after effect, and with greater experience this worker will be heard of again. Composition seems to be his weak point, and the study of the painters should remedy this. The seascape by Miss Jamieson has much motion about it, the breaking waves being well rendered—altogether a dainty piece of work which pleased us very much. "Porridge Time" is perhaps the best thing that Mr. Wm. Ellison has sent, though all his figure studies show considerable care and patience. This one, however, is a well arranged and executed piece of genre work, well worthy of study by those interested in this branch of photography. It is a masterpiece of concentration and detail—a work of marked individuality—simple in treatment, but thoroughly satisfying. "Chrysanthemums," by the same man, is a fine piece of technical photography, which improves on closer acquaintance. Mr. W. B. Mercier has a nice thing in "Summer," an ozotype print which does ample justice to Mr. Manly's process. This picture owes much to its beautiful colour, a beautiful sepia tint. Messrs. Thomas Dow, A. M. Rodger, A. S. McKenzie (the Hon. Secretary) exhibit some signally delicate and satisfying work. Besides those mentioned, there are many other pictures that could be selected as typical of the work of the various members. There has been a large attendance of the general public, testifying to the attention photography is now attracting.

Our Editorial Table.

CATALOGUES RECEIVED.

The Thornton-Pickard Manufacturing Company, Altrincham, Cheshire.

THE ten examples of shutter work, ranging in rapidity from 1/10th to 1/500th of a second, that are printed in the Thornton-Pickard Company's new catalogue are very fine specimens of photography

deed, and impart to the little book of 56 pages a distinctive character holly in favour of the company's well-known shutters and apparatus, ie capabilities of which, in skilled hands, are illustrated to perction. Amongst novelties we note the "Focal plane" hand camera, ith a self-erecting front and focal plane shutter; a new shutter, ie Iris, and a telephoto lens. These we hope to have the opporunity of examining in detail on a future occasion. Meanwhile, let s say that the catalogue, which fully describes all the apparatus for hich this esteemed and successful company is noted, should be in the ands of all those whose thoughts with the opening of spring turn) outdoor photography and its unfailing pleasures and delights.

The Zeiss Catalogue.

Published by Messrs. Carl Zeiss, Optische Werkstaette, Jena.

By the courtesy of Dr. Paul Rudolph, we have received a copy of he latest catalogue of photographic lenses issued by the renowned ptical house of Carl Zeiss, of Jena. The book, we may mention in passing, is neatly bound in light cloth, extends to 126 large pages, nd is altogether a splendid example of the typographic art. Besides he ordinary illustrations, there are 40 phototypic reproductions from hotographs. Though the latter are shown chiefly by reason of their ptical interest, they are nevertheless distinctly artistic in character, nd form excellent pictorial embellishments to a beautiful book. Messrs. Zeiss, it seems, have simplified the nomenclature of their enses. Thus we now have instead of the aforetime confusing series ., series II., series III., and so on, distinguishing names such as the Protar, the Double Protar, the Planar, and the Unar. The term Zeiss Anastigmat thus gives way to appellations of a more particularsing nature. Besides treating of these lenses and their special qualies, the book before us affords the photographer a great deal of useful optical information. There are several tables of stop ratios on the English and Continental systems. Stops for half-tone work, reversing prisms, shutters, and tele-objectives are referred to in other sections of the catalogue, which is a production that is of direct interest to every lens user. Like everything leaving the great establishment at Jena, it is thoroughly well done, and is invaluable for purposes of reference.

News and Notes.

His Majesty the King and Her Majesty Queen Alexandra last week honoured Messrs. W. and D. Downey with sittings in their Robes of State at Marlborough House.

Therapeutic Action of Light.—Dr. P. Garnault has lately read a paper before the Académie des Sciences dealing with the therapeutic action of light, and mentions a number of cases in which he has used this treatment with success. His attention was first called to the subject by M. Trouvé, who was among the first to bring out this action of light; in 1893 he observed that a workman afflicted with rheumatism was completely cured after having remained for forty-eight hours in the vicinity of a very intense arc light used for an electric fountain. Since then it has been observed that in works where electric soldering is carried on, this being accompanied by great luminous intensity, the workmen cease to be affected with gout or rheumatism. In the present experiments Dr. Garnault uses apparatus which has been specially constructed for the purpose by M. Trouvé. The experiments were confined to the effects of local action of light, and there seems to be no doubt that the results are due to the light radiations and not to other causes. A lamp of 50 candle-power provided with a silvered parabolic reflector was applied in eight cases of muscular or articular rheumatism of average gravity and several years' standing, and in all these cases a very marked improvement was obtained at the end of three to twelve operations, and not followed by a relapse. Chronic catarrh of the nose may also be treated with success by the application of light accompanied by vibratory massage. The treatment was also applied in cases of deafness, accompanied or not by humming noises in the ear; the apparatus used consisted of two ten-volt lamps provided with reflectors and applied to each ear by a curved spring passing around the head; in some cases the action of heat was eliminated by placing alum screens in front of the lamps. In three such cases a marked diminution of the humming noises and an improvement of the hearing; other cases without the use of the alum screen were also successful. The most complete observation was made upon a person thirty years of age who had undergone, the year before, an operation in which the tympanum and small bones of one ear had been removed; on the operated side the intensity of the humming noises had been greatly reduced, but on the other they were very marked; these were made to disappear by a series of applications of light. They reappeared after a severe cold contracted by the patient, but were again made to disappear by a second treatment. In twelve cases of deafness the application of light brought about good results. Dr. Garnault has also used the treatment in other cases, and is convinced that the luminous rays may be used in certain affections as a local agent to great advantage, and that the results obtained are certainly due to its specific action.

A Camera Club for Malta.—Messrs. J. Mallia and Company, photographers, of the Grand Studio, Valletta, Malta, inform us that a camera club is in course of formation there. Its membership is to be confined to naval and military officers.

The T Club are arranging a sixteen days' tour to North Italy—including Florence, Venice, and other picturesque cities, they start on May 11. The expenses are not to exceed £14 14s. Any lady or gentleman desiring to join can have full details on application to the Hon. Secretary, Samuel Wells, Richmond, Yorks.

Royal Photographic Society Technical Meeting, March 19, at 8 p.m. at 66 Russell-square. Mr. Chas. B. Howdill, A.R.I.B.A., will read a paper upon "Photographing stained glass by the three-colour process." The exhibition of photographs, by Colonel J. Gale, remains on view daily from 10 to 4 (Wednesdays 10 to 8), on presentation of visiting card.

Mr. W. Milroy, of 20, St. James-street, Kingston, Glasgow, writes: "I have to inform you that a society has been formed under the name of the Glasgow Southern Photographic Association. At the inaugural meeting thirty-one members were enrolled. I shall be pleased to forward full particulars to photographers who may be interested on hearing from them."

We have grown to look upon the Derby Photographic Society's Calendar as an annual visitor. It reaches us this year somewhat late, but is none the less welcome. Bearing the names of the officers and committee; and lists of the summer and winter meetings as well as a calendar for the months, it is pictorially embellished by a photograph, entitled "Stour Floods," by Mrs. F. H. Gandy. This is a most admirable study by an accomplished lady photographer who has imparted to a winter flood view the utmost realism and feeling. We congratulate our Derby friends on the delightful production.

The Traill Taylor Memorial.—A meeting of the committee was held on Thursday evening, March 7. Mr. George Scamell occupied the chair, and the Hon. Secretary, Mr. P. Everitt, presented a statement of account showing the financial position of the fund to date. The fund at present amounts to £231 11s. 8d., and shows an increase of £7 8s. 10d. since November 14, 1899. Mr. R. Child Bayley having resigned from the committee and the other retiring members, decided by lot, being Messrs. A. Haddon, G. Watmough Webster, and H. Sturmey, it was resolved that Messrs. R. P. Drage and W. E. Dunmore be elected as town members, and Messrs. Thomas Bedding and H. Snowden Ward as country members. Mr. P. Everitt was re-elected as Hon. Secretary.

The New Coinage.—The accession of King Edward VII. to the throne necessitates the issue of a fresh coinage and new postage stamps. During the past few weeks many suggestions have appeared in the daily press as to the designs, and as to what the reverse of the coins should be. The coins issued in the Jubilee year 1887 were universally condemned, and those issued subsequently are not generally approved of. Photography made us all quite familiar with the likeness of the late Queen, and we all know how totally unlike her are the portraits that appear on all the coins, and on the postage stamps. We hear that designs for the dies for the new coins are in course of preparation, and it is to be hoped, when they are completed, that they will give more general satisfaction than the more recent issues of the late Queen's coinage. What, we imagine, most people would best appreciate on the new coins is a genuine life-like portrait of the King for the obverse at any rate. And the same may be said, perhaps with greater emphasis, with regard to the forthcoming postage stamps. Photography can supply them.

The New Star.—Last week we alluded to the new star in the constellation of Perseus in connexion with photography. At the meeting of the Royal Society on Thursday, March 7, Sir Norman Lockyer described the results of the observations at the Solar Physics Observatory, South Kensington, carried on since February 27. He said that during the week twenty-four additional photographs of it had been secured. This is certainly not bad for a London observatory at this season of the year. The photographs, he said, showed an especial brilliancy in certain bright lines of the spectrum indicative of hydrogen; in one case, also, a claret red colour had been observed, and also that these hydrogen lines were brighter on the blue side than they were on the red. Sir Norman also remarked that during the week changes had taken place in the spectrum, and amongst these was the disappearance of some dark lines and the appearance of others. He anticipated that as the new star cooled, the enhanced lines would disappear. Although the Observatory at South Kensington is not well situated as regards atmospheric conditions it is clear that, at times at least, valuable observations, photographic and otherwise, can be made there.

Amateur photographers in North London will be pleased to hear that a society has been formed to cater for their needs, under the name of The North-west London Amateur Photographic Society. The credit of originating the movement is due to Mr. Winkworth, who has been untiring in his endeavours to make it a success. All ladies and gentlemen who are interested in photography are cordially invited to join. The subscription is 5s. per annum. A large room has been secured at 65 Fortess-road, Kentish Town, N.W. A meeting was held on Wednesday last to elect the officers and to pass the rules; fifteen members were present and it is confidently expected that by the next meeting this number will be doubled. The election of a President was deferred, pending replies from those gentlemen who had been asked to fill the position. The following were elected: Vice-president, Mr. Toplis; Hon. Treasurer, Mr. Winkworth; Hon. Sec., Mr. Date, 271, Kentish Town-road, N.W.; Hon. Assist. Sec., Mr. Walker; Committee, Messrs. Beyer, Edgar,

Morgan, Reid, and Carter. The meetings are held every Thursday at eight p.m., the first taking place on Thursday, March 14, when Mr. Date will give some hints to beginners. During the summer, outings will be arranged both for Thursdays and Saturdays so that members may choose the day that fits in with their business engagements.

Commercial & Legal Intelligence.

MESSRS. C. A. Steinheil Fils, of Paris, inform us that their new address in that city is 50, Galerie Montpensier, and 30, Rue Montpensier, Palais Royal.

MESSRS. S. B. Bolas and Co., Architectural and Technical Photographers, write: "We have the pleasure to inform you that our lease of 77, Oxford-street, having been purchased by Messrs. Gill and Reigate, we have removed to larger and more convenient premises, 68, Oxford-street, right opposite our old address."

THE Kodak Dividend.—The Directors of Kodak, Limited, have declared Interim Dividends on the Preference and Ordinary Shares, at the rates of 6 per cent. and 10 per cent. per annum respectively, for the quarter ending March 31, 1901; which dividends will be payable on or after the 31st inst. They have further resolved that the transfer books be closed from the 13th to the 31st inst., both days inclusive.

CARBON Tissue.—The Woodbury Permanent Photographic Printing Co., of Great New-st., E. C., write: "We notice in your issue of the 8th inst., an enquiry from an amateur correspondent who finds a difficulty in obtaining sensitised carbon tissue. We fear it is this difficulty which is the cause of such a beautiful process being neglected by the amateur worker. We supply the tissue in small quantities, sensitised ready for use, and send it out in tins, thus ensuring its solubility. Any standard colours can be supplied, Bartolozzi red, sepia, engraving black, sea green, &c. Perhaps this information will be of interest to your readers."

THE Lumière North American Company, Limited.—This is the title of the latest photographic company whose prospectus is issued this week. The capital is £200,000, of which £30,000 are offered for subscription. Amongst the directors we note the name of Mr. E. Lewellin White, the managing director of Photochrom Limited, an able man of business and administrator, whose connection with the Lumière Company should inspire the greatest confidence. The prospectus before us states that the company has been formed for the purpose of acquiring from the Société Anonyme des Plaques et Papiers Photographiques A. Lumière et ses Fils, of Lyons, the right to manufacture and sell their plates in North America (including Mexico, U.S.A., and Canada), and also the sole agency for the sale of their products in Great Britain and Ireland. For further particulars we refer our readers to the complete prospectus which is published in our outer columns this week.

"THE Watkins Meters and Methods" is the title of a little pamphlet issued by the Watkins Meter Company, Hereford. The following extract indicates the scope of the pamphlet, which should be in the possession of all photographers who aim at correctly exposing and developing their plates: "We do not merely offer the 'bits of brass and glass' illustrated, but method and system—method which communicates to the beginner the expert's experience, system which makes photography exact. Exposure depends on three influences—Plate Speed, Light, Diaphragm. The plate speed is given on our speed card. The light is tested by the sensitive paper in the meter, the number of seconds required to darken to tint being noted. The diaphragm (or stop used on the lens) is marked by the optician. In the Watkins Meter a simple form of calculator estimates from these three influences the required exposure, and in the Watch and Standard patterns a chain pendulum aids in counting seconds."

CYANIDE Poisoning.—The "Herts Advertiser," of a recent date, gives particulars of an unfortunate case of cyanide poisoning, and its tragic results. A young and promising schoolmaster at Hatfield (Mr. Vincer) was in the habit of taking his mid-day meal in school, and for that purpose usually kept stout in his cupboard. He was a teacher of physics, and a close student of chemistry, and therefore had in his possession deadly poisons. Unfortunately, by the process of familiarity, he seems to have grown thoughtless with regard to the danger of the fluids in his possession, and had contracted the dangerous habit of putting poisons into the stoppered bottles which had contained stout, placing on them only a small circular white label about the size of a shilling piece. On the day of his death he picked up a bottle containing cyanide of silver and cyanide of potassium, and before he had discovered his mistake, swallowed a considerable dose. Fully aware of the terrible nature of this unconscious act, he picked up his hat and ran the full length of St. Peter's-street, past two doctors' residences and two chemists', in a wild effort to reach the chemist's establishment of Mr. Wells, in High-street. Staggering into the shop, he asked for an emetic, but before it could be administered, he had fallen unconscious, and died in a few minutes. The greatest dispatch had been exercised by everybody concerned. A smart boy at the school (Herbert Steel), accurately divining what had happened, followed the unfortunate man in his race for life, and was, apparently, able to acquaint those attending the victim of what had happened. Within the space of some five minutes, the patient had been drenched with an antidote by Mr. Wells, and two doctors had arrived, one with a stomach-pump, but death occurred within a few moments of the original fall, in the presence of a friend of the deceased, who was in the shop when the latter staggered in.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
18.....	Bradford Photo. Society	*The Making of a Picture.* Alex. Keighley
18.....	Camera Club	Discussion: *Panoramic Photography*
18.....	Derby	*A Chat on the Use of the Swing Back.* Mr. Keene.—*Short Demonstration on Toning.* Mr. Cusworth.—*Panoramic Photography.* The Secretary.
18.....	Doncaster	Prize Slides.
18.....	Glasgow and West of Scotland .	*Through the High Alps with a Camera.* T. W. Robertson.
19.....	Birmingham Photo. Society ..	Annual Dinner.
19.....	Gospel Oak	Annual General Meeting.
19.....	Croydon Microscopical	*A Journey round Kauchenjunga.* Mr. Garwood.
19.....	Newcastle-on-Tyne	Lantern Lecture. J. P. Gibson.
19	Rotherham	*Methods of Control in Photo Printing.* G. J. T. Walford.
20.....	Ashton-under-Lyne.....	Annual Meeting.
20.....	Borough Polytechnic	Lantern Night.
20.....	Croydon Camera Club	*Development of Platinotype for Warm Tones; also Crayons for Colouring Platinotypes.* W. H. Smith.
20.....	Derby	Excursion: Darley Fields. Leader, Mr. Dawson.
20.....	G.E.R. Mechanics Institution...	*Royal Meath and County Wicklow.* South London Photographic Society.
20.....	Southport	*Photo-Micrography.* Alfred Quayle.
20.....	Woodford	Lecture. H. W. Bennett, F.R.P.S.
21.....	Camera Club	*Yorkshire Caves and Waterfalls.* T. C. Hepworth.
21.....	Hull	*Architecture for the Camera.* J. R. Poyle, F.S.A.
21.....	Leigh	Demonstration: *Lantern-slide Making by Contact and Reduction.* W. Hampson.
21.....	Liverpool Amateur	Demonstration: *Carbon Printing and Development.* Fred Anyon.
21.....	London and Provincial	Lantern Night.
21.....	Manchester Amateur	*Exhibition of Negatives.* S. L. Coulthurst.
22.....	Aberdeen	*Ozotype Printing Process.* J. R. Roddick.
22.....	Croydon Microscopical	*A Practical Demonstration of Lantern-slide Making.* J. H. Baldock, F.C.S.
22.....	West London	*Photography in its relation to Art.* C. O. Murray.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 12,—Ordinary Meeting,—Major-General J. Waterhouse, I.S.C., in the chair.

GENERAL BUSINESS.

It was announced that the following societies had been admitted by the Council to affiliation with the Royal Photographic Society: Cripplegate Institute Photographic Society, Pietermaritzburg Camera Club.

The names of eight candidates for membership were read a first time, and a ballot for fourteen new members took place.

It was announced that Mr. John Sterry had been appointed by the Council a member of its body, in the place of Mr. J. J. Vezey, who found himself unable to accept office.

A letter from the Liverpool Amateur Photographic Society, with reference to a proposed memorial to the late Mr. H. P. Robinson, was read; and it was announced that the Society was prepared to receive any subscriptions that might be offered by the members in furtherance of the scheme, and to transmit same to the proper quarter.

The Chairman showed a curious case of

REVERSAL

sent to him by Mr. Wilson Noble. It was a gum-bichromate print, and the reversal had occurred as a result of excessive under-exposure, and not of over-exposure, as is generally the case. The Chairman could not recollect any similar case in his own experience with bichromate printing.

Mr. James A. Sinclair said that under-exposure in the Artigue process gave a grey flat image something like that shown, and where one should have got a white sky one got a grey sky.

Dr. Harting, of Germany, who was announced to read a paper upon

THE APOCHROMATIC COLLINEAR LENS

was present, but his paper being in the German language, Mr. J. H. Agar Baugh read a translation on his behalf. The paper referred to the problem of the correction of the secondary spectrum, or the remaining uncorrected colour of an ordinary achromatic telescope objective. The correction for the primary colours is usually obtained by the adoption of two lenses, a converging lens of small dispersion and a diverging lens of large dispersion, the well-known crown and flint glasses. In this way, until recently, correction for two colours and *two only* was possible. The precise colours of the spectrum which are to be brought together, naturally depend upon the purpose for which the instrument is required. The telescope objective should be chromatically corrected so that the rays which make the strongest impression upon the retina have the greatest attention. Fraunhofer was the first who dealt accurately with this problem, and later Seidel and Scheivner. The method of correction for this instrument is opposite to that required for a photographic objective. In order to concentrate the actinic rays as powerfully as possible, the blue-green Fraunhofer F line and the indigo-hydrogen line must be brought together. After further dealing with the advances that have been made in lens construction, the author of the paper came to a description of the lens before the meeting, which it was his hope reached a state nearer perfection than the instruments as yet available.

Having observed that the secondary spectrum in a system of lenses will disappear when the partial dispersions of all the glasses used are equal to one another, he goes on to consider how this is brought about in the apochromatic collinear, which is composed of two symmetrical halves, each formed of three cemented lenses. Comparing the figures of a table that was given, it was seen that the partial dispersions between C and D, and naturally also between D and F, were equal, meaning that, if the red rays are united with the light blue rays, they will also be united with the yellow and green rays. In the blue part of the spectrum, the second and third glasses possess the same partial dispersion between F and G, while the first one differs to the extent of five units of the third decimal point. Actual trials show that this small disproportion is of no consequence in the result. Thus in the intervals between F and G the colour correction is complete, as is proved by practical trials. The author assumes that the lens will be chiefly used in "process" work; he has therefore deemed it useless to give the lens a larger relative aperture than f-9, and it is on this aperture that the calculations are based. It is to be noted that the improvement of the lens in chromatic correction has also resulted in an improvement in the correction for spherical aberration. The apochromatic collinears are at present made in three sizes—16½, 23½, and 31½ inches focus. A reproduction of a copper engraving, measuring 18 inches by 14¼ inches, was shown as an example of its performances. It was taken with the 16½ inch lens stopped down to *f*-25. The example showed that the necessary fine definition required by such work could be obtained with such a lens; that there was no distortion and that the anastigmatic field of view was as large as the above figures. It is claimed that the lens will be of use in astro-photography, micro-photography, and three-colour work, but especially, as stated above, for process work.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 7,—Mr. A. Mackie in the chair.

Mr. J. W. Mayall passed round a number of cabinet prints to illustrate the regularity of result he had obtained with developed P. O. P. paper.

A discussion took place on the subject of developing P.O.P., but no information was forthcoming as to the method of developing these prints.

Mr. R. P. Drage asked if any method was known of developing P. O. P., which would result in a pleasing colour on simple fixing, so that the intermediate operation of toning might be dispensed with.

Mr. E. J. Wall had made a number of experiments. He had succeeded best with paramidophenol acidified with acetic acid. He had succeeded in obtaining prints of a brown tone, distinct from the usual foxy tone of a fixed but untoned print, but he had not been able to get anything like purple. He had also tried the gallic acid developer suggested by Warnerke.

Mr. Hodd had made many experiments since the demonstration he gave at the Association some time back. In answer to a question, he said he had not found a more successful process than that he had demonstrated. Referring to obtaining colours which would be satisfactory without toning, he said it was possible to get almost black tones, but the developers that would give this result were so energetic in action that they were not usable in practical work.

In answer to a question whether the accumulation of the silver salt in the developer after a number of prints had been developed made any difference in the result, Mr. Hodd said it did not. A precipitate of silver occurred on the print sometimes to the extent of almost obscuring it, but it could be sponged off, leaving no trace.

It having been stated that it was not all the brands of paper in the market that would develop by physical development:

Mr. S. H. Fry said that all that was required was to add a small quantity of a solution of nitrate of silver to the developer. This was corroborated by Mr. H. C. Rapson.

The Hon. Secretary, Mr. W. D. Welford, showed the working of the Doe portable electric lamp, as constructed for use in the dark room. He also distributed samples of the Thornton film.

Mr. Welford read a paper on "Society Demonstrations," in which, in a characteristically humorous way, he gave his experience of photographic societies and their ways gained as a trade demonstrator, and also of trade demonstrations and the ways of trade demonstrators, from the point of view of the Hon. Secretary of a Society.

PHOTOGRAPHIC CLUB.

March 6,—Mr. A. Mackie in the chair.

Attention was called to the nature of the evidence given by photographers in the recent criminal proceedings against the man Bennett, and considerable criticism was forthcoming, both of the action of the authorities in their choice of photographic experts in this and in other cases, and of the evidence itself. The greatest trend of the remarks was to favour a more careful selection of witnesses on whose evidence more reliance could be placed, in consideration of a wide experience which should be a characteristic of expert testimony of any sort.

Mr. E. W. Foxlee gave a brief outline of a process of bichromate printing, which was practically the Mariotype process applied to gum-bichromate. No carbon tissue is required, and there is no reversal as the picture is retained upon the original paper that was printed under the negative. Paper is prepared with a coating of gelatine in the first place, and then sensitised in bichromate of potash. It is then printed under a negative and, without previous washing, brushed over with a mixture of lampblack in gum, to which has been added a little acetic acid. The print so treated is allowed to dry, and is kept for say twenty-four hours, after which time it is floated on water, and the gum, in due course, is washed away. As regards a suggestion that transfer paper might be used in place of paper coated with gelatine as above, Mr. Foxlee said it was better to use a gelatine having in it no chrome alum. He did not think the chrome alum could be entirely washed out, and even so, the character of the gelatine would have been altered. Rough or smooth paper could, of course, be used, according to taste. Gum-bichromate was capable of yielding some very good results. If time were given to its peculiarities, and the whole process thoroughly worked out and mastered, there was no reason why good results in any number and of one quality and appearance should not be produced. He did not believe in uncertainty; no process was uncertain. It was rather a case of want of understanding.

Hackney Photographic Society.—March 5.—Annual General Meeting, Mr. E. Puttock presiding. The balance-sheet and council's report were satisfactory in all respects, and showed the Society to be in a very flourishing condition. The result of the election of officers and council for the incoming season was as follows: President, Mr. E. Farmer; Hon. Secretary, W. Selfe; Assistant Secretary, A. D. Fort; Treasurer, W. L. Barker; Curator, G. Parks; Lanternist, H. W. Dunkley; Excursion Secretary, S. C. Stean; Delegates to Affiliation R.P.S.—R. Beckett and W. Rawlings; Council—C. G. Burton, A. W. Cook, F. W. Gosling, W. Fenton-Jones, H. W. Lane, W. Rawlings, J. J. Westcott, L. S. Wilks.

North Middlesex Photographic Society.—March 11.—Mr. C. Beadle in the chair. Mr. J. MacIntosh gave a demonstration on "Ozotype." He pointed out the advantages over the ordinary carbon process, in that there was no reversed image, and that the image was visible during printing, and no safe edge was necessary. He gave the formula required, and described the process minutely. Prints by the inventor, Mr. Manley, were shown, and some of his own. A print was also developed successfully.

West London Photographic Society.— Mar. 9.—Mr. A. C. Beard, past president, gave a lecture on "A Cruise on a Man-of-War," illustrated by a large collection of lantern slides. The slides were shown by kind permission of the editor of the "King," for which paper Mr. Beard acted as special correspondent with the "B" fleet during the 1900 manœuvres.

Bath Photographic Society.—The Twelfth Annual General Meeting of this Society took place on Wednesday afternoon, February 27 last, when the report and statement of accounts were presented and adopted. The balance in hand, after defraying expenses, being £27 4s. 5d. The following gentlemen were elected to hold office during the year ensuing: President, Mr. G. Norman; Vice-Presidents, Colonel H. H. Sealy, Surgeon-Major Adcock; Committee, Mr. W. Pumphrey, Mr. Austin J. King, Mr. Geo. F. Powell (ex-Presidents); Colonel Blathwayt, Mr. W. P. Dickson, Mr. D. P. Williams, and Mr. Mowbray A. Green; Hon. Secretary and Treasurer, Mr. W. Middleton Ashman; Hon. Lanternist, Mr. J. W. Seaman.

Liverpool Amateur Photographic Association.—March 7.—Mr. Joseph Appleby gave a demonstration on "Platinotype Printing." The principal points evolved were absolute dryness in all operations prior to development, temperature of bath, and the use of glycerine as a controlling agent. The bath used by Mr. Appleby was a stock solution of oxalate potash 1 lb., water 64 ounces, diluted for use with an equal volume of water. A print was developed on a bath at a temperature of sixty-five degrees, the resulting print being of a cold black tone. The temperature of the bath was then raised to 150 degrees, and a second print developed, the tone in this case being of a warm black. He next proceeded to show his method of working with glycerine. Three soft brushes and the same number of small cups were required, the latter containing (a) glycerine, (b) half normal developer and half glycerine, and (c) normal solution. The print was first coated with glycerine, the medium being well brushed into the pores of the paper. The sky portion of the print was then painted over with the contents of (b), until fully developed; then blotted and again coated with glycerine. The foreground was next treated with the normal developer, detail in the high lights being brought up by the application of the stock solution. The fixing bath was hydrochloric acid one ounce, in eighty ounces of water, the print to be well brushed for a few seconds to ensure even fixation. A comparison between the finished print and a duplicate developed in the ordinary way showed a marked contrast in favour of the former. In responding to a vote of thanks, Mr. Appleby stated that he had found that the addition of two drachms of a five per cent. solution of chloride of gold, to twenty ounces developer, increased the contrast in the resulting print.

Southsea Amateur Photographic Society.—March 6. — There was a large attendance. Captain B. N. Buckley, R.E., gave a lecture on "Photography and Focal-plane Work in Australia." The lecturer is himself an Australian, and his pictures of life in the great towns of our great southern colony were most admirable. He is a keen horseman as well as a keen photographer, as his fine pictures (shown on the screen) of jumping horses and accidents taken at the big steeplechase meetings at Melbourne, Sydney, &c., proved. They were all taken with the focal-plane shutter working at about one thousandth of a second, and were splendid examples of instantaneous photography. Captain Buckley is a distinct acquisition to the Society, and he brought his subject right up to date with excellent pictures of the "Ophir," the Royal yacht in which the Duke and Duchess of Cornwall and York will visit Australia, and the launch of the "Kent" (taken that afternoon), which was christened with Australian wine.

FORTHCOMING EXHIBITIONS.

1901.

March 19, 20 ..... Brentford Photographic Society. Hon. Secretary, Hilton Grundy, Brentford, Middlesex.

Patent News.

THE following applications for Patents were made between February 25 and March 2, 1901:—

COLOUR PHOTOGRAPHY.—No. 3989. "A Method of Contact Printing in Colours directly from Transparent Coloured Positives, Photographic or other." EDWARD DOUGLAS FAWCETT.

PHOTOGRAPHIC PAPERS.—No. 3995. "Improvements in Photographic Papers, Films, and Plates for use in Rontgen or X-ray Photography." JAMES WILLIAM THOMAS CADETT.

FLASH-LIGHT APPARATUS.—No. 4000. "An Improved Smoke-and-dust Trapping Flash-light Photo Apparatus." JOSEPH HUBERT.

STEREOSCOPIC APPARATUS.—No. 4138. "Improvements in and relating to Stereoscopic, Scioptic, and Photographic Apparatus." JOHANN ZENKNER.

SHUTTERS.—No. 4146. "Improvements in Photographic Shutters." THE THORNTON-PICKARD MANUFACTURING COMPANY, LIMITED, and GEORGE ARTHUR PICKARD.

ANIMATED PHOTOGRAPHY.—No. 4161. "Improvements in Apparatus for Photographing and Exhibiting Animated or Ordinary Pictures." HENRY WILLIAM HAMBLIN PALMER.

BACKING PLATES.—No. 4168. "Improvements in Backing Photographic Plates and Films." GEORGE HERSCHELL.

VIGNETTING.—No. 4204. "A Method of Making, by Means of Printing and of Graphic Processes, Photographic Vignette-negatives on Paper in Replacement of the Expensive Vignette-negatives on Glass or on Celluloid as now used." HERMANN ERNST and LOUIS KRESLAWSKY.

PANORAMIC APPARATUS.—No. 4309. "Improvements in Panoramic Photographic Apparatus." Communicated by A. and L. Lumière. BENJAMIN JOSEPH BARNARD MILLS.

ROLLABLE FILM.—No. 4353. "The Separate Rollable Photo Film." CHARLES WALTER MCLAUGHLIN.

FLASH PHOTOGRAPHY.—No. 4388. "Improvements in Devices for Producing, by the Electric Volatilisation of Metal Wires, Flashes for Use in Photography." Complete specification. JULES COURTIER.

APPARATUS.—No. 4407. "Improvements in Photographic Apparatus." WILLIAM OSWALD STANLEY.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THREE FRAUDS.

To the EDITORS.

GENTLEMEN,—No. 1 fraud is A, who, being a tradesman, say, a draper or clerk, but to eke out a living, he caters for, and takes views and portraits of all he can grasp, and charges for the same. Yet he exhibits at obscure exhibitions as an amateur, and at times gets a prize as an amateur.

No. 2 fraud is B, who, either alone or as a company, advertises enlargements as crayon or "permanent" enlargements at 5s. or 6s., and it may be with the addition that others charge 20s. or 60s. for the same. Now, a person can sell goods or work at their own price, but to send out bromide as "permanent" is a fraud. Permanent is not such an ambiguous word that it can mean unfading for a few years. Permanent should be as an engraving or platinotype picture. For instance, margarine may be as good as cheap butter, but one is prosecuted if it is sold as butter. Therefore I would gladly contribute to prosecute some one who deceives the public with "permanent enlargements" which are not permanent.

No. 3 fraud is C, who dabbles for a while in photography, and is so puffed up with self-conceit that he must launch out and start a business after writing to THE BRITISH JOURNAL OF PHOTOGRAPHY inquiring all about how to construct his studio, colour of blinds, and sort of lenses, &c. Then he "blows his horn" for a time, but he cannot please the public, and he then collapses, or cuts down prices to the lowest. I had a good laugh at "Aspirant," who, some months ago, gave you his experience of two or three months, and then wanted a first-class situation, as he did not require to "go as an improver." Not he, poor fellow. I said "Aspirant" is not like the man who prayed, "Lord, give us a good conceit of ourselves." Any fool can now buy a camera and commence business and turn out work that I have seen in twelve months turn into the sere and yellow leaf. I wrote on this subject about two years ago. One writer highly approved of my letter, and another condemned it by drawing a parallel of the Pharmaceutical Society, but that missed the mark for this reason, that a chemist's assistant can serve his apprenticeship, and through time have practical experience enough to start a chemist's shop, and be equally as capable as the one who has "passed the exam.," but he dare not do so unless he has passed the examination. My sympathy there is with the practical hand without the "pass." My argument is that no one should be allowed to start a business or supply the public with photos who has not had a thorough practical knowledge of the business he is going into. That is imperative either in photography, chemistry, or anything else. That is required in any association if the status of photography is not to be trailed in the mire. Then neither manufacturers of soap nor tobacco could figure as photographers, and if they did hire a blackleg to do their work who had been trained, such could be known and marked. At the same time there will be "duffers" who will always flop in the mud like frogs, and never be capable of conducting a business, but continue in the cutting down processes. These would need to be either weeded out, or raised up in some way. I throw out these points for discussion, viz., that all who serve the public should be practical trained hands, and all these should be associated together. That no sham should deceive the public either by starting a business or giving bromides as permanent pictures, or any other deceit.—I am, yours, &c. PRO BONO PUBLICO.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In the interesting discussion which is raging between Messrs. Ives and Howard Farmer frequent mention has been made of Hübl's book, "Die Dreifarbenphotographie," and possibly therefore a precis of parts of the same may be useful as throwing some further light on the points at issue.

With regard, first, to three-colour sensation, Hübl points out that this was advanced by Young in 1807, and accepted by Helmholtz and Maxwell. It is generally known as the Young-Helmholtz theory, and is based upon the supposition of the retina being provided with three bundles of nerves, sensitive respectively to red, green, and violet. He also gives a diagram showing the curves of nerve excitations by the three fundamental colours, and says, further on, that the Young-Helmholtz hypothesis on the perception of colours has been repeatedly used as the starting point for the theory of trichromatic pictures, and for this reason it will be here treated of rather more fully. The three fundamental colours chosen by Young have been designated as the only correct ones for the coloration of the individual images, and the sensitiveness curves of the three nerve fibrils accepted as the necessary sensitiveness curves of the three photographic plates, but that a true reproduction of colours in the photochromoscope cannot be inferred from this theory, because we have no lights which correspond to the hypothetical fundamental colours, but it is accepted as rational for the starting point of trichromatic work.

With regard to Mr. Ives's theory, Hübl writes as follows:—"The theory of composite heliochromy set up by Ives in his patent of February 7, 1890, starts from the Young-Helmholtz theory of colour-sensation, which has been described as to its outlines on page 26. Young assumes three different nerve fibrils in the retina of the eye, which are red, yellow, and blue-violet sensitive. A certain red, green, or blue-violet light excites principally only one of these nerve fibrils, whence the three primary colour sensations, red, green, and blue-violet are caused. If two or all three nerve fibrils are simultaneously excited, there is formed the sensation of the intermediate colours. Thus, for instance, yellow is excited when the red and green sensitive fibres are equally strongly stimulated; if thus equal quantities of red and green light strike the eye; if the stimulation of the red sensitive nerve preponderates; if the mixture of light consists of more red than green, the sensation of orange is formed, and so on. The ratios of the excitation strengths which are requisite in order to produce the spectral colours find expression in the diagrams from Helmholtz, Maxwell, and others, which are founded on experiments with mixing spectrum colours. Ives strives to impart to the component pictures in the photochromoscope those colours which correspond to the primary sensations, and chooses for the photographic exposures plates whose sensitiveness corresponds to the curves of the said diagram. If the negatives are to be used for trichromatic printing, Ives requires as printing inks colours which shall correspond as far as possible with the fundamental sensations. The negative which represents the red sensation is therefore made on a photographic plate which is sensitive to the green curve of the diagram, and is to be printed with a colouring matter which only absorbs the primary green. The photographic plate should be therefore sensitive to all the rays of the spectrum, but especially to the green, and the colouring substance is a narrow banded pigment that obviously absorbs the green rays. One thus does not obtain that previously mentioned dependence between sensitiveness and printing ink, and when Ives actually denies such a relation, it can only be explained that he thus acknowledges one fundamental colour system, and raises Young's choice of colours to an axiom. If one assumes this standpoint, one has, surely, in the preparation of the negative, no longer any need to consider the fundamental colours, for these were

osen by Young, and the mixture curves corresponding to the same ere established by Maxwell or Helmholtz. Young's colours, however, belong to no theoretically correct fundamental system in the use of trichromatic photography (page 72), and the pigments chosen r Ives ('Photo. Corresp.' 1894, p. 400) for three-colour printing: erlin blue, eosine, or rhodamin red and yellow, stand, as a glance the colour sheet, supplement II., shows, in no connexion with ese colours. If one accepts Young's choice of colours, the said agrams form a theoretically narrowly correct basis for the spectroopic testing of plates, but these curves cannot be used in the actical work of photochromy. The curves given by Ives in the id patent specification differ considerably from those laid down by elmholtz ('Physiol. Optik,' p. 358), on the basis of his mixing xperiments with spectral lights. If one chooses to follow the tter, so must, for instance, the green in the photochromoscope con- in a considerable addition of red and blue, and the yellow in tri- romatic printing ought not to consist of the yellow pigment alone, ut must contain an addition of blue and red. In the photochromo- ope, then, only very whitish, and in trichromatic printing, only black- h shades would be formed. In order in the photochromoscope to btain at least individual parts of the picture sufficiently rich in colour, he whole contents of the colour triangle must be used, which in ne diagrams given by the author is the case. Moreover, these are ased on the not quite correct assumption that the spectrum is a ompressed line of mixtures." There are in the above extract everal references, but they require some considerable space for xplanation, and also some diagrams, and, as this letter has already xceeded normal limits, they had, with your permission, be better eft to another occasion.—I am, yours, &c., E. J. Wall.

Foots Cray, Kent.

THE SOUTH LONDON EXHIBITION.

To the Editors.

Gentlemen,—In your excellent notice of the South London Exhibition, you say, "G. Pinker. The last-named had a flagrant example of the misuse of the brush." But none of my prints were so treated. I think there must be some mistake in the name. If hand-painted photographs are to be exhibited, I consider they ought to be so described and classed by themselves.—I am, yours, &c.,

George Pinker.

62, Devonshire-road, Forest Hill, S.E., March 11, 1901.

THE LINE SYSTEM OF COLOUR-PHOTOGRAPHY.

To the Editors.

Gentlemen,—These columns are not the place wherein to discuss patent questions. Let me, therefore, merely refer in passing to Mr. Kenah's technical contentions.

I thought that I had made it clear that my devices are of the nature of "suggestions" and not of statements of fully completed results. Nevertheless, they rest largely on experimentally validated data. The working combination of these data in practice is what I shall soon hope to test.

I have no bias against the "McDonough" system, beyond thinking that it is, perhaps, a needlessly complicated form of application of du Hauron's line theory. From a commercial point of view it will probably be very successful. It is easy to work, and reliable also, for the amateur who is not too exacting as to ideal reproductions of colour luminosities and gradations. It will provide the public and travellers with extremely interesting records (and most photographs are only wanted to subserve this end). But it has, of course, its obvious limitations. I have seen the set of transparencies on view at the "Royal" last year, and also a variety of effective work very courteously shown me by Messrs. Tripp and Crewdson, in London recently. One portrait was especially excellent, though in no case were the renderings of hues and values at all equal to the best results seen in the Kromskop of Ives' and in Sanger Shepherd's transparencies. The "prints," of which I saw very few, were not good and, indeed, most critics who have seen these prints notice a marked degradation of the colours which it is sought to reproduce. It is not, I take it, possible to obviate this degradation. The transparencies offer obviously by far the best results obtained by the process, and some are certainly very effective. I must repeat, however, that even the best results suffer severely from the variation in the colouring as experienced from different points of view, e.g., only yesterday at the office of the Colour Photograph Company, I was shown a good specimen of a portrait (in which the whites, if not very luminous, were well rendered), of a lady; the transparency being placed in a window. A very slight change in the position of my eyes altered the colour of her dress in a most bewildering fashion: no one, indeed, seated in my chair could say with certainty what the colour of the dress actually was, so strange were the coruscations! Landscapes, also, suffer severely. Lack of due registration, as complained of in my article, is, of course, the cause. That there are certain advantages in the McDonough process is obvious (when easily made copies are wanted, &c.), but for single pictures I should prefer infinitely a positive made according to the single-plate method which I have indicated.

Using the latter method, economy suggests protecting the lines so that "waster" films can be washed off at need.

Fine lining is urgent. A scale of 250 lines to the inch is useless for good lantern work; I have never shown a Joly slide with satisfaction to my friends, owing to the obtrusiveness of the lines. Yet the Joly screens, which gave such doleful results, were ruled nearly as closely as are the new screens (300 to the inch). Mr. Crewdson tells me that it will now be possible to rule 1500 to the inch: a result for which we must pay a high tribute to the enterprise and ability of Mr. Tripp and his zealous co-workers. Expense, of course, should be no object if one wants the best results. My suggestion is that the one plate method should be subjected to exhaustive experimentation, using the 1500 or even the 500 ruling. Of course we cannot expect to get results like Lippmann's or Ives' wherewith to gladden our hearts, but it may be possible to obtain some very nice records, which, after all, are quite adequate to the general amateur workers' needs.

Let me say in conclusion—for I do not propose to carry this discussion further—that we shall probably all agree in admiring the enterprise and labour expended by our American friends in perfecting the mechanical side of the "McDonough" process. The "chromatic balance" shutter is also a capital piece of work, and suitable for general photographic use. With cordial hopes that their work will result in something of great use to the amateur.—I am, yours, &c.,

E. Douglas Fawcett.

SUNBEAMS THROUGH THE CLOUDS.

To the Editors.

Gentlemen,—Thanks for your proffered aid regarding a new organization of photographers, for the moment is opportune, and will doubtless bring forward a few clear-headed men and women willing and ready to act for the general good of their calling. Spirited Aberdeen points the way, and if every town of any importance would follow suit, the profession would soon have its rights defined and its property upheld. Such a plan, in the first blush, seems the simplest of attainment: preliminary work accomplished, delegates could be deputed to attend a central conference. Then, perhaps, the meetings of the Photographic Convention could be utilised in a way to strengthen the honour and dignity of an organization of photographic brethren, as well as to take into consideration the just claims of the art of photography.

It is surely to be deplored that you, Mr. Editor, should "advise the abandonment of legislative protection." What! an art appreciated and acknowledged by the highest and best-educated peoples of the world not seek the consideration and aid of legislative wisdom? Impossible! The position must be our goal.—I am, yours, &c.,

52, Comiston-road, Edinburgh. John Patrick.

THE PROPOSED PROFESSIONAL ASSOCIATION.

To the Editors.

Gentlemen,—Re your desire to know the wish of professionals in connexion with the formation of a protective association against foreign invasion of our rights, I beg to say I am distinctly in favour of a National Association rather than local assemblies, on the ground that with a national association greater pressure could be brought on the firms who supply the material for illicit use, which is the only way that I can see that any good can be done.

I agree with you that amending copyright law is practically nonsense. We must make manufacturers afraid to supply outsiders except for genuine advertising purposes. You see, with local administrations, isolated professionals like myself would be left out in the cold, and also there would sure to be black sheep among local professionals who would act shadily to grab a few extra orders that others refused.

In event of any steps being taken to form a national body for mutual protection, I should gladly enrol myself, as I trust every photographer worth the name would also do. Then, and then only, should we be able to put our foot down and say, "Thus far shalt thou go and no farther."

Of course, as "Old 'Un" says in your last issue, we might fight them on their own ground (the cigarette and soap firms) by also issuing cheap work, but this I strongly object to, as I consider offering tea, soap, &c., with photographs decidedly beneath the dignity of a true photographer, and a practice tending to bring the profession into even greater contempt than at present, and, personally, I would rather sell out and quit business than do so.—I am, yours, &c.,

March 9, 1901. Othello.

RE "BUBBLE AND SMOKE" PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—Perhaps this coined designation is full of prophetic meanings. Nothing appears to be sacred to the avaricious devotees of Mammon, whose only text is "Get money." I should imagine that, to this end, they almost sighed for an advertisement on Queen Victoria's coffin. Oh! for the pen of a Ruskin or a Carlyle, for their doings are beyond the pale of ordinary reasoning. Satire seems to be the most penetrating shaft for their callousness, and herein your correspondent, "An All-Alive Old 'Un," has done well, and even our old friend "Ally Sloper" has a keen dig at them occasionally. But amid all the panderings to the baser side of humanity with which the press of to-day teems, viz., covetousness (which trait, perhaps, is the mainspring of all trade, and only a vice like many more things when inordinate) this point is missed: Why do all these articles require such bribes to ensure sale? Cannot they rely on their own merits? It appears not. Another fact is this: Let these voracious combines alone, and they eventually gobble each other up (and herein lies, I think, true Spencerian philosophy). Example: These latest gambles, having gone one better, cut the ground clean from under the feet of all the other preceding efforts in the same direction, whatever paper, magazine, or article has sought the support of such props, and causing a big percentage of the capital advertising such, to be so much waste. Thus first one firm and then another goes "forging ahead."—I am, yours, &c., W. BARRY.

The Studios, 7 and 8, Park-street, Hull, March 9, 1901.

THE OGDEN-LEVER PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—In reading the correspondence contained in the recent issues of your paper re the "smoke and bubbles photographs," I have failed to see any mention of what these much-talked-of photographs really are. As I write I have one of these before me, and it may surprise many of your readers, as it did myself when I examined one of these permanent cabinet photographs. It is nothing more nor less than a carte-de-visite bromide print mounted on a cabinet mount with a plate-sunk centre. How this constitutes a permanent cabinet photograph, I for one fail to see. On the face of it, both Messrs. Smoke and Bubbles' advertisements contain two most glaring misrepresentations—first, as to a bromide print being permanent, and, secondly, by calling a carte-de-visite mounted on a cabinet mount a cabinet photograph, and my humble advice to the members of the profession is to each obtain a specimen of these photographs, which they can do for three stamps, and then if customers bring forward the statement of being able to obtain cabinet photographs at 2s. 6d. per dozen, it would be a poor receptionist or operator who, possessing one of the photographs under discussion, and being able to compare it with their own productions, would not be able to convince a client that they would not get the class or size of picture represented in the advertisement. Also another point is as regards my own experience with the general class of pictures, tintype and glass included, which are brought by customers to be copied, is that they are totally unsuited to be printed on bromide paper, and this could also be impressed on the public. Another aspect of the question that has come under my notice this week is Lever Brothers offer for twelve wrappers off their soap and 2s. 6d., to supply a 12×10 permanent picture, mounted on a mount 15×18. Not having seen one of these, I cannot offer any suggestion how to combat it, but can only give vent to a long-drawn sigh for the poor, poor photographer.—I am, yours, &c., SPHINX.

Liverpool, March 9, 1901.

To the EDITORS.

GENTLEMEN,—I have read the letters in your estimable JOURNAL on the above subject, and also your summing up of the various suggestions offered by your correspondents, as to the remedies to be adopted to meet the present deplorable state of things in the profession. The apathy that has hitherto existed ought to be done away with at once and for evermore, and all true artistic photographers that have the best interests of photography at heart should at once take to your suggestion and give in their names in hundreds and thousands, and to start once again a National Association of Professional Photographers, to consider all questions of photographic interest, and to endeavour to protect ourselves from these heartless aggressors, these dividend-earning companies, who invade the photographers' domain, and thus prevent, or endeavour to prevent, a hard-working and generally cultivated body of men from getting their living. This is quite enough to raise to active energy any dormant spirit there is amongst us, and cause us to combine to crush such attempts as this to do injury to the photographers of Great Britain and Ireland.

Photographers, as a body, have too long held aloof from all combination for their own benefit, and have in many instances adopted a policy of cutting each other's throats instead. Now, as this policy has up till now resulted in no good, let photographers try your suggestion and organize themselves for their own protection. Broadly speaking, the general public are usually willing to pay a reasonable and proper price for any article whatever it may be, but these money-grabbing companies that are everlastingly offering something cheap, and cheaper, and yet cheaper still, cause a great deal of undesirable competition, and make photographic existence for a good many photographers a tremendous struggle and tussle.

There seems every encouragement to photographers to combine for mutual interest and good at the present time. Look at the good the Chambers of Commerce are able to do all over the country in getting freight charges put right, more convenient train services, and also in bringing pressure to bear on members of Parliament when Bills come on which affect the interests of their own town and industries. Look at the rise in workmen's wages through the combined action of trades unions generally. Look at the victory of the people over the "Daily Telegraph" and "Daily Mail" Sunday newspaper question. Look how the attempt to open the Crystal Palace on Sundays was set aside, and, lastly, look at the decided victory of the working people on the London County Council election just polled for on the housing and water question. Now, all these victories were achieved by combined concerted action of people who know what they want and how to get it, and so if this association of photographers comes to be a practical thing, out of it may also rise a co-operative plate and paper factory, that would assuredly do a big business amongst professionals only. We are, I trust, perfectly willing to "live and let live," but not at all willing to "grin and bear it," and play the part of a "toad under a harrow," to please people of the Ogden and Lever brand. If photographers generally will rise to this occasion, something will be done that is worth the doing. This seems very important, and unless we take this matter up with spirit and determination, this profession as a lucrative one, and as a life work and a living for our sons and daughters, is doomed. It simply will not be worth following in another fifteen or twenty years if photographers let things slide as they are doing at present. What with the arbitrary dictation of the Plate-makers' Association, and driving the sales of photographic materials into the hands of the chemists, the mount-makers' rise in prices at a moment's notice, the ubiquitous amateur that has robbed us of some phases of outdoor work, the evening newspaper enlargements at 6s. 6d. each, and now, to cap all, photographs given away with packets of cigarettes and bars of soap. Now, the Editor thinks that this can be altered, and that it lies with photographers themselves to do it. I for one will join the society if formed, and if it is taken up heartily will send in a donation of three guineas towards the initial expenses of formation. Now do take the Editor's advice and organize yourselves, and thus secure the powerful advocacy of THE BRITISH JOURNAL OF PHOTOGRAPHY, and perhaps, as is often the case, "out of evil will come good."—I am, yours, &c., A LONDON PROFESSIONAL.

RE COUPON PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Since writing you on the above subject, we have received a reply to our letter to Messrs. Lever Bros., and enclose you herewith a copy of same and our reply, which leads us to hope that they, at least, will give their productions a more truthful description in the future.—We are, yours, &c., pro Newton and Co.,

H. W. NEWTON.

19 and 21, Fife-road, Kingston, S.W., March 6, 1901.

(Copy of Letter from Messrs. Lever Brothers.)

"Lever Brothers, Ltd.

"PHOTOGRAPHS.

"Dear Sirs,—We are obliged by your letter of the 4th inst., and note your remarks on the above subject. We can assure you that our efforts will be to fairly represent these reproductions; and, with regard to the question generally, our idea is that it will stimulate the local demand, as senders must enclose their own photograph before they can obtain an enlargement.—Yours faithfully,

"Lever Brothers, Ltd.,
"W. HARVEY, Managing Director.

"Messrs. Newton and Co., 19 and 21, Fife-road, Kingston, S.W.
"March 5, 1901."

(Copy of our Reply to Messrs. Lever Brothers.)

"Messrs. Lever Brothers, Ltd.

"PHOTOGRAPHS.

"Dear Sirs,—We beg to acknowledge with thanks your letter in reply to ours of the 4th on the above subject; and are pleased to gather

rom same that any unintentional misrepresentation of your photo-raphic reproductions will be fairly represented in the future. As we tated before, this is the only part of your system that we feel entitled o protest against; as, though we cannot agree with your views of it timulating local trade, we know how to deal with this sort of com-petition when it crosses our path.—Yours faithfully,

"pro Newton and Co.,
"H. W. NEWTON.

"19 and 21, Fife-road, Kingston, S.W., March 6, 1901."

RE COUPONS AND CASH FOR PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—The unstinted commendation of Messrs. Odgen's scheme, appearing in your issue of February 15, must have been perused with pleasurable avidity by the body of photographers throughout the country.

The feeling prevalent in interested quarters that this scheme will ultimately benefit the photographer is, to say the least, a misnomer. We are confident in our belief that no greater blow has been aimed at the best interests of the trade than this peculiarly "gilded" form of blacklegging.

Commend the commercial enterprise of Messrs. Ogden's as you may, but it is surely your first duty to safeguard the interests of the trade your paper represents. Instead of pursuing such an obvious course, you place into the hands of the firm in question their strongest weapon of defence, as instanced by their reply to the letter of Messrs. Newman, Mayall, and Co., quoted in your issue of March 1.—We are, yours, &c., EVERATT AND CO.

Kensington Studio, Ocean-road, South Shields, March 5, 1901.

To the EDITORS.

GENTLEMEN,—While it would seem that professional photographers generally have a legitimate cause of complaint against certain large manufacturers who, in the course of their business, combine tobacco and soap with photography, yet, to me, this mixture seems no more incongruous and distasteful than that dispensed by one of the first photographic firms, who, at their Regent-street branch, combine the businesses of photographers and portrait painters with that of cycle and cycle accessory dealers.

While, to the uninitiated, there may seem a connexion between oil paintings and cycling oils, yet I am surprised that a journal of your value and reputation should so notice the faults of the other side, while the evil is so prominent on your own. I enclose card, but prefer to remain, yours, &c., FAIR PLAY ON ALL SIDES.

March 11, 1901.

To the EDITORS.

GENTLEMEN,—Re the vexed question of photographs by big combines as bribes to buy their articles. These combines not being amenable to the feelings of others, and legislation being slow, cumbersome, and enormously costly, let the photographers try retaliation in kind. Here is a scheme, perhaps Utopian, but it would have effect. Let all the photographers in the country combine (now a very numerous army) for a time to execute and give photographs gratis to any person bringing to the studio wrappers of an article manufactured and sold by a rival firm in the same line as the offending firm.—I am, yours, &c., IXION.

March 11, 1901.

To the EDITORS.

GENTLEMEN,—The correspondence anent the Ogden-Lever competition is satisfactory in showing that photographers are alive to the danger threatening their trade, but it is useless as preventing their opposition. It is now too late, and photographers are such a small body altogether that it is useless to hope for any likelihood of these firms discontinuing their present advertising methods. And the likelihood of others following is certain; indeed, I had a call to-day from a cigarette manufacturer who intends enclosing coupons in penny packets of cigarettes entitling the purchaser to half a dozen cabinet photos on collecting three hundred of these coupons, and wished to get the names of photographers who would take photos of those collecting the coupons, and they would pay 2s. 6d. for each half-dozen cabinets. This is the price a well-known firm in the city did the same arrangement for a coffee manufacturer a few years ago. It, however, did not succeed, as they did not advertise so much as the present arrangement is being boomed. I notice most of your correspondents are of the opinion that the Lever-Ogden photos are cabinets, but this is not so; they are C.-de-V. mounted on a rough card cabinet size. Their latest offer of a 12×10 enlargement mounted on 18×15 mount is even a greater blow to photographers than the other.

It is not, however, the firms advertising publicly that photographers have to dread so much as the insidious methods of the amateur, and nowhere has this been felt so much as in Glasgow. Some time ago having to photo some houses for a builder in one of our suburbs, he suggested that proofs be also sent to the owners, as they would be likely to have some. This was done, with the result that in several instances they were returned with the information that a gentleman intended taking their villas at a much smaller charge, the gentleman in this case being one of our prominent bailies. I have also in mind a manufacturer who makes enlargements for his customers, and one of whom had the effrontery to ask for a loan of his negative so that this manufacturer might enlarge it for him with the apparatus and all necessary appliances provided by the Amateur Society. These instances might be multiplied, and many given where, of course, only the cost of material was made, but, cui bono, we have allowed them and the dealers to do as they would in the past, with the result that no effort on our part will stem the utter extinction of professional photographers in the near future. It is clear that only a few of those devoting their attention to upper classes will survive. See, as an example, how the illustrated papers are full of snapshots, and how few comparatively professional photographers' pictures appear.

The only method to overcome the present opposition, so far as I see, is for photographers all over the kingdom to do a C-de-V. mounted on cabinet card, similar to the Ogden-Lever arrangement, at the same price, without the need of gathering coupons for same, and to get the large companies, such as Morgan and Kidd and Woodburytype Co., &c., to make representations to the L. and O. and any others offering enlargements at such ridiculous prices, and a refusal to purchase by photographers from any bromide paper firms who may supply these soap and tobacco firms with material for their printing and enlarging.

Regarding the danger run by the firms doing this coupon business in infringing copyright, this is nil. Even with a picture that has apparently gone through all the formalities necessary, it would be impossible even for the Copyright Union to fight such firms in the Law Courts, and they would eventually have to give up, with a bill of costs to pay that would overwhelm the Copyright Union or any photographer bringing an action. Copyright in a photo is a bogey that can only be used to frighten people with small means. The fact that the illustrated papers pay is not because they think the case good, but so that they can get their papers filled, and it is better to pay a few shillings and be certain of an unlimited supply than fight and cut off this supply. Indeed, it is my contention that the copyright of a photo can only belong to the party photographed, and he cannot sign away his right, even if he would, and it is only he who can bring an action with any likelihood of success.—I am, yours, &c., ST. MUNGO.

Glasgow, March 9, 1901.

To the EDITORS.

GENTLEMEN,—With reference to the correspondence in your columns recently directed against Messrs. Ogden and Co. and others for introducing photography as a means of advertising their manufactures, certainly this is unfortunate from the standpoint of any professional photographer, and it is certainly very difficult to see how it is to be stopped. There have been several suggestions, which you have classified in your last issue, but take the proposed amendment of the Copyright Bill. Can any of your readers think it at all likely that Parliament would pass a Bill with any such clause as is suggested, viz., to prevent a sitter who pays for his photograph in the ordinary way from getting it copied or reproduced wherever or in whatever form he wishes? Of course, if Messrs. Ogden or Messrs. Lever, or in fact anybody else, infringe any copyright right of individual owners without permission, then the present law can be brought against them. Then, as regards photographers' protection associations. Is this possible? Will half, or even a third, of the professional photographers of the United Kingdom combine, supposing any workable scheme was arrived at for the prevention of this advertising of goods?

I will not refer to associations that have existed and passed away, such as the N.A.P.P. and the Benevolent Association, but take one of those in existence now—the Photographic Copyright Union. Is this supported by photographers as it should be? According to your valuable JOURNAL some little time back, and taking the attendances at the annual meeting of members, it is not. Of course, one does not expect all photographers to have copyright photographs which need protection, several probably do not get one copyright photograph per year, but do the majority support their brother photographers by subscribing to the funds of the P.C.U.? I think not, otherwise the Committee of that Association would not have to appeal as they have done for monetary support to watch and appear against the Copyright (Artistic) Bills that have made their appearance during the last few years. I wonder what sort of an Artistic Copyright Bill we should

have had, supposing it had been left to the artists of St. John's Wood, and had several members and the solicitor of the P.C.U. and also representatives of the R.P.S. not appeared and offered evidence before the Selcet Committee of the House of Lords last year? I remember reading in your columns about the "iniquitous Bill" as it was originally drawn up by the artists.

Then, again, one of your correspondents writes very strongly against the Plate and Paper-makers' Association. Was it not the cry of some photographers before the formation of this Association that amateur photographers could buy their plates and paper at the same price as they themselves had to pay? This has been, to a very great extent, stopped, and now the complaint is that "the plate-makers dictate to us their own terms."

But to return to the main question. In my humble opinion, I think Messrs. Newton and Co. and some other of the correspondents are in the right groove, that is to represent direct to the firms in question the injury their action may do to the profession in competing unfairly in this matter; and I believe if this was represented in a proper way by an influential committee of professional photographers (if it be possible to form such a committee), it would have the desired effect, at least it is worth trying for. At any rate it would be far more dignified than the threat to boycott the wares of the offending manufacturers. Apologising for taking up so much of your valuable space.—I am, yours, &c.,

AN INTERESTED READER OF YOUR VALUABLE JOURNAL.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

R. Espley, 35 Liverpool-road, Eccles, near Manchester.—*Photograph of Six Volunteers for S. Africa.*

L. & R. G. Berry, Excelsior Studio, Chapel-street, Chorley, Lancs.—*Photograph of Reading the Royal Proclamation of King Edward VII.*

A. B.—You may rely upon it that your trouble is not due to the silver, or the gelatine you have tried. In all probability you have used dirty vessels for the work, or have not been careful in the manipulations.

DARK CHLORIDE OF GOLD.—"CONRAD" asks: "Will you please inform me (1) what is meant by dark chloride of gold? (2) By whom it is manufactured?"—In reply: (1) Dark chloride of gold is more used in Germany than it is in this country. It is said to contain a larger proportion of gold and less acid than the usual commercial article. (2) It may doubtless be obtained from such firms as Hopkin & Williams, or Messrs. Fuerst Bros.

AN OPINION.—"FRA" writes: "I am sending a few specimens of my own operating and retouching, and would like you to give me your candid opinion regarding same, whether you would call the work really first class, or only second or third class, both the operating and the retouching."—In reply: As our friend asks for a candid opinion we give it. We should class his work as of the third-rate commercial order.

DEVELOPING TRAYS.—F. E. J. asks: "Would the ordinary baking tins, coated inside with some enamel, such as Aspinall's, or the enamelled pie or meat dishes sold at ironmongers, serve the purpose of developing or fixing bromide enlargements in?"—Yes, provided the metal is perfectly protected by the enamel. The latter, on account of their greater rigidity, would be the preferable. Unless the metal is perfectly protected neither kind is suitable.

A LENS QUERY.—Q. E. D. writes: "Please let me know the best kind of lens to get for photographing groups of persons and animals in a studio."—The best lens for groups in the studio would be either a "group lens" or one of the anastigmatic type working at about *f*-6, and for animals a quick-acting portrait lens, such as are intended for cabinet and similar portraits. These require much less exposure than the former type, though they are not so well adapted for groups.

ENAMELLING P.O.P.—G. F. asks how to enamel P.O.P. on glass and the best way to mount them without showing the paste round underneath the prints.—In reply: This query is not quite clear; but we presume you wish to preserve the gloss on prints that have been squeegeed on to glass in the mounting. If that is so, back them up, while wet, with the special paper sold for the purpose at the photographic warehouses. Then the prints can be mounted on the mounts in the ordinary way.

OPTICAL CONTACT.—J. J. SMITH writes: "Will you kindly inform me how paper is placed in optical contact with glass for opalines, and the best medium for the purpose; if gelatine is used or any special article be used, and if applied in a liquid, or only a damp surface is used for the purpose?"—Gelatine is the mountant generally employed. Place the glass and the print together in a weak, warm solution of gelatine, remove—avoiding air bubbles—and squeegee together. The gelatine solution will, of course, be liquid.

COPYRIGHT INFRINGEMENT.—A. B. C. writes: "I have just found that a New Zealand paper has published a copyright picture of mine, which is of sufficient value to have been published four times already, within eight months. Would you kindly do me the favour of telling me how to proceed, to enforce payment for the infringement?"—We are inclined to doubt if you can *enforce* any payment at all. We should advise you to communicate with the Secretary of the Photographers' Copyright Union, London Chamber of Commerce, Eastcheap, E.C.

RETOUCHING LESSONS BY POST.—RETOUCHER writes: "I notice in your issue of March 1, a communication from Mr. T. S. Bruce re retouching lessons by post; for the benefit of the correspondent of a few weeks ago, and others who may desire like information, I beg to enclose a few prints, &c., done by me during the course of six lessons. Perhaps, you, Mr. Editor, will be good enough to comment on them, and to give an opinion as to the efficacy of postal lessons."—In reply: We congratulate both tutor and pupil. The specimens of work sent are very good indeed, and do the greatest credit to Mr. Bruce's method of teaching by post.

THE CRYSTOLEUM PROCESS.—"CRYSTO" writes: "Will you kindly inform me, and oblige, what is the proper paper on which to make prints for crystoleum painting, also where I can buy the same, also where can I obtain glasses for crystoleum painting? I have been told that the glasses are made in England. Can you tell me where?"—Albumen paper is what is usually employed for crystoleum, and it may be had from all photographic dealers. Crystoleum pictures are somewhat out of date now, but we surmise the glasses may still be had at such houses as Marion's, Houghton's, and the like.

STUDIO BUILDING.—H. JARMAN writes: "I am about to convert a room into a studio. It is situated about four feet from a very high building of light stone colour. The sun shines on this nearly all day. Do you think it would be likely to affect the lighting in a very marked degree? Would twelve feet length and eight feet breadth of top light be sufficient, together with what side light could be obtained?"—In reply: With such a studio, of course, all the side light you would get would be such as is reflected only from the wall, and that would not be much. We do not see, with such a narrow studio, that more than twelve feet of top light would be of any great advantage. If you could light from the other side it would be better.

A WAGES QUESTION.—"AMATEUR" writes: "I wish to get a situation as general assistant, or something of that kind, at a professional photographer's. My only experience in photography is as an amateur, but am able to do first-class work, in copying and enlarging, printing P.O.P., plat., and carbon, and thorough knowledge of general photography. Kindly tell me what wages you consider I ought to expect?"—The wages you can obtain will, of course, depend entirely upon your ability in the work, and of that we cannot judge. You must keep in mind that working as an amateur is very different to fulfilling an engagement in professional photography, where failures are not expected by the employer. Better advertise your requirements and then submit examples of your work.

LEARNING OF PHOTOGRAPHY AS A BUSINESS.—S. H. G. writes: "My son, just leaving school, has a fancy for photography, and I have decided to put him to the business, hoping that some day I may be able to give him a start for himself, when at same time it may not be too late for me to assist him when such need of assistance arises. I am, however, anxious to go the right way about it without wasting too much time, and beg the favour of your opinion. I would not mind paying something, but could not pay a large premium—at same time prefer to pay something rather than a lot of time should be wasted in his being made errand-boy and general servant. Perhaps the classes at the Polytechnic would be too advanced for him until he had had some working experience to enable him to grasp and understand the technicalities."—We should advise you to article the lad to a good photographer, if you desire him to follow photography as a business. It would then be advantageous to him to attend the classes to learn something of the theory of the different processes with which he has to deal.

HALF-TONE WORK.—"PHOTO-BLOCK" writes: "(1) I am a semi-professional photographer and add to my income by the work. If I could produce 'Photo-blocks' for ordinary printing purposes (type-high for printers), they would be very saleable. What is the process called and (if more than one) the best? Also can I get a fairly cheap and good work on the subject? I mean a thorough treatise and where published, &c. I am altogether in the dark on subject. (2) Also can I use an ordinary wide-angle photo lens for the production of stamp photographs by the insertion before or behind the lens of an arrangement, for multiplying the copy (always a photograph)? This to save buying a new apparatus. I do not mind a little extra work to save extra expense, and, if so, where purchasable?"—(1) Better obtain Verfasser's work on the subject. It may be had from Messrs. Dawbarn & Ward, Farringdon-avenue, or Messrs. Penrose, Upper Baker-street, W.C. That will give you all information. (2) The best way will be to fit a repeating back to the camera to take as many portraits on the plate as you desire. Or you can purchase cameras specially constructed for the purpose.

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EX CATHEDRÂ.

The Proposed Professional Association.

In compliance with the wishes of our professional readers in all parts of Great Britain and Ireland, as expressed in our pages this week, and for several weeks past, we take pleasure in announcing that we have made arrangements for the holding of a meeting to consider the desirability of forming an Association of Professional Photographers, for the purposes of mutual interest and protection. The meeting will be held on Thursday evening, March 28, at 8 o'clock, in the Chapter Room of Anderton's Hotel, Fleet-street, London, E.C. A clear week's notice is thus before our professional friends, who, we trust, will attend in great numbers, not only from London but from the country. Anderton's Hotel, which has been the scene of numerous important photographic meetings for many years past, has been chosen for its central situation, and as being the most generally convenient of access. The Chapter Room, in which the meeting will be held, accommodates a great number of persons. This notice is issued to professional photographers and to professional photographers only, and the invitation to them to attend the meeting on Thursday, March 28, is given in redemption of our pledge of a fortnight ago, that "if we could discern a strong and sincere demand for a professional organization, we would take steps to facilitate its formation." Elsewhere, in this week's Journal, the matter is again dealt with by numerous correspondents and ourselves: the particular object of this paragraph on our first page is to draw attention to next Thursday's meeting, and to invite the attendance of all professional photographers.

* * *

The Waning New Star.

When first drawing our readers' attention to the new star, we pointed out the probability of those who desired photographic records of it having little time to spare, and already our vaticinations are being fulfilled, for the star which has been the great astronomical topic for the last two or three weeks, is already on the wane, and its conspicuous visual brightness a thing of the past, though photographically it still gives a strong image. A great change has taken place in the spectrum photographs obtained, Sir Norman Lockyer in one week having made two dozen spectrum negatives, and it is being still photographically watched to obtain further similar records, which it is anticipated will gradually undergo a continued change. Sir Norman found a similar class of results in the spectra of two other new stars. He anticipated that as the star cooled, the lines which indicated a similar constitution to that of the solar chromosphere would disappear. Some of these lines indicate a not improbable velocity of over nine hundred miles a second! Doctors, as usual, are disagreeing as to the cause of the genesis of the star. In the "English Mechanic," Mr. Edwin Holmes countenances Mr. Monck's theory of a star rushing through a gaseous nebula, while at the Paris Academy of Sciences, M. Janssen propounded the theory that in stars such as the sun, in which the temperature is too high for water to exist, there must come a time when the hydrogen and oxygen would suddenly combine. This combination would be the cause of an enormous and sudden increase of temperature, and hence of

light-production, and thus the appearance of a new star would be accounted for.

* * *

Notes on Photo-lithography. According to the "Moniteur de la Photographie," M. Hermann Schneider has patented a new process of direct transfer on to stone or metal. The inventor affirms that his process gives perfect impressions as regards gradation and fineness of modelling, reproducing with great fidelity all the details and effects of negatives. The surface of the stone is perfectly finely grained by the ordinary methods, but it is essential that the grain should be uniform and regular. After graining, the stone is treated to a bath of nitric acid, washed and rapidly dried, and slightly warmed, and the surface covered with a preliminary coating of gelatine, and then thoroughly dried at a temperature of forty degrees. A solution of

Albumen	20 c. c.
Saccharic acid	10 „
Water	200 „

is then applied, and the stone dried. Two other solutions are also prepared—

A.

Chrysaniline	2 grammes.
Chloride of zinc	50 c.c.
Water	1000 „

B.

Potassium bichromate	14 grammes.
Ammonium	30 „
Water	1000 c.c.

For use, these two solutions are mixed in equal parts and poured over the stone, which is then put upright to allow the excess of solution to run off. When the film is dry the stone is exposed under a negative: in a normal light this varies from ten to fifteen minutes. After insolation the stone is rolled up with a hard roller with a special ink composed of lamp-black, Venice turpentine, and writing ink mixed warm, to which is added a paste composed of bitumen, resin, and beef suet. The image is developed by passing very lightly over the surface a sponge saturated with water; when the picture is complete, the stone is gummed and dried. The stone is then washed to remove the gum, the inking removed by turpentine, and again washed, and then treated to a weak solution of nitric acid to remove the sensitive film. The stone is kept damp by the application of salt and water, and then inked up and treated as usual for ordinary work. This method gives excellent results on stone or metal from all photograpns, sketches, etchings, &c., and may be applied to printing in three or four colours.

* * *

Light and Sugar. The arsenical sugar scare, which has been occupying the public mind in so painful a manner for so long, gives a particular interest to questions of inverting sugar, the arsenic, as our readers are aware, having been introduced in the process of making inverted sugar by the aid of sulphuric acid. M. Henri Gillot, in the Bulletin of the Royal Belgian Academy, has been experimenting on the action that light exhibits in the inverting process. His experiments were, however, made with sucrose—in other words, cane-sugar—which, in its unaltered state, is unsuitable for brewers' purposes, as it ferments with difficulty. M. Gillot tried solutions of sugar with the addition of sulphuric or hydrochloric acid, and exposed them to light of different wave-lengths, similar solutions being made and kept in complete darkness for comparison; as a result, he finds that light of all wave-lengths brings about inversion, but that the sugar in its inversion by light is acted upon in a similar manner to the ordinary photographic light sensitive materials, the blue, violet, and ultra-violet being the most active.

* * *

Solubility of Mercuric Iodide and other Haloids in Organic Solvents. Herr Ottokar Sulc has published a list of these solubilities, and it is worthy of note to what a considerable extent the salts will dissolve in liquids which would *a priori* scarcely be expected to take them up. It is, of course, well known that bichloride of mercury, for example, is soluble in ether, and we now find that iodide of mercury, so useful in many forms of negative intensification, is soluble in quite a number of organic liquids—chloroform, for example, taking it up, with also the chloride, bromide, and cyanide, while for the iodide none of them had so great a solvent action as methyl alcohol of which ordinary wood naphtha is a crude form.

* * *

Soldering Aluminium. Like perpetual motion machines this problem is continually cropping up, the latest aspirant for fame being Dr. Joseph Richards, of Lehigh University, Bethlehem, Pa, U. S. A. The chief difficulty hitherto found is the thin film of oxide, which instantaneously forms on clean aluminium surfaces and so prevents the adhesion of the solder. This he overcomes by mixing with the solder an ingredient capable of removing the film of oxide during the soldering, so preserving clean surfaces till the union has been accomplished. Dr. Richards' solder contains an alloyed flux of phosphorus in tin. The "taking hold" of the solder is said to have been confirmed by results obtained in actual commercial practice. It need scarcely be observed that one factor in the enhanced price always asked for aluminium cases for lenses is the difficulty in soldering the tubes, and should this new process actually prove a success it is reasonable to suppose that the price of such instruments will come down, though it is always to be remembered that aluminium is very much more difficult to work than brass in the lathe, &c.

ON JUDGING DENSITY.

One of the most difficult things, perhaps, in photographic practice, is correctly judging the density of a negative, and stopping development at exactly the right moment. Even the most experienced workers often find themselves stumbling in this respect, and obtaining results they did not aim at or anticipate, while others again seem to have a happy knack of always withdrawing the plate at the critical instant. It is probably, to a certain extent, a matter of temperament and keenness of perception, which some possess to a greater degree than their fellows. Undoubtedly many otherwise expert manipulators find remarkable difficulty in this stage of their work, a difficulty that can only be

accounted for by some personal idiosyncrasy. After all, the recognition of the depth and intensity of a negative image in a weak monochromatic light is a decided test of visual fitness, and a more trying one than perhaps most of us realise. There are, however, a series of factors influencing the arrival at a correct estimation of the progress of development which might easily be kept constant, thereby reducing materially our liability to error.

It goes without saying that this question of density is one of considerable importance. The quality of our prints, and, to a great extent, the satisfactory rendering of tone values and gradation, depend so largely on the degree of opacity of the negative that we cannot afford to ignore the matter. There are some, indeed, who attach but little importance to the subject, arguing that intensification or reduction are so easily resorted to if any modification is required. Now it may be said that although these auxiliary processes are of great value in many cases, an intensified or reduced negative will not give such artistically accurate gradation as one correctly exposed and developed. Intensification and reduction may, of course, often effect a considerable improvement, but in such cases it will, as a rule, be found that the plate has been incorrectly exposed. To explain our meaning more clearly, it is generally the over-exposed negative that gains in effect by intensification, while those over-exposed and over-developed are likely to be improved by reduction. Under-exposed negatives, whether thin or over-developed, though certainly rendered more printable by reducing or intensifying, as the case may be, will almost inevitably have their gradation utterly falsified. Moreover, however satisfactory an intensified or reduced negative may be, there is generally no getting away from the fact that it would have been better still if such modification had been unnecessary. We will not attempt to define what is meant by satisfactory density, there are too many different opinions on the subject. That degree of opacity which each worker finds to give him the result which he desires, in the chosen printing process, is to him that which constitutes a successful negative.

Taking for granted, then, the value of correct density, we will approach the consideration of some of the factors that help or hinder its attainment. Certainly not the least of these is the illumination available in the dark room. When we take into account the Cimmerian gloom of so many of the places devoted to development, the wonder only grows that those who use them are able to develop with any degree of accuracy at all. The exact estimation of density requires a fairly bright light, one, moreover, that is steady and constant. Although many workers are fond of it, daylight, it need hardly be said, must inevitably cause great uncertainty by its frequently altering value. Somewhat contrary to the general idea, candle and oil lamps are open to much the same objection, for they do not burn, as a rule, with any remarkable uniformity. A little reflection, and one or two experiments, will soon convince any one of this. All things considered, gas is perhaps the best illuminant for the dark room. If the burner is kept in good order, the supply adequate, and the flame turned up to an uniform height, we have got as near, probably, to a satisfactory and unchanging light, for all practical purposes, as we could wish.

A word of warning may be spoken here against examining the negatives at varying distances from the lamp, since the apparent strength of the former will increase or decrease according to the amount of light they are viewed against.

The glass or medium through which the light is filtered is necessarily a matter of importance. Mr. Howard Farmer has shown us conclusively that a large amount of light may be allowable if only the medium employed for eliminating the actinic rays is suitable in quality, and tested to cut off only certain parts of the spectrum, and perhaps the old gloom and mystery of the dark room will presently vanish in favour of saner methods. We have at least the knowledge that should lead to better things, and condemn ourselves to darkness only by our own bad taste. This reminds us of the tale related of a well-known French photographer, who rushed excitedly from his dark room lately, perspiring and irritable. "Quelle chambre de diable!" he exclaimed impatiently. "Oh, don't call yourself names!" mildly expostulated his wife, who happened to hear him.

Ability to judge correctly of density depends not only on the light, but on certain uniform conditions being observed as regards temperature and developer. The necessity of keeping the dark room and the solutions employed equably warmed in winter, and of having some means of securing immunity from too great heat in summer, can hardly be over-rated. The best way of doing this depends, of course, largely on individual circumstances and requirements. Uniformity of developer is more easily obtained. Most workers will probably agree that, except in special cases, adherence should be made to the use of that developer which we have tried and found to satisfy our personal inclinations, and that it should be kept, as far as possible, of a known and definite constitution. We are all aware that the composition of the developer can be varied to secure greater or lesser density in the result, but, what we sometimes overlook, is the fact that not only apparent density during development has to be considered, but also the amount of loss that will take place in fixing. With some developers this loss will be greater than with others, and the negatives consequently thinner, although they may have developed to apparently sufficient density. This, of course, has to be allowed for, to the extent that experience teaches us is necessary.

A thing that does not generally receive sufficient attention is the condition of the fixing bath. A good many people imagine that the development of the plate is all that requires any particular notice, and that so long as the hypo will fix, matters are proceeding satisfactorily. In reality, however, the final density of the negative is often much affected by the state of the fixing bath, and it is decidedly worth while to keep it at a definite strength and temperature. The practice of repeatedly using the same hypo cannot be recommended as conducing to the best results; it is far wiser to make up quantities of a stock solution and to take it fresh as required.

Another factor to be considered in arriving at a precise determination of density is the character of the plate itself. A thickly coated plate being more opaque than one thinly coated, necessarily requires development to a greater apparent density than the latter. Some plates, also, other things being equal, appear to lose more than the average amount of depth in fixing. Films coated on celluloid and kindred materials are rather deceptive in this respect and require a certain amount of allowance to be made. The serious

worker soon perceives the advisability of adopting one brand of plate or film, and adhering to its use. He is then the better able to master its individual vagaries and to obtain perfect control over his results.

The kindly science of to-day has provided us, if we will, with a system of timing development, by noticing the time of appearance of the high lights,and allowing the plate to remain for a certain multiple of that time. Many people find this method quite sufficiently accurate to satisfy their wants, and succeed in producing excellent technical work by its means. Needless to say, however, the pictorial school, with their adoration of individuality and the personal element in a photograph, will have but little to do with anything that tends to make their work more mechanically exact, however scientifically correct in theory and practice such a proceeding may be.

We cannot conclude these remarks without describing the decidedly ingenious way in which a certain young beginner in photography, who cordially detests development, overcomes the, to him, inexorable difficulty of correctly deciding density. He one day got an expert friend, a well-known authority on all photographic questions, to develop a plate for him. This he straightway washed, without fixing it, and hunting up a few waste negatives of his, he pasted tissue paper on their backs, with the object of making them as opaque as they were before fixing. He then, in the dark room, and by his usual ruby light, compared the unfixed developed negative that his friend had done for him with those of his own which he had just prepared, until he had selected one of the latter which appeared of exactly the same density as the one previously developed. When he develops now, he simply examines his plate by the side of his prepared negative, and withdraws it when of equal density. This idea is simply given as a curiosity, but is certainly a good example of that inventiveness proverbially produced by necessity.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

VIII.—Otto Wiener (1895).

In his researches on stationary waves,[1] Wiener met for the first time the question as to the fundamental possibility of photography in natural colours. Whether Zenker's theory explained the older, pre-Lippmann, methods was not proved; indeed, the objections of Schultz-Sellack,[2] together with the fact that the possibility of preparing transparent thick sensitive films was unknown to him, caused Wiener to believe that the solution of the question arising from direct photochromy was far from being given.[3] After Lippmann's experiments, Wiener resolved to investigate anew the colour-reproduction of the older methods. His experimental investigations and speculative conclusions therefrom were published in 1895.[4]

Wiener spoke[5] of Schultz-Sellack's two main objections, and of Carey Lea's (1887) researches.[6] Carey Lea showed that the coloured matters arising from a coloured illumination of previously-exposed chloride of silver can be obtained in the dark by purely chemical means. In this connexion Wiener also mentioned[7] H. Krone's investigations.[8]

Wiener's problem was[9]: Are the colours in the older methods apparent-colours (Scheinfarben), or body-colours (Körperfarben) *i.e.*, do they arise (respectively) from interference or from absorption?

This can be decided[10] by the help of a right-angled glass prism of high index of refraction; in the former case, on regarding a plate of the photochrome through the prism, a variation in colour, as compared with the colour as seen in air, is experienced—and this variation can be calculated from the values of the refractive indices of the prism and film; in the latter case, no variation is found.

In this manner Wiener found that Becquerel's (and also Lippmann's) images arise essentially from interference, on the other hand the images obtained by Seebeck and Poitevin consist of body-colours. Schultz-Sellack's explanation by "dispersion-colours" (Zerteilungsfarben) was shown to be incorrect in both cases.[11]

With regard to the question as to how body-colours arise, it has been shown experimentally that the matters in the plate are capable of affording coloured combinations, among which almost all spectral colours are present. But of all the coloured matters capable of arising (entstehungsfähigen Farbstoffen), only that "homogeneous" with the illuminating colour can be permanent, because it reflects that light best, therefore absorbs it the least, and thus can be least varied.

This explanation was tested by projecting a spectrum on a spectrum-image at right angles to it.

It is thus in principle possible that coloured illumination may produce body-colours of the same tint in suitable materials. Such materials were called by Wiener "colour-susceptible" (farbenempfänglich) and the re-giving of colour, "colour-adaptability" (farbenanpassung).

In § 15[12] (at the end of the paper) examples for the existence of a "mechanischen Farbenanpassung"[13] in organic nature were brought forward,[14] and the paper ended with, in conclusion, a brief summary of the results obtained (§ 16).[15]

In interference photochromy then, Wiener conclusively demonstrated that certain actual results were due either wholly (as in the case of Lippmann's photochromes) or for the chief part (as in the case of Becquerel's) to interference processes; and this is practically a verification of the Zenker-Rayleigh-Lippmann[16] theory in these cases. This is Wiener's merit in connexion with our present subject; that he infused new life into the old idea of a direct *pigmentary* process is, perhaps, a still greater merit; but here we leave interference photochromy. Wiener's researches mark the decisive branching off of the two main tendencies in direct photochromy. Both interference and pigmentary methods remained concealed together in the work of the older experimenters. The bringing to light and the separation of the two was first attempted repectively by Zenker and Carey-Lea, each attempting to reduce the *double* question to *one* case. It was finally accomplished by Lippmann and Wiener.

Philip E. B. Jourdain.

SOCIETY DEMONSTRATIONS.

[Paper read before the London and Provincial Photographic Association.]

As the years roll on it becomes increasingly difficult for the Society Hon. Secretary to fill up his programme. And so it comes about that when one's own members fail us, we Hon. Secs. have to book

1 See The British Journal of Photography, December 9, 1900, 711-712 (*Wied Ann.*, xl., 1890).

2 We propose to go more fully into these objections on another occasion.

3 *Wied. Ann.*, lv., 1895, 225.

4 *Farben photographie durch Körperfarben und mechanische Farbenanpassung in der Natur.* Dated Phys. Inst. d. techn. Hochschule Aachen, April 25, 1895. *Wied. Ann.*, lv., 1895, 225-281. Although these researches were purely experimental, yet, "on account of their great theoretical interest," Professor Wangerin gave a short account of them in the *Jahrbuch über die Fortschritte der Mathematik* (1895, 952-953).

5 *Loc. cit.*, 226.

6 "On Red and Purple Chloride, Bromide, and Iodide of Silver; on Heliochromy, and on the Latent Photographic Image;" *Amer. Journ. Sci.* (3), (xxxiii., 1887,349 sqq; reprinted in The British Journal of Photography Supplement), February 1, 1901, 9-13.

7 *Loc. cit.*, 227-228.

8 These were contained in a lecture published in the *Deutschen Photographen Zeitung*, p. 327 sqq., and in his *Darstellung der natürlichen Farben durch Photographie* (*Verlag der Deutschen Photographen Zeitung*, 1894), see esp. p. 43.

9 *Loc. cit.*, 228.

10 The apparatus, &c., was described *loc. cit.*, § 2, 236-237.

11 *Loc. cit.*, 239-243.

12 *Loc. cit.*, 267-279.

13 In distinction to the "biologische Anpassung" which arises by natural selection (Darwin).

14 Here Poulton's studies on caterpillars and their pupæ, and W. Roux's "functional adaptability" were brought forward.

15 *Loc. cit.*, 279-281.

16 The three *independent* discoverers of the theory.

he prize slides of a photographic periodical, an affiliation lecture, illustrated by slides, read by the Hon. Secretary, in the most mournful fashion, or as a last resource the trade demonstration. The Hon. Secretary receives a type-written letter, "Department X Y Z and a bit to which all communications must be addressed," offering a demonstration of "Smith and Co.'s world-renowned grease remover and its system as applied to photography." What can the poor Hon. Secretary do? His own members are backward in coming forward, and he must fill up that wretched programme. So he accepts the grease remover, and moreover he prints it on his syllabus. Why he should print it there, I don't know, but he does. There are other places.

Well, the eventful night arrives, so does the trade demonstrator—sometimes. The evening is a success, the demonstrator knows what he is talking about—sometimes—or, if he fails to eventuate, the plate, paper, or film is duly discussed in his absence, and duly blackguarded right and left. So that in either case the evening is a perfectly successful one.

So far by way of introduction. I suppose you will gather from it that trade demonstrations are the last resource of an Hon. Secretary, and that trade demonstrators occasionally do not fulfil their promises? The first is very far from the truth, because in the provinces the trade demonstrator is welcomed with opened arms; he is, in fact, for the time being, a little tin god. The second conclusion is, however, more truthful, and if you heard, as I have heard, the bitter comments passed upon the demonstrator who did not turn up, and upon the firm he represented and their goods generally, you would at once say that some societies have suffered. Because, while some of you in London may look upon a trade demonstration as something to be borne with and endured, it is very different in the smaller provincial towns, at all events. There it is an important event, and one calculated to bring the members in strong force. As some proof of this, let me mention the case of one Society who could not be favoured by the firm with a demonstration for some reason or other. The Hon. Secretary wrote privately to the demonstrator asking his terms, and he consented to give the paper and demonstration for a fee of £5 5s., first-class railway fare, and hotel expenses. I am relating an actual fact as regards the proposed terms. Whether they were accepted or not is quite another story, but they were certainly entertained for a time.

If photographic firms realised the enormous mischief to their reputation, and, as a consequence, to their wares also, the somewhat careless (to use a mild term) consideration for even a small provincial Society they show, by not carrying out a definite promise, they would not send a post-card "regretting," &c., or a letter asking the Hon. Secretary "to do the demonstration himself, for which we shall be pleased to send you a printed lecture and specimens of the goods."

Although, as you know well, I have been travelling the country as a trade demonstrator for some months past, you must not forget that I am your Hon. Secretary, and therefore I have naturally two ways of looking at the matter. As your Hon. Secretary, I have been asked three times to favour a certain firm by allotting a night for their trade demonstrator, which I have done on your behalf. Three times that has resulted in failure. Do you think for a moment that I should be anxious to book a fourth engagement with that firm? And if you only heard the pathetic utterances of poor Hon. Secretaries about unfulfilled engagements, you would realise with me the importance of carrying out a promise, and thereby making friends of photographic society members.

Now, speaking as a trade demonstrator, but without any wish to make a claim for a record of any sort, I have done my part towards the firm that employed me, and towards the societies who favoured myself and my firm by booking a date for a demonstration of the Thornton film. Starting on September 3 at the Cripplegate Institute, on the 6th I demonstrated before you, and since that time have visited over 120 different societies in different towns. For eleven weeks straight off I demonstrated every night of each week, excluding Saturdays and Sundays; or, to put it before you perhaps still more plainly, starting on Monday, January 7 of this year, I demonstrated before thirty-three societies before the end of February. That is, there were only six nights free in the two months.

As regards railway travelling, my average has been 1450 miles per week, and by the time I finish Ireland next week the total mileage will be practicallly 30,000 miles. Whether that is a record, of course, I cannot say; but one thing may be asserted, which is, that I have never failed to turn up at the appointed time and place, and whether fresh from home or tired with long travelling the demonstration has always been given. To do this night travelling has been a constant and wearying necessity. Liverpool one night and Penzance the next, 17 hours' solid railway journey, and Aberdeen one night with a 13 hours' journey to Walsall the next day, having to get up also at 5.30 a.m. to get the train, are my worst experiences. This reminds me of a yarn. We in the carriage at Euston produced our tickets at the request of a polite inspector, and one chap asked whether the train stopped at Willesden. The inspector was not quite sure, and upon our expressing surprise at his not knowing, he told us how a few nights previous, "Thirteen Willesdens had been run to Rugby." Of course we asked whether the company sent them back by a special train. "No," replied the inspector, "they were chiefly company servants."

Now, I have journeyed on the South-Eastern and London, Chatham and Dover Railways, and still been in time. Surely that's a record. Constant train travelling is wearisome, but much depends upon the company. My first painful experience was during the recent general election with a carriage full of country farmers and other politicians, and I heard a good deal of their views on matters political. I have had to sit in a smoke-room and hear the locals discuss not only the local election, but the affairs of the Empire generally. That was my first affliction. Then came "the warrior home from the war." Generally a lance-private with whom somebody in the carriage discussed the whole conduct of the war in South Africa, and listened to the lance-private's opinions as to what General Buller or Lord Roberts ought to have done, but didn't, of course. Whilst we must all have the greatest admiration for the gallant boys from the front, it is sometimes tempered by the reflection that in a small railway compartment, especially when he is not a teetotaler, the returned warrior can become a nuisance, and very often does.

As regards the treatment a trade demonstrator receives, it can only be regarded as enthusiastic. There are, of course, occasions when coolness and scant courtesy are met with, but they are rare. I have met such treatment now and then, and have naturally made a mental note of that Society for future demonstrations. Provincial societies appear to have a very much greater regard for club rooms, or at least premises of their own. They go so far in this as to build rooms. The Chorley Society is one of these, and another is Airdrie. About the latter club room I feel a word or two is necessary. It was designed, constructed, and decorated by the members themselves. The accommodation consists of an excellent studio, used for the meetings, and also dark rooms, well devised and comfortably fitted up. Time will not allow me to go into further details, but the decorative work and general arrangement is far and away the best thing I've yet seen.

I want to have just one little go at Hon. Secretaries, or at least some of them. It is when they press a demonstrator to have tea with them before the meeting, and then afterwards trot out all their negatives and prints for criticism. I was once told distinctly that they expected any one who came down to demonstrate to help the Society by telling all he knew. And after tea I have had two solid hours of "How could this negative be improved?" "What is the matter with this one?" "What do you advise?" "What is wrong?" and so on. Two hours of it, mind you, and then to be expected to go to supper after the meeting for a smoke and a chat. Of course, the chat is the same thing all over again, until by the time you get to the hotel and to bed there is not a moment's rest from photography. Why it should be expected of trade demonstrators is hard to imagine, as the Society does not pay for anything; the demonstration is free, and the information they seek to get out of one is therefore extra free.

The demonstrator of a humorous turn of mind will always please better than a perfectly serious or dry-as-dust man. Moreover, he will get out of awkward situations with much greater ease. I don't mean the mere making of commonplace puns, or the too obviously dragged in jokes. The fun should be arrived at very simply, and really arise out of the subject-matter. However, it would be invidious on my part to say any more on this point. But you will not mind my telling you one yarn that always went down well in my own lecture. Referring to the complaint as to the curling of thin celluloid negatives, I said I thought too much fuss was made about it. Personally, I never had any trouble, because for a quarter-plate I used a half-hundredweight at each corner and the film kept perfectly flat. Besides, there is an advantage in curling. A member

of a society told me that once when developing, his film curled out of the developing dish, over the table, into the fixing bath, so that an automatic changing arrangement was the result. Then I waited for the sharp member, and generally he was there. He always wanted to know how, if it curled out of one bath, why it stayed in the other, to which I, of course, replied that it was "fixed" there.

A most amusing experience was of recent date. I was told that one of the members likely to be present had heard the demonstration previously at some other Society, and had been spreading round the alarming fact that at the other Society I had answered "I don't know" to some of the questions. This was thought to be a most serious fault. But I can draw a moral from it: if our trade demonstrators would only have the courage now and then to admit they "don't know" something their reputation would not suffer. To illustrate this, let me mention an actual experience at one demonstration. A member had bought a packet of the film, had followed the instructions implicitly (he was dead certain on this point), and had failed. Before I could reply another member rose and said he had had six of the films in that packet, having divided it with the first speaker. He, too, had implicitly followed the instructions, and —(Oh, oh, I thought, this is getting warm)—he had obtained six splendid negatives. The laughter that followed, of course, precluded the necessity of further reply. Now that is a case that really was unanswerable by the demonstrator, and it would be far better to say "Don't know," unless you make out the man who failed to be a ——. You can fill in the most polite form of the word.

Another point worth attention is to trouble the Hon. Secretary with as few requirements as possible. I carried everything required in a hand camera case on my shoulder, except a few times I borrowed a dark room lamp and two ounces of water. Simplicity in manipulation is a very great attraction to a new plate, paper, or film, or novelty of any kind, and loaded portmanteaus or a huge array of dishes, measure glasses, &c., which the poor Hon. Secretary has had to provide, rather kill the idea of simplicity, and frighten the novice.

In concluding this somewhat hastily written paper, I have no accidents or failures to tell you of, except one, and one only. That was upon an occasion when my developer bottles were broken. I got over this by soaking some tissue paper in the bottom of the bag, squeezing it out into the tray until I had enough to cover the film. Nevertheless, the resulting negative was in every respect a perfect one.

WALTER D. WELFORD.

THE PROPOSED PROFESSIONAL PHOTOGRAPHIC ASSOCIATION.

THIS week we print a further batch of letters relating to the proposed professional photographic association. Many more communications of a similar tenor are in hand; these we will endeavour to publish in the JOURNAL of March 29. A great number of other letters that bear on the subject must be withheld from publication. We thank the writers, who are all in sympathy with the great professional movement that is just now manifesting itself in our pages, but some of the ideas in their letters are not practicable; and others, again, while feasible, would not, in our judgment, prove beneficial to the cause. We have endeavoured, in the letters printed, to let all shades of opinion and sentiment appear; but the preponderating aspiration, it is plain, is cast on the side of "making up for lost time" and at once forming an association of professional photographers, national in its scope and field of work, and numerous and powerful enough to defend the rights and interests of its members in all parts of the kingdom, from which it is gratifying to note the following letters emanate:—

"I beg to say that any movement in the direction of the above shall have my support." JOHN RAYNE, Glendale Park, Maldon.

"Respecting the photographers' protection association, kindly put my name on your list. I beg to enclose business card."
C. EVERITT, Photo. Studio, Cradley-road, Cradley Heath.

"I am quite in accord with the idea, and shall have much pleasure in joining and supporting the efforts of the executive. As you say, 'It is time.'" LANG SIMS, 437, Brixton-road, London, S.W.

"I write to assure you of my readiness to practically support an organization of professional photographers, as suggested. Granted such as an established fact, might not the Benevolent Association stand a chance of revival?"
JOHN G. WILLIAMS, Bridge-road Studio, East Molesey.

"I am entirely in favour of the proposed association of professional photographers, and should be glad to join the same if it is started."
T. LEE SYMS, 69, Castle-street, Tyldesley.

"I am in favour of the proposed photographic association, and will gladly join, and give such help as may be necessary."
F. JENKINS, "The Studio," Southwold.

"I am strongly in favour of the proposed professional photographic association, and shall have much pleasure in becoming a member should such a society be established." J. WORSNOP, Rothbury.

"I shall be very pleased to become a member of the proposed photographers' protection association, and think the sooner it is formed the better." F. NAINBY, Challoner-street, Cockermouth.

"I should have the greatest pleasure in joining a professional photographers' association, and doing anything in my power to further its interests." TOM REVELEY, Market-place, Wantage.

"Please count me in to support the proposed professional photographers' association in all and every way in my power."
CHARLES DERESKE, Studio, East-street, Derby.

"I shall be very pleased to become a member of any scheme for the protection of the photographic profession, and I wish it every success." F. WHALEY, Regent House, Hall-gate, Doncaster.

"I will be glad if you will add my name to the list of those who are favourable to joining the professional photographers' association, if formed." G. ALLEN ROBINSON, Burlington House, Hawick.

"I am quite willing to join the proposed photographers' association; in fact, I will join anything to bring the profession in closer unity together."
A. COUPE, The Studio, 48 Wimslow-road, Withington, Manchester.

"Please add my name to the list of those wishing to see a photographers' protection association formed. Should be pleased to forward the necessary subscription when advised. Wishing the affair good luck."
EDGAR GAEL, 77, White Ladies-road, Clifton, Bristol.

"Will you kindly add my name to list of those in favour of photographers' protection association. Other professionals in this town have also expressed a desire to join. Wishing it every success."
R. GIBSON, Studio, 114, George-street, Limerick.

"I think that an association for the help and protection of professional photographers is much needed. I shall be pleased to become a member if such a Society is formed."
ROBERT FROST, Loughborough.

"Please to add my name to those wishing a professional photographers' association, and let us try and stop any further intrusion such as Ogden, Lever, and Co. before it is too late. Believe me your well-wisher." TOM G. FISHER, 174, Edgware-road, W.

"You have our best wishes for the success of the professional association. Please add our name to the list of those willing and anxious to join. It's the very thing that we so badly want."
FRENCH AND CO., 1, Railway-terrace, Wallington, Surrey.

"Re 'Smoke and Bubble' photographs. I think it is about time an association to protect the interests of photographers should be formed, and I shall be glad to become a member."
THOMAS LEIGH, Aubrey House, Abergele.

"Your proposal to found a professional association of the photographers of Great Britain and Ireland meets with my approval and support. Shall be glad to be present at any meeting."
RUDOLPH LEONHARDT, 3, Exchange-walk, Nottingham.

"We should be pleased to become members of a professional protection association, if formed. We sincerely hope that this useful association will be formed, and have every photographer's support."
A. H. GUMMERY AND BLACKHAM,
St. George's-square, Queen-street, Droitwich.

"I am sure photographers will thank you if you are the means of forming an association for their protection. I, for one, shall be very pleased indeed to join such an association, and give it such support as I can afford. Wishing you every success."
HARDINGHAM R. MEHEW, Lynn-road, Wisbech.

"Having read your interesting remarks on trade cutting by outsiders, we should like to co-operate in any scheme that may be brought about to stamp out the unfair competition which has been introduced by Messrs. Ogden and Lever Brothers."
J. WHITE AND SON, Beach-road, Littlehampton.

"In the event of a photographers' association or union being formed for the protection of our rights, and for the raising of the status of the profession generally, I will enrol myself, and gladly subscribe to the cause."
HENRY GILES, 124, Lammas-street, Carmarthen.

"You may rely upon us becoming members of any society formed or the protection of our profession."

ALEX. RAE AND SON, Banff.

"I beg to intimate that I am willing to become a member of the roposed association. Trusting it may soon be organized and in work-ng order." G. WOOD, Studio, 16, Monkton-road, Jarrow-on-Tyne.

"I should be pleased to join the proposed association for photo-raphers' protection, and trust the movement shall be well supported."

T. A. GRUT, The Central Studio, 5, Pollet-street, Guernsey.

"Re Ogden and Lever Brothers, I am quite willing to give my name n support, and subscribe towards any action you propose to take in he matter for the formation of a society for the protection of photo-raphy." T. J. EVANS, 5, Carne-street, Ludlow.

"Will you be good enough to add my name to the list in the event f a society being formed, and which shall have my best support. Now he time has come I trust things will be energetically pushed ahead."

W. HARGRAVE, The Studio, 82, Preston-street, Faversham.

"I shall be pleased to join an association of professional photo-raphers, and hope you will receive enough promises to enable a good tart to be made."

BENNETT CLARK, 74 Darlington-street, Wolverhampton.

"The professional photographic combination you refer to is just he very thing that is needed at the present serious time, and I wish ny name to be added to the list of those who are willing to do all in heir power to stem the tide of this photographic degradation that is aking place." H. DOWDEN, Parkside Studio, Bootle.

"I hope the present unrest amongst photographers may be the means of stemming the tide of invaders, such as 'Cloud and Lather, Ltd.,' or n a short time there will be a long list of unemployed. Please add my ame as willing to help any movement."

A. ROBERTS, 134, Stockport-road, Levenshulme, Manchester.

"Kindly place my name on your list for the professional photo-graphic association. It is a splendid chance for us to organize, and just the thing required, if we consider our own interests, and your valu-able paper is, in my opinion, our only means of so doing. It is a splendid start for the new century."

GEO. S. ELLIS, The Studio, Mansfield.

"I should be pleased to join a photographers' protection associa-tion, should such a society be formed. I should also like to suggest that, if you can publish the names of the firms who are supplying Messrs. Ogden and Lever with materials, it would be a good thing. We should know then who were our friends (?).

E. E. HINDLEY, 86, Talbot-road, Blackpool.

"In response to your suggestion re a general combination through-out England of professionals, let me say I shall be pleased to join such, and subscribe thereto, if put on proper lines. I do not write above for publication, as you will probably have too many for that, but if you wish to publish it, so be it. I append here only my name for future reference." CLIMAX.

"I think the idea of a photographers' protection association very excellent indeed. I shall be pleased to do all in my power to help the movement, personally and financially. If photographers will stand together in this 'bubble and smoke' business, the chances are that we may come out right side on top."

W. ANDERSON, 364, Hamilton-place, Partick.

"Ready, aye ready! 'United we stand, divided we fall!' Messrs. Latherpuff and similar dividend-earning combines must be taught that even pigmies can kick a little, and that when the pigmies combine in the national photographic association, they can find something even more effective than kicks to dispel their smoke bubbles, &c."

CHARLES EASTOE, Castle Hill House, Caistor, Lincs.

"With regard to the proposed formation of an association of photographers for their own protection, I shall be pleased to give the same my support, as I consider the doings of Messrs. Soap and Smoke should be 'nipped in the bud,' or, at any rate, further similar competition made impossible." FREDERIC LEWIS,

16 and 18, Gladstone-road, Sparkbrook, Birmingham.

"We are pleased to see that something is at last being done to bring back the profession to some standing, and heartily agree with an association for professional photographers being formed for the purpose of defending the trade, also to see THE BRITISH JOURNAL OF PHOTOGRAPHY giving such a helping hand in forming such an association. We (as we hope every photographer will) heartily respond to the call for union." NOBLE AND SON, Hamilton.

"I shall be pleased to be enrolled as a member of any society that has for its object the protection of the interest and legitimate rights of professional photographers. Had it been carried carried through, when proposed some years ago, we should have been feeling the benefit of such a combination now. I don't think there is any trade or profession so apathetic and blind to their own interests as photographers." W. MCLEAN, Hunstanton.

"Allow me to thank you personally for the interest you are taking in professional photographers, and will you kindly add our firm to the list as willing to join an association to protect professionals. Hoping that photographers will generally come forward in large numbers. If a meeting is called in London, will you kindly notify me of the same, when I will do my best to attend, and help what I can. Wishing you every success." EDGAR WILKINSON,

pro Wilkinson and Co., 29, Rampant Horse-street, Norwich.

"I quite agree with you, that the time is quite ripe for the formation of a society to unite us professional photographers for our mutual benefit. I cannot quite see how we are to grapple with such as Smoke and Bubble, but if we were united we certainly could better look after our interests than we can now do. Therefore I will have great pleasure in joining such a society, if one can be formed. So you can rely on me as one member."

T. G. SNOWDON, Field-street House Studio, Kettering.

"I am delighted to see that at last there is some likelihood of a national photographic society being formed. I, on my part, shall give it every support, and beg you to look upon me as an enthusiastic member and subscriber, and at the same time shall do my utmost to arouse others to their need of coming within the fold. Whatever monetary assistance may be necessary as a preliminary, I shall be only most happy to bear my share."

F. HARDIE, 416, Union-street, Aberdeen.

"We should like to add our name to the list of those in favour of the formation of an association for the protection of the interests of professional photographers. The Ogden-Lever competition is but one of the many matters that could, with advantage, be brought before such a combination, and we trust that THE BRITISH JOURNAL OF PHOTOGRAPHY will persevere until the association is an accomplished fact." H. and J. RIGDEN,

The Bowes Park Studio, 105, Myddleton-road, Bowes Park, N.

"I shall be glad to join any really strong and energetic union for protective purposes, &c. But unless strong and energetic, time and money are better devoted to additional efforts in one's own locality and business to secure the right class of client, and to turn out the best quality of work. The cheap men can compete with Ogden's and Lever's, and many are working as cheaply, though I think the Lever-Ogden competition unfair. The high-class professional won't be hurt."

C. H. HEWITT, Gateshead-on-Tyne.

"In reference to the proposed photographers' association, my partner and I would be pleased to be members. I think if such a society had been in existence photography would not have become an advertising medium for soap and tobacco as it is at present. If I may, I should like to make a suggestion. Why not engage a hall so that the matter could be thoroughly thrashed out? Whatever expense there is would be willingly met, say, by paying 1s. admission. Thanking you for the interest you are taking in this matter."

BIDDLE AND DOWDALL, 49, King William-street, E.C.

"We have read with interest your able leaders with regard to Messrs. Ogden and Lever's innovations, and thank you very much for what you have done. We herewith send you our names if it can be of any use in further trying to get some sort of society to protect our calling from further piracy. Trusting that your appeal will be ably seconded by all photographers, and that whatever you may do will be crowned with all the success it deserves."

WM. MITCHELL.

ROBERT CLAPPERTON, Meadow Cottage, Selkirk.

"With reference to your article in your issue of March 8 re the formation of an association for the protection of photographers, I beg to hand you my name for membership, in case that such an association be formed. I trust the time is not far off when photographers will band themselves together for the purpose of protecting the profession from the encroachments which have lately been made by people who have never been properly articled to the business. In case the scheme is successful, I shall be happy to send you my fee for membership." THADDEUS HELLI,

67, Yarburgh-street, Alexandra Park, Manchester.

"Re coupon schemes, &c. I have read the correspondence in your columns with much interest, also your able comments. I agree with Mr. Kenworthy, and, as a London professional, I suggest that (even a few) London photographers should meet together to form the nucleus of a national association, to at once discuss matters. Let us make up our minds that the discussion does not die away in wordy vapourings in the columns of your valuable paper, but leads to action by some association being formed which would be of use. The majority of us feel something ought to be done. Then let us proceed to action by calling a meeting."

H. EDMONDS HULL, 136, Holland Park-avenue, W.

"Allow me to thank you for the great interest you are taking in the concerns of the profession. Ever since I commenced reading your paper, I saw that it was the only one devoted to the profession, and I always look upon it as our official organ. I have pleasure in stating that I am entirely with you in your aims and objects, and trust every one will at once combine to put down all unjust competition, &c. I would suggest that, in order to make the meeting thoroughly representative, and enable every man of us to be present, that the place of meeting be as near the centre of the kingdom as possible. There are many things that have been glaringly unjust to the profession that can at once be removed or altered when we combine." A. G. Lewis, 62, Shawheath, Stockport.

"I should be glad to have my name added to the list of prospective members. That such a society is urgently needed, one has only to look at the advertisement lists of current literature, and there see the wonderful and permanent gems of Art (big A, please) which are practically given away for a pound or two of soap or a few 'self-burning' cigarettes. Probably this means 'twincant' art, the art which educates and penetrates even to the soapboilers' home. If photographers are to maintain their dignity, then, it is time for them to awake out of their slothfulness, combine, and let the world see that behind their art training is a strong body of business men ready at all times to fight and protect their mutual interests. Until such is done, Bubble, Smoke, and Co. will have it all their own way." W. T. Davidson, The Glenmore Studio, Minehead, Som.

"Will you add my name to the list of disgusted professional photographers? I stop from to-day the use of that gilded firm's tobacco, and also stop using the soap that won't wash clothes, also the other soaps that the Lever firm makes. I wish every photographer would do so also. I am sure there must be a great lot of the above used amongst photographers. I have seen the soap first-mentioned advocated as a great help in cleaning developing dishes. I have used the stuff for over four years myself. I have already felt the effect of those people's advertisement, and have had a few inquiries for just one photograph to see what they will be like when they are finished, you know, and then we will get a few more. I charge 5s. for that one, and see I get that 5s. first always. I am sure we shall all (photographers) be in a mess if we do not combine very soon. It is hard enough to do now, and what is to come shortly?"

J. H. Baker, Egremont.

"Let all professional photographers form a union in defence of their interests. Let the union confine itself strictly to business lines. Let a meeting be called at an early date, at London or Birmingham, when papers can be read and officers appointed. It is now becoming a very serious question with professionals, and, unless they can show a bold and united front, they will find that ere long wholesale piracy and an enormous flood of inferior low-priced enlargements will bring the profession into contempt, and cause the less thoughtful section of the public to expect the results of years of practice and hard work for next to nothing. I am convinced that it is only necessary to take prompt and united action to secure for professional photographers their just recognition as skilled workers, and the exponents of an absolutely indispensable art. The public should be taught what is due to a class of men whose efforts are so productive of amusement and instruction, and who only ask decently fair treatment, with the same consideration which is shown to every other professional class."

E. Debenham, Photographic Studio, 12, Clarence-st., Gloucester.

"Is it not a matter of grave consideration for photographers if they desire to uphold the dignity of their profession? I am surprised that the whole of the photographic community are not up in arms to protest against such methods of coupon photography as that carried on by Messrs. Ogden and Messrs. Lever Brothers, but, then, many of the leading photographic firms will console themselves by saying, "Such practices cannot affect or injure us." That may be, but I should like to ask these firms where their dignity is? What can lower the tone of our profession more than by employing photography as a means to sell cigarettes, or soap, as the case may be? Does it sound well? If photography is but in its infancy, what must be the result in, say, another twenty years or so? It has often been remarked that smoke and drink go together; the next thing we shall probably hear of will be drink and photography. Whatever the future may be is not to be thought of now; but I do consider that a great effort should be made by all photographers to carry out the suggestion for the formation of a photographers' protection association. Such an association would certainly prove an immense boon to photographers in more ways than one. I am glad our Aberdeen friends have made a start, and I hope it will be the means of urging others to follow in the same path. I would like to suggest that all photographers in every large town do arrange and hold meetings for the purpose of carrying out the above."

Wm. A. Parsons, 3, The Downs, Altrincham.

"I have read with great interest the discussion of opinions re the Ogden-Lever 'cheap photography' adopted by these firms for the extension of their businesses and sale of goods. I agree heartily with the suggestion of your remarks that photographers throughout the United Kingdom should have an association—as most other businesses and professions have of any note—and I think now would be a favourable opportunity for photographers in every town of any importance to bestir themselves in forming a committee for the furtherance and the adoption of a national photographic association, or any other name you wish to term it, having its headquarters, say, in London, with respective branches throughout the kingdom. It is now high time that photographers were doing something of this kind to protect their interests from the inroads of so many different schemes brought before the public on behalf of 'cheap photography,' having for its object the advertising of different kinds of wares, luxuries, &c. Alas, poor photography! How degraded it seems to have become when it has become so much resorted to, and the happy hunting ground for so many advertisers, &c., with seemingly fruitful effects. No doubt there is a lack of business capacity and enterprise on the part of many photographers. They seem to have no conception of the meaning of the term business, preferring to wrap themselves too much in the studio, and allow the business part of it to take its own course. Probably another reason of these firms taking advantage of photography is that, having no combination or association among ourselves we lack stability and have no means of defending our interests, and are trying to outdo one another probably by reducing and cutting prices, hence the result is you not only reduce your prestige as a profession, but open the door for these various forms of advertisement there is so much cry now about. Let us be up and doing, with a right good will and determination to combine without further delay. These are the times of combination (see Yankee), and not only will it be a protection against the lowering of our profession by such 'cheap photography,' but an incentive against the various other combinations we have to fight against in the way of manufacturers of photographic goods, &c., and who, with their combination and association, are in a position to dictate practically their own terms. Let us fight them on their own grounds, and, instead of airing our views in an occasional manner in a theoretical fashion by writing to our journals, take practical action by forming a thoroughly sound and reliable well-based association. The idea of appealing to the Copyright Association is not one, I think, that will be of much avail in the protection of a photograph taken and paid for by a sitter or client, and who chooses to have it copied by any other firm or persons at a greatly reduced rate. I would go further, and say that it would be detrimental to the interests of photographers if they could get such protection, in so far that many good orders have been booked from photographs taken by other photographic firms, and are being done every day, meaning in some cases a great increase of business, especially in enlargements, &c., and which, if one was debarred from copying photographs under the terms I have mentioned, would mean a very serious loss and decrease of business throughout the year. I am glad to see Aberdeen has taken up the cue, and wish it every success, and congratulate them on their timely resolution, and shall be glad to give them all the support they deserve in what I hope and believe will lead to a successful combination of photographers throughout the United Kingdom."

F. C. MacMahon, 23 and 25, Academy-street, Inverness.

There is no longer any doubt in our mind, from the foregoing and other evidences, that the professional photographers of the country regard the formation of an association for protective purposes as an urgent need of the time. It is a case of now or never. We for our part promise them to "see the thing through" until it is established on a firm and businesslike basis, but we most earnestly beg those who have not yet signified their willingness to support a properly constituted professional association to do so at once. The strength of such an association will be in its numbers and in the unity of its aims. It is only by such means that repetitions of the Ogden-Lever invasion can be thwarted and the hundred and one other interests of the profession that are constantly being assailed defended and safeguarded.

It will be observed that in the first paragraph of our "Ex Cathedrâ" notes on the front page of the Journal this week we give notice of a meeting called for considering the advisability of forming an Association of Professional Photographers for purposes of mutual interest and protection. That meeting, we may here repeat, will be held on Thursday next, March 28, at eight o'clock, at Anderton's Hotel, Fleet-street, London. ALL professional photographers are invited to attend. At the meeting a draft scheme which several well-known photographers have been good enough to assist us in preparing will be submitted, and if it is decided to form the Association, the election of officers and executive, the question of rules, subscriptions, and other matters of business can at once be taken in hand. We again hope that the meeting will be largely attended by London and country professional photographers, and we beg them to make

nown as widely as possible among their brethren. Meanwhile, in r most vital interests, we ask for more promises of support for an ociation, the establishment of which is imperatively and instantly anded if the photographic profession is to hold its own in the rce struggle for existence" which is proceeding daily amongst ses, as well as individuals. Let this call to arms be responded to t has never yet been responded to in the history of professional tography, and a powerful organization of far-reaching influence result!

THE LATE J. J. E. MAYALL.

OBABLY the oldest photographer in England, if not the world, sed away recently in the person of Mr. J. J. E. Mayall, who had ined the great age of 91. Mr. Mayall was a contemporary of rd, William England, and Claudet in Daguerreotypy nearly sixty rs ago, and he achieved great success in this beautiful branch of tography during the decade or so that it enjoyed the patronage he affluent classes. In the early sixties, when what is still termed carte mania was at its height, Mr. Mayall was extraordinarily cessful. The head of one of the London publishing houses has l us that their orders to Mayall at this time ran into hundreds of usands for certain subjects—one, in particular, we believe, was a trait of the present Queen Alexandra with one of her children. Mayall was thrice Mayor of Brighton, and had a photographic iness in that town, where his name still survives. The late well-wn microscopist, John Mayall, was his son, and another son is J. P. Mayall, the photographer. Of great ability and taste in profession, Mr. Mayall was full of energy and vitality. In the ly eighties, when past his three score and ten, we remember en-ntering him at his studio in Bond-street, and marvelling at his nomenal energy and enthusiasm. The portrait work then leaving studio would pass muster as first-class of its kind to-day. The e Mr. Mayall successfully practised portrait photography in its miest days, and if he had survived most of his contemporaries in journey of life, there are still some living who can recall his umphs, while to many younger men his name will symbolise some ases of professional photography in its golden age.

EXHIBITION OF THE WORKS OF COL. J. GALE.

E Seventh House Exhibition of the Royal Photographic Society, d at the Society's house, 66, Russell-square, and consisting of rks by Colonel Gale, was opened on Wednesday evening, the 13th t.

Colonel Gale is one of the very few photographers remaining ong us who, making a reputation as an exhibitor of pictorial photo-phs in pre-gelatine days, has maintained it to the present day. obably there is no one whose work has been more generally ad-red, and, certainly there is no one whose style has received so ch sincere praise in imitation. An amateur, his work has always pealed particularly to amateurs as being of a kind within the possi-ities of any one possessing a half-plate photographic outfit. It is mple photography, produced by simple photographic means, and stitute of the artifices of dodging, faking, or double printing, except e legitimate printing in of a sky. It is just the kind of work that ousands of amateurs are striving to produce every holiday season, t, even in these days of photography made easy, few come within easurable distance of their aim, and Colonel Gale's work is as dis-ctive as ever. In considering Colonel Gale's work as a whole, and om a modern standpoint, one is apt to underestimate its merit. To-y, technical excellence is not difficult to attain; the makers of ates and other photographic materials give us everything that we uld wish for to lighten our labours, and to smooth the way to ccess, but it was otherwise when Colonel Gale first came to the nt. Then every plate exposed was something in the nature of an periment. It might prove to be a good plate, or it might not, but any event to develop it into a good negative required an amount watchfulness and care that are quite superfluous now. To speak the old collodion dry plates, or the early gelatine ones, as good, dging them by the standard of the plates every maker supplies wadays, would be absurd. Apart from their slowness, which, after , was more felt in the limitations of the subjects that could be tempted than in any other way, there was a variableness about em that required the greatest skill and command of resource to al with. Under such conditions Colonel Gale produced work, not ly of the greatest technical excellence, but possessing pictorial alities of a high order, a combination which was extremely rare in ose days. At the Pall-mall Exhibition of 1879 Colonel Gale re-ived a medal for his picture of "Brixham Trawlers," taken, it is re-rded in the catalogue, on a gelatine plate, and at the same exhibition exhibited his famous "Swallow" picture, which excited an ani-mated controversy as to the bare possibility of photographing a flying bird. But at that time he had been an annual exhibitor for some years. The earliest catalogue we have access to at the moment is that of 1874, and that contains his name in the list of exhibitors.

There is much in Colonel Gale's work that reminds us of that of the early English school of landscape painters. Though his subjects are varied enough, and he has not confined them within our own shores, he is best known by his English pastoral scenery. This he has portrayed in a style that is distinctly his own, and in a way that proclaims a deep appreciation of and insight into the beauties of rural life. Though we are reminded here and there of Constable, of Old Crome, of George Morland, and of others, there is an individuality about all the work that should in itself be sufficient to negative the mechanical reproach on photography.

At the present Exhibition Colonel Gale has not fallen into the mistake made by some, if not all, his predecessors. He has not crowded the walls with everything that would go into a frame, but has wisely restricted himself to sixty works. There does not appear to be any of his very early work, but it goes back at least as far as 1883. Neither "Brixham Trawlers," which we have already referred to, nor "Red Deer in Winter," which received a medal at Pall-mall in 1881, is there, and we regret their omission. They were both interesting pictures in themselves, and to-day they would have possessed the special interest that they are landmarks of what was considered among the best work of their period, twenty years and more ago. Most of the pictures we recognise as old friends. Some of them, "Sleepy Hollow," "Ploughing and Twitch Burning," "Mid-day Lunch," "The Lonely Shore," "Little Chippers," "With a Porch at my Door," for instance, will be familiar to almost every one who has taken an interest in photographic work in the past two decades. It has been a pleasure to us to refresh our memory of the days when, on our first visit to the exhibition, among the work we sought the earliest was that of Colonel Gale. Even the spot assigned to it by custom, within the first twenty numbers in the catalogue, comes back to us. What we thought of it has been recorded from year to year. To-day it is beyond criticism; we look upon it with that reverence we accord the works of the old masters, and we leave it with the hope that its author will long be endowed with the health, strength, and energy to give us from time to time further proofs of his skill.

Our Editorial Table.

MODERN ASTRONOMY. By Herbert Hall Turner, F.R.S., Savilian Professor of Astronomy. Crown 8vo., 286 pp., 30 illustrations.

Westminster: Archibald Constable and Co., 2, Whitehall-gardens, S.W.

THE title of Professor Turner's fascinating book conveys no direct hint that photographers will find anything in it to interest them; but, in point of fact, there is hardly a page of the volume which does not deliberately appeal to the attention and the imagination of every user of a camera. The scope of the book is tersely indicated in the first five lines of the preface. It is an attempt "to show how powerfully astronomy has been affected by the scientific events of the last quarter of a century, and especially by the invention of the photographic dry plate." Professor Turner separates his subject into four sections: 1, Modern Instruments; 2, Modern Methods; 3, Modern Results; 4, Modern Mathematical Astronomy; and of these Nos. 1 and 2 perhaps deal more directly with the photography of astronomy than Nos. 3 and 4. Some idea of the intimacy of the association between photography and modern astronomy may be formed from Professor Turner's admission, on page 60, that the gelatine dry plate is the "most important new weapon with which astronomy has been provided since the invention of the telescope." Indeed, but for this weapon, it is doubtful if a considerable part of the twenty-five years' progress the Savilian professor so ably records would have been accomplished. Few readers will miss a single line of the first section, which, in addition to much historical information about Greenwich Observatory and the work done there, includes full data on the great telescopes of the world—the Lick, the Yerkes, the Bruce, the Pulkowa, the Thompson. Nor does the author confine himself to the work done by these wonderful productions of optical and mechanical skill. "Spectroscopy," which has "created a new department of astronomy so vast that it is practically a separate science, astrophysics" is also dealt with. Section two is very largely photographic. Writing of the necessity of systematically examining star photographs, Professor Turner says: "There are plenty of photographs already in existence to occupy several lifetimes in such examination. The Harvard Observatory alone has a practically inexhaustible store, and Professor Pickering has already, and several times, expressed his willingness to furnish material for any earnest worker. As has already been remarked, a man of any length of purse, or with no purse at all, may be an astronomer and a discoverer nowadays." He is sanguine that photography has new paths of use-

fulness open to it in the world of astronomy. "If the difficulties of photographing stars in the daytime could be satisfactorily got over, I should not hesitate to prophesy that some form of photographic instrument would entirely supersede the visual transit-circle in the near future." But if we went on taking out all the plums from one of the most delightful books that has recently reached us Professor Turner would have serious cause for displeasure, as this review would expand into a detailed reprint. Extended from three Royal Institution lectures, "Modern Astronomy" is written in an easy colloquial style, and makes altogether delightful reading. Here and there we come across a touch of sub-acid humour. For example, Dr. Common to (whom the book is gracefully dedicated) is quoted as comparing the reflector form of telescope to the female sex for uncertainty! By the bye, one omission from the book deserves reference. The astronomers appear to find modern gelatine plates yield deposits sufficiently fine in grain for their purpose. At one time the granularity of the image in gelatine was disadvantageously compared with the collodion "stain." No photographer who takes real interest in the applications of his favourite pursuit to modern science should miss reading Profesor Turner's masterly and stimulating volume.

The Dreadnought Acetylene Generator.

Manufactured and sold by W. Tylar, 41, High-street, Aston, Birmingham.

Compactness and lightness are leading features of this, the latest form of generator for that beautiful but neglected illuminant for photographic purposes, acetylene. Weighing only 6 lb., the height of the Dreadnought is 13¾ inches, the diameter at base being 7¼ inches, and at top 5½ inches. It takes a pound of carbide, and is claimed to illuminate a 9 ft. circle for about two hours with a double jet, the candle-power being estimated at about 250. The chief parts of the instrument are shown in the first three illustrations. Fig. 1

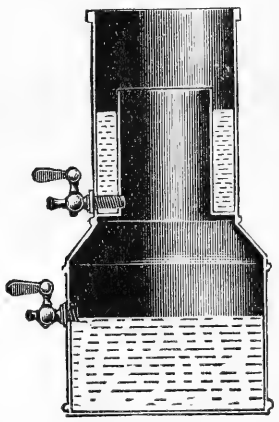


Fig. 1.

shows the outer case, or generator, a double cylinder containing water used for the generation of the gas; the lower tap is used to gauge the height of the water in the bottom portion, which is filled until the water flows from the tap. Fig. 2 shows the carbide holder. A rod passes through its centre, which is attached at its lower end to a valve, and is actuated by pressure on a spring at the top. This rests, when in use, upon the edges of the top water compartment. It



Fig. 2.

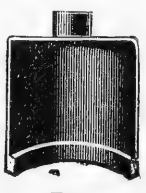


Fig. 3.

is filled with granulated carbide, by removing the screw cap shown on the left hand side of the spring. Fig. 3 is the gas bell, which is placed in the water in the top compartment, and rises and falls therein as the gas is made and consumed. As long as the gas bell is full of gas, no pressure can be exercised on the spring actuating the valve in the carbide holder, but as soon as gas is burnt, and the bell, which is weighted, sinks down—touching on the top of the valve rod—more carbide is dropped in the water, gas is made, the bell rises, and the valve is safely shut until the next touch of the bell. Fig. 4 shows the generator charged ready for use. We append directions for charging and using the Dreadnought, which, as the result of our inspection of it, struck us as neatly devised, simple in action, and well calculated to prove a useful means of obtaining a supply of acetylene illuminant without great trouble: Lift out the gas bell, remove the carbide holder, and fill with granulated carbide through the hole covered by the screw cap. Fill water in the base of generator, as shown by the dotted lines, until it runs out of lo tap. Fill water in the top compartment to within one inch of top. Hold the carbide holder over a sheet of paper, and touch top to see if the valve works freely, as will be shown by a sm

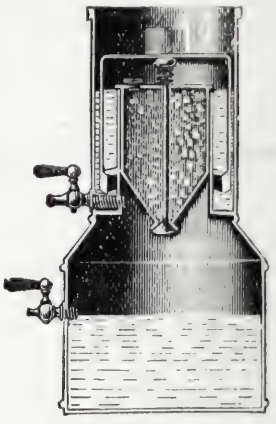


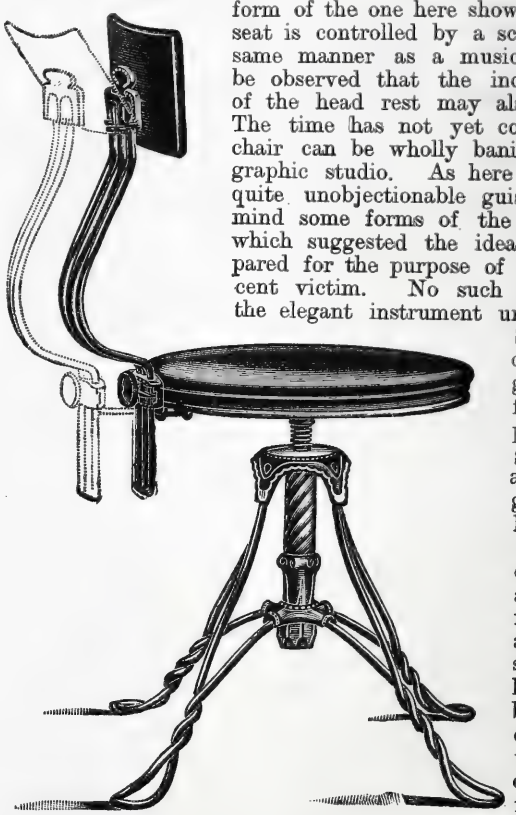
Fig. 4.

quantity of carbide falling, then place it in position in the generat Connect the top tap, by means of a rubber tube, to the gas jet suppo turn on this tap, and also the one on the gas jet. Place the gas b in the water in its compartment gently, when it will sink and ex the air. As soon as it touches the top of the carbide holder, g will begin to be made, and the bell will begin to rise. After it ris the second time, apply a light to the burner.

A New Posing Chair.

Manufactured and sold by O. Sichel & Co., 52, Bunhill-row, and 20, Berners-street, W

The professional photographer should appreciate that indispensab article of studio furniture, a posing chair, in the neat design a form of the one here shown. The height of t seat is controlled by a screw movement in t same manner as a music stool, while it w be observed that the inclination and positi of the head rest may also be easily actuate The time has not yet come when the posi chair can be wholly banished from the phot graphic studio. As here shown, it assumes quite unobjectionable guise. We can call t mind some forms of the head and body re which suggested the idea that they were pr pared for the purpose of electrocuting an inn cent victim. No such suspicion attaches t the elegant instrument under notice. Messr Sichel are constantl catering with intell gence and succes for the needs of th professional phot grapher, and ran among our most pr gressive busines houses.



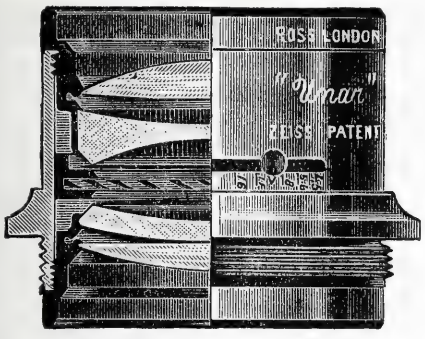
Their stud cameras and oth accessories are we made and serviceabl and at their Berner street showroom the have an assortment backgrounds an other furniture we worth inspection b our professiona readers.

The Ross-Zeiss Unar Lens.

Manufactured and sold by Ross, Limited, 111, New Bond-street, W., and 31, Cockspur-street, S.W.

Recently we had an opportunity of practically instituting a com parison between a Unar lens, made by Messrs. Ross at their Cla ham works, and a similar instrument constructed by the originato of the lens, Messrs. Zeiss, of Jena. Each was of the focus 8¼ inche working at the aperture f-5, and we were interested at ascertainin if any difference could be traced in the performances of the tw objectives. We easily satisfied ourselves that practically no diffe ence was perceptible. In respect of optical qualities the lenses wer

nearly alike that the most minute examination of the respective ges failed to indicate any points of dissimilarity that could mani- themselves in the negatives or prints. Coming now particularly he Ross instrument: at *f*-5 we found a half-plate covered beau- ly to the edges, and having a flatness of field allied with an agree- quality of definition such as would please the most exacting ographer. It is not so many years since the photographer of old school would have looked with the greatest surprise upon instrument which, at the great aperture of *f*-5, transmitted a iant image almost wholly deficient in curvature and astigmatism. se interested in the theory of the Unar are referred to the last me of the JOURNAL, in which Dr. Rudolph's specification out- the conditions of its construction. Unlike many modern lenses,



combinations are not detachable for separate use. Nos. 6, 7, and the series are of 8¼, 10, and 12 inches foci, and are recommended carte and cabinet photographs. At an aperture of *f*-5, it will be that they come very near to the older forms of portrait lenses apidity. The quality of the image given is such that they are adapted for work of this kind. To the hand camera man the 3, 4, and 5 of the Unar series will also strongly appeal. With of 4½, 5¼, and 6 inches the working apertures are *f*-4.5, *f*-4.5, *f*-5. This series realises an old aspiration of the late Mr. J. ll Taylor. Both in these pages and elsewhere that well-remem- d worker often sighed for a "slum lens," as he termed it, an ument other than a portrait lens, and working at *f*-4 or *f*-5, h he could attach to a small hand camera, and with which, in corners and confined spaces, he could atone for the poorness of light by increased size of working aperture with full covering er. The Unar lens would have certainly satisfied his aspiration. n the point of view of the optician, as well as that of the photo- her, the Unar is the latest word in lens construction. It appeals e hand camera worker, and the portrait and group photographer, thus merits the old-time designation of "universal."

The Holborn Hand Cameras.

ufactured and sold by George Houghton & Son, 88 and 89, High Holborn, W.C.

their series of "Holborn" hand cameras Messrs. Houghton in- us that considerable improvements have been added for this on, the principal of these being a variable speed adjustment to shutter, which also admits of time exposures. Of one of the uments, that selling for a guinea, we subjoin the following

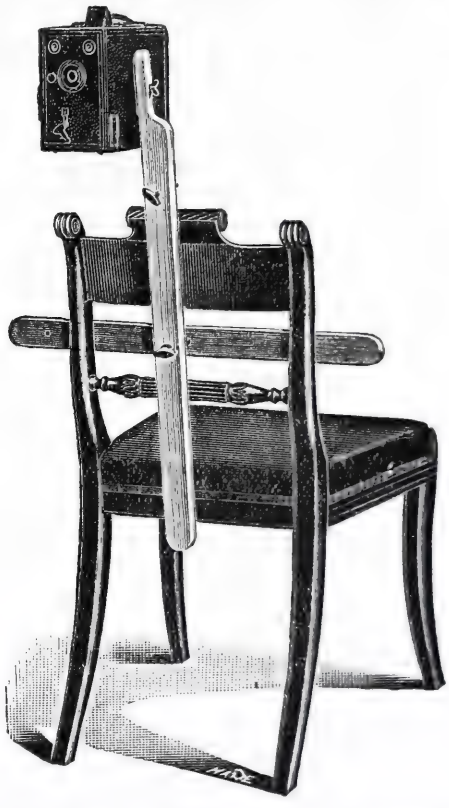


ils. It is covered with a waterproof material of a hard surface, in appearance resembling leather. The lens, a single achromatic, is rolled by rotary stops, adjustable from the outside, and the ter before mentioned. There are two finders, and sheaths for s, and the changing arrangement actuates a recorder which indi- the number of plates exposed. The external dimensions of the camera are 7½×6½×4. A similar camera is fitted with a doublet instead of a single lens. We may mention that a special catalogue is devoted to Messrs. Houghton's magazine hand cameras and hand camera stands, and a glance through this list shows that both are obtainable in great variety to suit all photographic tastes.

The "Gripper" Camera Support.

Manufactured and sold by George Houghton & Son, 88 and 89, High Holborn, W.C.

This is a device for attaching a hand or stand camera to a chair, &c., which should prove useful in home portraiture, copying, or photography in situations where an ordinary camera stand cannot be conveniently used. The "Gripper" is readily attached to any chair, table, mantelshelf, door, gate, fence, and is also adaptable



for copying a photograph or other object in a vertical position. The illustration shows the apparatus in use on a chair, and in this case, and on all similar objects, the centre screw only is used, its purpose being to draw the two arms closely together, thus gripping the chair tightly at four points. This useful adjunct to photographic work indoors sells for the low price of 3s. 6d.

The "Planiscope" Supplementary Lenses.

Sold by J. J. Griffin & Sons, 20-26, Sardinia-street, Lincoln's Inn-fields, W.C.

The use of supplementary lenses was advocated by the late Mr. J. Traill Taylor and other authorities on practical optics a good many years ago, and in issuing the present series Messrs. Griffin will, no doubt, earn the thanks of amateur workers for enabling them to obtain a



variety of focal lengths from one objective by the temporary addition of suitable glasses of the necessary power. The Planiscope Supplementary lenses are neatly mounted in metal, and their uses are thus described by Messrs. Griffin:—"The wide-angle Planiscope

transforms an ordinary R.R. lens into a lens of as wide an angle as under ordinary circumstances is ever required. The same remark applies to the Telephoto. These two lenses are of great use in pictorial photography, as it frequently happens that a position is secured which is ideal except that the best part of the picture is too small on the plate being too far away and the foreground occupies too much space. By introducing the telephoto lens this difficulty is at once removed. On the other hand, sometimes upon focussing the picture much aggravation is caused by discovering that an object near to the lens occupies too prominent a position, and yet the camera cannot be moved, as otherwise the aspect is changed. By introducing the wide-angle lens the object in the foreground is toned down into a position more in harmony with true composition. The Portrait lens, in addition to making the taking of portraits possible with an ordinary R.R. lens and a camera of short focus, gives a softness and delicacy which is usually obtained with a portrait euryscope. The Copying lens is useful where the operator wishes to photograph an image of the same size, and has not a long extension to his camera."

News and Notes.

THE new address of Mr. Ezra Clough is 10, Farcliffe-road, Toller Lane, Bradford.

ROYAL Photographic Society.—Technical Meeting, March 26. Mr. J. H. Agar Baugh will read a paper on "Some Improvements in Optical Projection," at 8 p.m. The exhibition of photographs, by Colonel J. Gale, now on view at 66, Russell-square, may be seen daily from 10 to 4 (Wednesdays, 10 to 8), on presentation of visiting card.

THE Inventor of the Oxy-Hydrogen Light.—According to "Lanterna Magica," we have all of us been wrong in ascribing to Drummond the invention of the limelight, for its real inventor was Goldsworthy Gurney (1793-1873), for in a book written by him entitled, "A Course of Lectures in Chemical Science," he describes this method of lighting. Drummond used it in 1826 in Ireland for trigonometrical work, and in the same year he stated that Gurney had described to him the light.

SENSITISER for Infra Red.—Hans Lehmann recommends, in the "Archiv für Wissenschaftliche Photographie," the following mixture:—Alizarine blue bisulphite (1:500), 2 c.cm.; nigrosine (1:500), 1.5 c.cm.; ammonia (sp. gr. 0.91), 1 c.cm.; distilled water, 100 c.cm.; silver nitrate (1:10), 5 drops. The plates are to be bathed in this for two minutes, and then dried in the dark. It will doubtless be remembered that Higgs of Liverpool was the first to use alizarine blue bisulphite for his excellent infra red spectrograms.

AT the Liverpool Photographic Association meeting on Thursday last, the President, Dr. Llewelyn Morgan, gave a lecture on "Pinhole Photography." He very lucidly explained his method of working, described the means by which the pinholes might be made, and by a series of diagrams and formulæ, showed how to calculate the point at which the maximum amount of definition might be secured. The lecture was illustrated by about eighty prints by well-known pinhole workers, including Messrs. W. M. Hensler, Charles Job, Wm. Rawlings, and Dr. Morgan. The prints will remain on view in the club-rooms for about a week.

A NEW Estimation of the Velocity of Light.—Olaf Romer was the first, in 1676, to measure the velocity of light by the eclipse of the moons of Jupiter, and he reckoned it out at 311,000 kilometres per second. Many remeasurements have been made, and notably by Fizeau, who used the reflection of light through a toothed wheel revolving at known speeds, the light being sent from the original station to another eight kilometres distance, and thence reflected back again. Last year the well-known astronomer, Perrotin, utilised the same method with a distance of about 12 kilometres, and no less than 1480 measurements were taken, and the mean of these gives 299,900 kilometres as the velocity of light. Michelson, in 1899, also made numerous measurements, using Foucault's revolving mirrors, and there is considerable agreement with the results obtained by Perrotin and Michelson.

YORKSHIRE Photographic Union. — The Annual Meeting will be held in the large hall of the Grammar School, Bradford, on Saturday, April 27, when the proceedings will be opened by a meat tea, at 4.30 p.m., followed by a short business meeting, address by the President, &c., and a conversazione and exhibition of prints. Contributions of mounted photographs, of an interesting or pictorial character, are invited, and the committee are particularly desirous for each club in the union to be efficiently represented. These prints should be sent to the Hon. Secretary, at the Grammar School, Bradford, so as to arrive not later than the Saturday morning on which the meeting takes place, or they may be brought in the afternoon by any members attending. No slides are required. Associates are also invited to bring with them any interesting apparatus they may possses, which however, must be kept in their own charge during the evening.

KIRKCALDY Photographic Society's Exhibition. — A photographic society which is only two years old, with a membership of eighty, and premises admirably adapted for photographic work, augurs well for future success. The exhibition of members' work was opened to the public on Saturday, March 9, and reflects great credit on the members. Several of the pictures, in fact, would hold their own in larger and more important exhibitions, and the same might be said of the admirable sets of lantern slides sent The following are the classes and awards:—Class I. Contact prints, a subject, any size. First prize, Mr. Charles Stewart; second, Mr. Harley; third, Mr. A. Purves. Class II. Enlargements, any subject, a size: First prize, Mr. David Storrar; second, Mr. Hope P. Thompso third, Mr. W. L. Little; certificates, Mr. J. D. Swanston, H. P. Thompso and Mrs. Landale. Class III. Snap-shots in sets of fours: First pri Mr. J. D. Swanston; second, Mr. J. D. Swanston; third, Mr. J. M kenzie; certificate, Mr. W. Lockhart. Class IV. Lantern slides, sets six: First prize, Mr. A. Harley; second, Mr. A. Harley; third, Mr. Stewart; certificate, Mr. S. Stewart. The judges were Mr. Jar Lessells, Art Master Leith Academy; and Mr. James Patrick, Edinbur

Commercial & Legal Intelligenc

THE Austin-Edwards Monthly Film Negative Competition.—The pr camera for the current month has been awarded to Mr. William Sow 207, Stoney Stanton-road, Coventry, for his negative "The Carpenter.

MESSRS. J. H. Dallmeyer, Ltd., have paid a dividend for six mon to December 31, 1900, at the rate of eighteen per cent., making a to with the interim dividend declared and paid in July, of fifteen per ce for the year.

THE prize of a folding camera awarded for the best negative on Tho ton films has been won by Mr. Stubbs, of Broadheath. The cash pri for best prints on Thornton papers have been awarded as follov First prize, Mr. A. Dunn, of Wotton-under-Edge; second prize, Mr. J. Paterson, of Glasgow; third prize, Mr. McLean, of Belfast.

MESSRS. Penrose and Co., of 109, Farringdon-road, London, E. write: "We beg to advise you that the continual growth of our busin has rendered it necessary for us to move into more commodious a suitable premises, and we have accordingly taken the building at 1 Farringdon-road, E.C., with works in Little Saffron-hill, immediat adjoining. Our telephone number will be '1891 Holborn.'"

FITCH'S Flat Films. — We have received from Messrs. Fitch, " pioneers of cut films," Seldon House, Fulwood's-rents, W.C., a nea printed little book of twenty-eight pages, giving prices and full det of their various makes of films and apparatus and developers for th manipulation and treatment. Two or three extracts from the introd tory remarks may prove of interest. Messrs. Fitch say: "Celluloid fi were first introduced by us to the photographic world in the year 18 and since that date down to the present time we have made films special study. The great increase in the demand for our films has co pelled us to enlarge and improve our factory, which is now, we belie the largest and most perfectly appointed factory in the world, devo exclusively to the manufacture of films. As regards keeping qualit we venture to assert that, under equal conditions, our films will keep well as any glass plates on the market. The very large quantities our films, which have been used in South Africa, have given the m satisfactory results, and they have been in continual use by several of leading war correspondents and others. Our films have been used w the greatest success in every part of the world, and, properly pack they will stand any climate. We beg to call special attention to the f that we have just completed the fitting of special machinery for manufacture of cinematograph film."

Patent News.

THE following applications for Patents were made between March 4 March 9, 1901:—

TRANSPARENCIES.—No. 4531. "Improvements in and relating to the Proc tion of Photographic Pictures on Glass or any other Transpa Medium." ABRAHAM HART.

STEREOSCOPIC PHOTOGRAPHY.—No. 4846. "An Improved and Simpli Appliance for Altering at Will the Amount of Separation of a Pai Stereoscopic Lenses on the Camera Front and fitting an Ordin Stereoscopic Shutter to these Lenses at the Different Distances Separation." BERNARD GREEN.

STEREOSCOPIC PHOTOGRAPHY.—No. 4847. "An Improved Method of Adj ing the Centres of Stereoscopic Lenses, in connexion with Came Shutters, and the like, and in Apparatus for showing Stereosco Pictures." BENJAMIN WILLIAM HORTON.

ANIMATED PHOTOGRAPHY.—No. 4900. "Improvements in Apparatus Exhibiting Series of Photographic or other Pictures in Successi particularly applicable for exhibiting Animated Pictures." LEOP BRETON.

SHUTTER.—No. 4953. "Photographic Shutter." EDWARD FERDINAND GR

FILM AND PLATE CHANGING.—No. 4960. "A New or Improved Method and Means for Loading and Unloading Photographic Cameras w Plates or Films." DAVID ABRAHAM LOWTHIME.

X-RAY APPARATUS.—No. 4981. "Improvements in or relating to Röntg ray Apparatus." GEORGE BOWRON.

X-RAY APPARATUS.—No. 5077. "Improvements in Devices for X-ra Complete specification. FREDERIC DE MARE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
.....	Bradford Photo. Society	*Switzerland and the Paris Exhibition.* J. Skirrow.
.....	Camera Club	*Colour Photography by the Sanger-Shepherd Process.* A. Pringle.
.....	Glasgow and West of Scotland .	Prize Slides.
.....	Aintree	Annual Meeting.
.....	Birmingham Photo. Society ...	Loan Exhibition of Views of South Africa, taken by Dr. Hall Edwards.
27	G.E.R. Mechanics Institution...	Annual Exhibition.
.....	Newcastle-on-Tyne	*Some Points in Lantern Slide Making.* W. E. Cowan.
.....	Borough Polytechnic	*Some English Cathedrals.* F. W. Gregg.
.....	Croydon Camera Club	Seventh Annual Rummage Sale.
.....	Derby	Annual Dinner.
.....	Camera Club	*Book Illustrations, Old and New.* H. B. Wheatley.
.....	Darwen	*Negative Faking.* J. W. Smith.
.....	Hull	*Ozotype.* W. J. Williams.
.....	Liverpool Amateur	*Some Applications of Photography to Scientific Inquiries.* W. E. Plummer, F.R.A.S.
.....	London and Provincial	Paper by E. Human.
.....	Oldham	*Our Visit to Chatsworth.* J. Chadwick.
.....	Woolwich Photo. Society	*Architecture.* H. W. Bennett, F.R.P.S.
.....	Aberdeen	*Slide Making.* G. Girdwood.
.....	Ashton-under-Lyne.....	Social Evening.
.....	Croydon Microscopical	*Outdoor Photography.* A. Horsley Hinton.
.....	Croydon Camera Club	Annual Dinner.

ROYAL PHOTOGRAPHIC SOCETY.

ECHNICAL Meeting,—March 19.

Mr. John Spiller, F.I.C., F.C.S., in the chair.

The Chairman briefly reported that he had represented the society at e funeral of the late H. P. Robinson, at Tunbridge Wells, as requested the council, and added his own testimony to the high opinion which the otographic world entertained with regard to the deceased gentleman.

Mr. W. J. Holt, of Messrs. J. Swain and Co., Barnet, colour and half-ne block makers and printers, sent for inspection several three-colour lf-tone line screen prints taken direct from nature, the quality of ich was generally much admired.

Mr. Charles B. Howdill, A.R.I.B.A., of Leeds, gave a lecture upon the

'HOTOGRAPHING OF STAINED GLASS BY THE THREE-COLOUR PROCES'

The lecturer first dealt with glass manufacture, showing lantern slides presenting the various stages of the blowing and shaping of glass at the rnace. It may be stated that the lecture was principally based upon the des, and the resumé that we here give is from a great deal of interest-g information that fell from Mr. Howdill's lips. Both the Joly lined reen method upon one plate, and the Sanger Shepherd process of ree superimposed stained films, were employed. The artist's sketches r a memorial window were first shown, followed by pictures showing e building up of the design itself and the leading. The audience was en initiated into the details of the designs and the many styles of ogressive centuries. The lecturer's first successful attempt at the presentation of stained glass windows by a natural colour process, is by the Joly process which, at the time, he considered the easiest ethod to work. It took him just two months to obtain, what with ing wrong plates and so forth, and then with nothing less than four urs' exposure. In examining the photograph he had only one adverse iticism to offer and that was in regard to a portion of window that had en rendered as a red instead of a yellow. The other reds were correctly rendered. The difficulties of near approach to some of the more inter-ing windows in our cathedrals, and minsters are naturally not to be spised. But in some cases the tele-photographic lens had to be em-oyed. There was an immense amount of work to be done in this field photographic work; there was more old glass in York than in any urch in the world, leaving out of the question attention that might paid to modern stained glass. He had devoted some time to the lineation of old glass windows, a task upon which in regard to York one, a man could spend his whole life. Some such pictures were shown, d the designs traced out and explained. It was of little use for a man o was colour-blind to go in for this class of work. Those who succeed st will be those who have made a study of colour and of the work of eat artists. Many of the pictures were by the Sanger Shepherd process; r. Howdill's remarks about his own work in this direction are there-re of interest. He used the "Absolutus" colour filter, and for velopment the "Sanger Shepherd" special developer which, for quick-ss in action and fine gradation, was to be highly commended. With a rrect exposure or series of exposures development was completed in out two minutes. He practically developed his plates in the dark, and time—counting 120 seconds and then rinsing and fixing the plate, ich was a thing not to be tinkered with. If the exposure be right, what ould be white glass in the resulting slide should have an even, identical posit in the three negatives. Variations from this standard at once dicates incorrect exposure, as the colour records must be wrong. ferring to the plate-backing used for this kind of photography, the turer showed that with an ordinary red-coloured backing material, e red record negative was suffering badly from halation. The same cking for the blue negative gave no halation; but the obvious lesson s that no red backing would serve for this work. The exposures re-ired ran often into hours, the depth of the colouring being a factor that ust be very carefully weighed. The lecturer's system has been to expose a Wynne's meter on the outside of the window, counting the number of seconds required for a tint, and multiplying the exposure thus indicated by a factor which varies very considerably, and can only be arrived at by experience for each particular case, on its own merits. An example of the importance of the slide-maker knowing the colour of the window was shown in a slide which was not, Mr. Howdill said, correct in the reds as regards intensity. One of the windows shown was taken, owing to exigencies of situation, with tissue paper outside in order to diffuse the light. Mr. Howdill brought his lecture to a close with a few landscape pictures by the Sanger Shepherd process, which were very successful examples of the possibilities of the process.

Mr. E. Sanger Shepherd said that all credit was due to Mr. Howdill who had worked entirely without assistance from anybody from the commencement. As regards the defective colouring of the red slide mentioned, the case might be explained. In one or two of the slides the blues predominated, an effect due to the fact that the red negative had been under-exposed. Of course, the temptation in cases like these, of such long exposures, was to cut down the red, but such a course was fatal to success. It was far better to cut down the blue or green than the red, as far as the effect on the result was concerned. The red must be fully exposed. He corroborated what Mr. Howdill had said regarding "backing" in colour work: it must be such as to prevent the reflection of all wave-lengths. Caramel and burnt sienna may prevent halation in the blue image, but the red will be more halated than it would without the backing. The best of all backings for orthochromatic work, or three-colour photography, was Indian ink and caramel. A lot of Indian ink, expensive though it be, is required. Plate-makers object to caramel because it tends to chip off in flakes when the plates are used in hand cameras, causing spots. Mr. Cadett, as a compromise, undertakes to back the spectrum plate with Indian ink and gum, a mixture that does not split away.

Mr. Howdill said that the black ink used by stencil makers answered excellently as plate backing. Another was provided by black sticking-plaster firmly squeegeed into optical contact.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 14,—Mr. Robert Beckett in the chair.

Mr. J. E. Hodd passed round a printing-frame, entirely novel in design, allowing the whole of the print to be seen at one time during printing.

Mr. S. Herbert Fry showed a P. O. P. print, and called attention to the fact that a part of the print presented a blue tint quite different to the rest of the picture. The negative from which this was made had nothing unusual about it, but he could not now show it because it was not his property and it had left his hands. The photograph was one of a lady dressed in a material which in parts was striped with a very close stripe, and it was a certain portion of this striped stuff that presented in the print a colder tone than the rest of the print. The matter came to Mr. Fry's notice by reason of the fact that some carbon prints were made from this negative and supplied, but were criticised with reference to this identical phenomenon. Other prints made by various processes and in various colours also exhibited the remarkable effect. The question he asked was whether it was an effect produced in the print or an effect due to the contiguous lines.

There was a long conversational discussion about the print and its peculiar appearance. By one it was suggested that the critical sharpness of the lines at this particular part of the photograph, with the deep tones in sharp contrast with the white lines, might cause the effect. That it was an optical illusion was thought by several, but Mr. Fry said it was a normal effect of vision upon everybody who saw it. If it were merely due to the lines it was strange, he thought, that in an engraving where there were similar lines, the same phenomenon was not produced.

Next it was suggested that astigmatism of the eye might cause it, and the print was viewed in all positions to test the suggestion. Astigmatism of the lens was the reason next advanced, but Mr. A. Haddon and others disputed this view, and it was attributed by Mr. Haddon solely to the sharpness of the lines.

Mr. J. W. Hodges spoke of the poor definition he had got with an extension lens made by a well-known firm to replace the back combination of one of their lenses. It raised a discussion regarding the effect such supplementary lenses had upon systems which, in themselves, were chromatically corrected, and it was thought that although one's work may not noticeably suffer, there must be a decided interference with the correction of the lens. Cases were mentioned where a certain latitude was allowed, but other lenses where the correction for colour was easily disturbed were also alluded to.

Mr. T. K. Grant showed a Sandell Cristoid film containing five twelve by ten negatives, the exposure of which to the same subject and with identical lighting, ranged from two seconds to twenty seconds. The film was developed in one length with pyrocatechin (1:20), but the similarity of the resulting negatives was such as to speak well for the latitude allowed by the film. There was a growth of density towards the end of the film which received the longest exposure, as was to be expected.

PHOTOGRAPHIC CLUB.

MARCH 13,—Mr. J. R. Gotz in the chair.

Mr. F. A. Bridge put the following question for consideration: "If a customer informs you when he wants a picture copied that it was taken at his own cost, or that it was taken by a friend whose permission he has to have it copied, does that or any similar statement exonerate the man who copied it from responsibility in case of infringement of copyright?"

It was generally the opinion of those present that it did not exonerate

the man who copied the photograph, although, perhaps, he might have a right of action against the man who gave the permission.

"What is the best developer to use with stale plates, or how can the best results be obtained with them?"

The Chairman, replying to this question, said that he had used at times some very old plates, and out of ten or a dozen might get two or three negatives that could be used.

It was suggested that nobody would run the risk of working with stale plates for any job that was important, although it might be that they could be used for home work and give good results.

Mr. F. A. Bridge said that he came across some three-year-old plates which he used, estimating exposure and development with due attention to age, but found that the negative was covered with those curious patches that were found when one copied an old print or engraving that had gone yellow.

Mr. Foxlee, referring particularly to the life of plates, said that he purposely bought some stale plates some years ago, all of which were known to have been originally good. They must have been six or seven years old. Some of them he found in such excellent condition that he secured the rest of that brand that was for sale.

Mr. P. R. Salmon said that when travelling in the East, he was most particular to use only plates that had been specially procured from home.

Mr. Foxlee remarked that he found kachin to give better results on stale plates than pyro-ammonia.

Mr. Bridge found that it was difficult to get density into the films of stale plates, and that persistent efforts generally resulted in fogging the plate.

It was the general opinion that slow development, with the free use of bromide, was the best treatment for stale plates.

The Chairman had no doubt that a good plate with plenty of silver, and less gelatine in proportion, would stand much longer; the gelatine itself was a very uncertain element in a plate and the less of it, in reason, the better.

Mr. Bridge added that the mode of preparation of a plate was undoubtedly of more importance than the amount of silver allowed. He had been informed that stale plates might be restored by treatment with electric ozone. Perhaps the seaside would suit them.

"Were the silver prints produced thirty and more years ago more permanent than those made now? If so, why?"

Mr. Foxlee mentioned Mr. Willat's album of prints, made in the early forties, and said that in this were several prints as good now as when made.

Mr. Bridge dwelt upon the advantages of the early papers in their heavier salting and silvering.

The questions of the paper now supplied, and the albumenising, were considered in relation to permanence, but no finality was arrived at in regard to the question.

Croydon Camera Club.—The main subject on Wednesday 13th, was an address and discussion about the late exhibition. This was opened by the President, his remarks being illustrated by a set of lantern slides picturing the entire exhibition in the art gallery, which had been prepared by Councillor Noaks. Mr. Maclean began by stating that according to all opinions which had reached him the exhibition was considered to be a distinct success, creditable alike to the club and to the town. He also alluded to the popularity of the oxy-magnesium lamp, in connexion with which he handed round a number of cabinet portraits taken with the lamp at the exhibition by Messrs. Bender and Lewis, Barker and Price, and Mr. Glanville. Proceeding to talk of other matters, he amused the audience by relating a few contradictory criticisms which had come to his ears. Thus while one complained that many of the best pictures had been "skied," "floored," or "cornered," another found fault because all the best pictures monopolised the best places, thereby making the second best look worse than ever. As a commentary on both he would only say that medals had been awarded to prints which were either skied, floored, or cornered. "Should judges rob a member of his medal?" opened up a lively discussion. The President stated that he felt nothing but gratitude to the able gentlemen who judged their exhibition, but some there were who wished that it was obligatory to award all the medals in the members' classes. The more so that on the present occasion many visitors possessing art training considered several works in Class A more noteworthy from the pictorial standpoint than the one which received the bronze medal. Of course he (the President) would not for a moment suggest that a professional artist was as good a judge of pictorialism as is a first-class photographer. (Laughter.) So he gave for what it was worth the opinion of a well-known and highly-esteemed successful landscape painter, who, for his own satisfaction, had marked in a catalogue the works he approved. From this it would appear that the first choice for landscape in the whole collection was given to No. 8, "On River Nith," by Mr. P. H. Ridge. Besides the above in Class A, the following were commended: (14) "Requiem" (Kough) (19) "Clearing up" (Rogers), (32) "Deep in the Forest" (Hawkins), (49) "Group of Firs" (Jenkins)). It is impossible to continue the President's citations right through the exhibition, but enough to indicate that some people think better of the display than did the judges. Amongst the suggestions for future occasions the President thought that the general adaption of a rule that bronze, silver, and gold medals should represent three distinct standards of excellence, and not, as now, be meaningless, would be advantageous. At present, one might gain a silver medal in a members' class, while another exhibitor might get for a far superior work in an open class only a bronze medal. After the above a lively—almost breezy—discussion ensued, Messrs. Batty, Rogers, Salt, Wratten, Noaks, Kough, Irving, Watson, and others participating. A strong feeling was expressed that, so far as members' classes were concerned, it was extremely harmful to the club that the medals were withhol The idea to be aimed at in medal-giving should be, in the opinion o meeting, to indicate who is the best worker in the club—not i world—and not to indicate that the best worker has attained to unfixed ideal of excellence. It was announced that the annual rum sale will be held on the 27th, and the annual dinner on Saturday, 30. The Easter excursion will be to Horsham, when it is hoped th may be found possible to visit Sir Edmund Giles Loder's famous collection of plants and animals at Leonardslea.

Leicester Literary and Philosophical Society (Section G).—Marc —Gaslight printing was demonstrated by Mr. J. Porritt, who en sized the ease of manipulation and softness of results obtained by process. Excellent lantern slides of the Belgian Ardennes exhibited by Mr. G. Bankart, and slides of Ilfracombe by Mr. F Rowley, F.R.M.S. Officers for the season 1901-2 were also elected.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No n is taken of communications unless the names and addresses of the writer given.*

*** *We do not undertake responsibility for the opinions expressed by correspondents.*

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—It is surprising with what a show of unanimity correspondents, thirteen years after the principle of colour-c analysis was published and demonstrated by the first successfu production of colours, now condemn it as not only a false princ but as a retrograde step from methods which were then acknowle failures. But not the least surprising and significant part of i is that no two of these writers lay down the same law; in fact, do not agree with each other any better than they do with me v it comes to proposing a substitute for colour-curve analysis.

Mr. Farmer states as a fundamental principle the use of " colour" screens for analysis, and then seeks to prove his case reference to a set of "curves" which out-Maxwell Maxwell hi for "impurity" in one case, and groups of spectrum rays represen the entire spectrum cut into three parts in another, with no sug tion of measurements based upon mixtures of reproduction colo but even Mr. Farmer admits that the colour-curve analysis is co for positive synthesis, which was the only kind of synthesis prop by Maxwell, one of Mr. Farmer's authorities for condemning col curve analysis!

Du Hauron, as I have shown in my previous letters, certainly not advocate definitely any one of the kinds of colour analysis w are under discussion, and I think it is pretty clear that for nega synthesis (colour printing) he proposed as the correct principle making of the negatives by the "primary colours" taken two two; at any rate, Professor J. Stewart Gibson, as recently as in (THE BRITISH JOURNAL OF PHOTOGRAPHY, page 362), insists that is the correct and only rational procedure. He says, "Each neg is produced by the action of white light minus that particular c which is printed by it." He says it is an "error" to make negative which prints yellow by the action of blue alone, instea blue+red.

Mr. Tallent evidently does not hold with any of these, bec he would work out curves by actual measurements of mixture "suitably chosen" reproduction colours, which is what I prop in February, 1888.

Now, it is obvious that of so many different procedures, not m than one, if any, can be quite correct; there is a lot of rub somewhere! But it appears that we have not even yet come the end of the distinctive methods. Mr. E. D. Fawcett (page suggests that, because some kromskop landscapes that he has do not please him, colour-curve analysis is proved to be wrong for positive synthesis, and he apparently has no doubt that Farmer's plan of taking the spectrum rays in chunks would rem the defect. I wonder, if he had a mirror which was imper in polish, would he try to improve it by rubbing with sandpaper?

Anyhow, we are at last making a little progress in understand It is not very long ago that most of the writers upon this sub (Vogel, Vidal, and many others) had not reached the point of se any difference whatever between my methods and those of Du Hau When everybody comprehends the essential differences in all of t procedures, we can discuss them to some purpose.

To come back to the subject of kromskop landscapes, the fact as I have often pointed out, that landscapes are often difficult subje because they present to the eye a scale of gradation of light shade far too long to be successfully recorded or represented by photographic process, quite irrespective of any question of co analysis. When we can preserve by photography the correct gra tions of light and shade of a white marble monument in burning s

ght by the side of deep shadows under dark foliage (both of which ıe eye sees perfectly), then we can make landscape chromograms hich, when sufficiently brilliantly illuminated in the kromskop, will ılly satisfy the eye. As it is, something is lost at both ends of the ɔale, and colour contrasts are apt to be exaggerated in the middle ıades. The colour analysis that Mr. Fawcett would substitute for olour-curve analysis would not in the least mitigate this evil, but ould introduce new ones. But is this evil so great as Mr. Fawcett aints it? I am sure I could show him a great many landscape reroductions in the kromskop which are incomparably more true to ature than anything which the hand of man ever produced—reproıctions so beautiful that some people will sit by the hour enjoying ıem, and would laugh at Mr. Fawcett's criticism.

The plan of coating the "Joly-MacDonough" screens with sensiive emulsion and developing the pictures as direct positives is not ew. I have discussed it with several people in years past, and, hile I cannot at the moment give a reference to prove it, I believe has been published. Joly, in his original patent (1894) (?), made uggestions which so closely touch this method on all sides as to ıake it seem probable that nothing but his recognition of the necesity for using colour-curve analysis and pure colour synthesis preented him from stating it as one of his alternative procedures. he difficulty about difference of analysis and synthesis colours could e got over by ruling the lines in the colours required for coloururve analysis, and covering the finished picture with a varnish conaining two narrow-band dye colours to cut out the intermediate pectrum rays. There are other obvious difficulties which could by ıo means be so readily disposed of.—I am, yours, &c.,

Philadelphia, March 4, 1901. F. E. Ives.

THE MASTER PHOTOGRAPHERS' ASSOCIATION.

To the Editors.

Gentlemen,—Re your invitation to photographers. I am very leased with the idea, but we must not lose sight of other important natters by getting over-excited by the Ogden-Lever affair. My dea would be to form a proper commercial association, composed nly of photographers, printers, and enlargers. The door should be losed against manufacturers, dealers, employees, and amateurs. It hould be a national affair, with centre in London and provincial ranches as may be found necessary. It should be the association's usiness to protect professional interests, and also to improve them y any means that may be found necessary. This would give us what s wanted, but it would be worse than useless if the parties named bove as undesirables were admitted, as their interests and ours are ıot always identical.

I hope that such an association, or one on better lines, may be formed and fully supported.—I am, yours, &c., Walker.

London, March 16, 1901.

To the Editors.

Gentlemen,—I desire to add my support to an organization for the protection of our profession, although I can form but a dim idea how far it may be successful in bringing pressure to bear upon the firms that choose to flood the country with cheap copies of honest original work, as is being done by Messrs. Ogden and Lever, whose new system of making their goods more popular is doing much to cut the ground from under the feet of the already struggling photographer.

I am, however, inclined to favour the idea of persuasion rather than coercion. Either of the above firms, it must be understood, are big enough to snap their fingers at any manufacturers of plates, papers, or chemicals, and it would not be unreasonable to suppose that they could produce their own photographic materials, and there is no need for them to be dependent on the English market for the raw material.

Further, if all the photographers in the United Kingdom decided to a man not to use any goods whatever turned out by these firms, what would it avail? A few thousand consumers of a particular soap or cigarette, more or less, would be but a drop in a bucket, so gigantic are both these concerns against which we would wage war, so that boycotting seems to me to be out of the question, while it is wrong in principle, undignified, and degrading in the extreme, and two wrongs will never make a right. In the face of this, I would suggest that before any strong measures are resorted to, that an appeal should be made to these firms, say, either from the office of The British Journal of Photography, or from a committee of photographers, who should voice the feeling of the trade. If these men are aproached in a fair and proper way, they may be induced to listen to reason. It is just possible that neither of these firms realise to what extent their present system may tend to wreck the only means whereby hundreds and thousands of men and women obtain their daily bread. Such an appeal as I suggest could be made within a very short space of time, and time is of the greatest importance.

Messrs. Ogden and Lever have long had the unstinted support of the British public, and they may be made to see that they have taken a wrong step if they wish for a continuance of that support. Judging by the correspondence published in last week's Journal between Messrs. Newton and Messrs. Lever, one of the two firms at least is ready to listen to reason, and has given a courteous reply to a courteous letter re the matter of permanent cabinet photographs, and I have every reason to believe they would give a businesslike reply to an appeal from the photographers of the country. Meanwhile organize.—I am, yours, &c., F. H. Sanderson.

Firenze, Cambridge.

AN ASSISTANT'S SUGGESTION.

To the Editors.

Gentlemen,—Having followed the Ogden-Lever discussion with much interest, may I express the hope that any combined action which may be taken in the matter will be so organized as to give assistants an opportunity to give it their support? I should be glad to become a member of such an organization, and a friend who is engaged in the same establishment as myself would also join. I should think many other assistants would be glad to do so, as it is obviously equally to the advantage of employer and employee to maintain a high standard in the profession. I enclose my card.—I am, yours, &c., Assistant.

THE OGDEN-LEVER PHOTOGRAPHS.

To the Editors.

Gentlemen,—As a representative of an Irish firm of photographers, I have been somewhat interested in the various letters which have appeared in The British Journal of Photography on the subject of the Ogden-Lever incursion. I notice, however, there is an absence of correspondence from most of the leading firms in London and other large towns, and would like to know if this is owing to apathy on the part of our leading lights, or is it from the fact that it would look undignified on the part of photographers with a fashionable connexion showing sympathy with a cause which might indicate that their business was of such a standard as might be affected by this advertisement scare?

Now, Mr. Editor, if we have a grievance, and I believe we have, it must affect directly or indirectly all photographers whatever grade of life they are in, and, if we are to find a remedy, be it association or other means, it must be unanimous. If we are to have an association, then, let us associate by all means, but if we are to have any voice and weight in the commercial world it must be representative, and you, Mr. Editor, are quite right in taking no practical steps in the matter until it is clamoured for by a fair majority of the people who are to be benefited by the organization.

As hinted above, there are photographers whose business is of such a nature that they can afford to look complacently on the cause of this alarm, but I contend there are other grievances incidental to the profession besides this "bogey," which an association of this nature could combat with benefit to all classes, and for this reason all photographers should join and make it a power in the profession.

From the foregoing it is patent the writer is in favour of an association, and the lines they should work on can be left for future discussion, but, in conclusion, I would emphasise a former remark, it must be unanimous. Shamrock.

THE OGDEN-LEVER INVASION.

To the Editors.

Gentlemen,—Do you not think that Messrs. Ogden, Lever, and Co. will soon hang themselves with their own rope? "Good wine needs no bush." It reminds me of my childhood's days, when a spoonful of jam was offered to induce me to swallow a nauseous dose. I would suggest that all photographers should agree to raise the price of pictures—when only one is required.—I am, yours, &c., F.

March 13, 1901.

RE COUPON PHOTOGRAPHY.

To the Editors.

Gentlemen,—We would like to state that we are still in correspondence with Messrs. Lever Bros. on the above subject, and have every reason to believe that we shall succeed in getting them to take our view of the matter. We will not encroach on your valuable space with the correspondence at present, feeling sure that should we think it necessary to do so later on you will be able

to spare us the necessary room. We are in hopes of receiving from Messrs. Lever Bros. at an early date an undertaking that the productions advertised by them will be properly described at least.—We are, yours, &c., Pro Newton and Co., H. W. Newton.

19 and 21, Fife-road, Kingston, S.W., March 18, 1901.

RE "SMOKE AND BUBBLES" INVASION.

To the Editors.

Gentlemen,—Photographers of all classes—professionals, of course—are greatly indebted to you for the generous publicity you are giving this, their latest and perhaps greatest, grievance. If, as a result of this correspondence in your columns, a trade protection society is called into existence, you will not, I am sure, begrudge the space accorded to this matter. Such a society is eminently needed, and photographers are woefully belated in being without such means to an end at this advanced period of their history.

On the axiom that an ounce of practice is better than a pound of precept, your correspondent's offer of three guineas towards the initial expense of such a society is worthy, not only of paper commendation, but practical imitation!

I shall be pleased to second his offer with one of two guineas as the first year's membership subscription to an approved organization for safeguarding our imperilled rights. Will some well-known London professional be public spirited enough to act as Secretary pro tem. to receive and record names, and, in general, make all arrangements for calling the prospective members together?

Better still, Sir, if you will consent to be "stakeholder" in the venture until the embryo society can boast "a local habitation and a name." In the meantime, as a matter of principle, let there be, on the part of photographers and all they can influence, an absolute boycott of all those firms who have to fall back upon the adventitious aids of cheap pictures to advertise their wares.

Some object to this modus operandi as undignified. If so, what about the action of these combines in abusing their vast capital in unfair competition to undersell and degrade an honourable profession? Let the voice of our protest and indignation reach the ears of Messrs. Ogden and Lever, and see that the agitation they have brought about does not die down with only verbal vapouring; rather let us repair the breach in our walls for the next onslaught on our prerogatives.

The suggestion of a black list of those dealers who supply the paper, &c., to these firms, and those who lower the status of the profession by aiding in any way this reactionary enterprise is one which, I hope, will be adopted.

By that means we shall know who's who, and the information will be edifying reading. I enclose my card, and add (as I could wish all your correspondents would) my full name and address.—I am, yours, &c., L. H. Greenway.

27, Abington-street, Northampton.

[We repeat the announcement, made elsewhere, that a meeting to consider the advisability of forming a professional photographic association will be held on Thursday evening next, March 28, at 8 o'clock, at Anderton's Hotel, Fleet-street, London. All professional photographers are invited.—Eds. *B. J. P.*]

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Carbon Printing.— G. L. Lea writes: "I saw in the Journal some time back particulars of, and a picture of an arrangement in the form of a wall-bracket for heating water for carbon printing, and should be glad if you could put me into communication with the maker."—In reply: Address Messrs. Fletcher, Warrington.

L. M. P.—(1) We know nothing of the firm; better demand the return of the negatives under threat of legal proceedings. (2) Yes, if your camera will close up short enough, though, being of the whole-plate size, we doubt if it will. (3) About two and a half inches we think. (4) It may be applied by stumping or by hatching, according to the effect desired.

Wm. Mitchell.—Scarcely up to exhibition standard. You had be procure and study some little book on the principles of composit The little view you send is pretty, but very conventional in sub and selection.

Depth of Focus.—"Amateur" asks: "Will you kindly recommend a reliable book on depth of focus?"—In reply: No such bool specially devoted to the subject, but the late J. Traill Taylor in "Optics of Photography and Photographic Lenses" (publis by Whittaker and Co.), fully explains the meaning of the term.

Mounts.—H. A. George writes: "Would you kindly inform me in y next issue where I can procure Christmas and birthday ph mounts? Can you give me the name of some German imp houses in London?"—In reply: Retail houses are of no Marion's, Houghton's, Fallowfield's, &c., are wholesale hous as well as retail ones, and they will give you wholesale terms if purchase in wholesale quantities. They are the importers of foreign goods they sell.

Optical and Chemical Focus.—W. Walker writes: "Will you kin inform me the difference between optical and chemical focus? In reply: In a well corrected photographic lens—as all mod lenses are—there is no difference in the optical and chemi foci, as they are both coincident. In an unachromatised l they are not; consequently, when the image is focussed shar (visually), the lens is out of focus chemically, and a sharp pict will not be obtained unless the plate be afterwards adjusted to chemical focus.

An Operator's Question.—"Senlac" writes: I am sending herewith specimen of my operating and retouching, and would like to h your opinion on it, as it is a fair specimen of my average wo Also, what salary do you think I should expect (I have had eig years' experience, including a four years' apprenticeship)? I asking this question, as I seem to have so much difficulty in obta ing a berth, though my references are satisfactory, and I am capable and conscientious worker."—In reply: For work of t class, which is of the average commercial kind, our corresponde might expect a salary of £2 2s. per week.

Books on the Carbon Process.—T. D. Mackenzie, jun., writes: "Ple give the names of two or three of the best books on the carb process, other than the Autotype Company's Manual. Is th one that goes fully into the theory of the process and one, or t same, treating fully the making of positives for reproduci negatives, &c., and also of such points as control in printing, &c. In reply: There is Wall's work on the process which may be h through any of the dealers. One number of "Photo-Miniature" devoted to carbon printing. It may be had from Dawbarn a Ward, Farringdon-avenue, E.C. Elliott and Son, Barnet, al have a pamphlet on the process. All these works, like the "Aut type Manual," deal with the subjects you desire information upo

Daguerreotype Plates.—Mrs. Rejlander, of 18, Colls-road, Peckha S.E., writes: "In last week's Journal, I see an answer to one your correspondents, inquiring for some Daguerreotype plates. have a small mahogany box containing sixteen silver-plated copp plates, which have never been used, they are stamped with a tra mark at corners, with a lamb and flag, and the figure 30, and st sizes, 4 of $3\frac{1}{4}\times2\frac{3}{4}$, 12 of $3\times2\frac{1}{4}$. Your correspondent can have the for 10s. I have been informed that the R. P. S. are collecting curi of the old days, if this is so, had I not better submit them to t society in preference to your correspondent?"—In reply: We a not certain that the society would purchase the Daguerreoty plates, but let our correspondent address the Secretary, at Russell-square, W.C.

The McDonough Joly Process.—"Colonel" writes: "The Journal January 18 contains a very interesting article by Mr. Arth V. Kenah, 'On a method of producing photographs in colour suitab to the requirements of the amateur.' The article is free from tec nicalities, and the theory on which the method is founded is e plained with much clearness and perspicuity. A further article promised, 'On the practical working of the process,' and man amateurs, like myself, who are anxious to test the process, woul be glad to know when this article is likely to appear, and whe the screens and plates are likely to be placed on the market?" In reply: The article may not appear for some weeks or month We are informed that the screens and plates are not yet ready f commercial introduction.

A Stereoscopic Puzzle.—W. L. writes: "I enclose prints from tw stereoscopic negatives handed me by a friend. In the one case house and telephone post are included in the left view which ar not in the right; and in the other view, at the top right-han corner, is a piece of road not to be found in the companion pictur on the plate, while a telephone post occurs in the left, but not i the right. I understand the views were taken with the front o the lens removed and the camera racked out accordingly. Th division in the camera would, possibly, not reach out to the fron They are both taken from near the same position. Kindly sugges explanation."—In reply: The only suggestion we can offer is that ther are one or more small orifices in the camera somewhere, possibly i the bellows, that have acted the part of a pin-hole camera—thu producing the secondary images. It will be noticed that in eac case these are of very bright objects. If the camera be carefull examined in a strong light, with the bellows fully extended, w have little doubt but that they will be detected.

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EX CATHEDRÂ.

Photographic Education.

We have recently been the recipients of a complaint from a provincial professional photographer, which sheds a strong light on a recent discussion in these pages. The complaint was the difficulty in getting an operator with any practical acquaintance with the powers and uses of lenses. "I have many cameras and a large battery of lenses and adapters, enabling any one to be used on any camera; but when a certain class of work has to be done of a particular size, my experience is that the men are usually quite at sea as to which lenses to take away for the job; and as to their capabilities or special adaptability for particular work, I find crass ignorance prevails. One man, for example, took a 10 in. focus lens for a whole-plate camera because it was a 'wide-angle lens,' while as to selecting a lens for use in a copying and enlarging camera, with a rather limited range of extension, they are unable to do it, and have more than once come to me to say they cannot make an enlargement of named proportions with the lenses at command." We have every reason to believe that this ignorance is by no means uncommon. To many photographers the difficulty will appear fanciful—men whose work is mainly portraiture, and whose aim is artistic effect. But there are beyond these a large number of business men who aim in their own studios to do a great variety of photographic work, and to do it all on the premises. It is such workers as these who feel the pinch of lack of knowledge or training in their assistants. Again, these assistants will, presumably, become principals themselves some day, and, with such a lack of knowledge, will be at the mercy of their dealers when setting up a new outfit of lenses for their own use; they will buy wide-angle and narrow-angle lenses, and be unable to get proper value from them, and, altogether lock up useful capital because, in fact, they do not know their business. The question arises, "How is this difficulty to be surmounted?" Obviously, by exterior technological training. The City and Guilds of London Institute have instituted examinations in photography, to test the capability of candidates in this particular direction and others, and classes have been formed under its ægis throughout the country. The point that has been raised is as to whether the students are expected to possess a greater knowledge than is desirable. An unprejudiced perusal of the questions put can scarcely lead to any other conclusion than that a good "all-round operator" ought to be able to answer them.

* * *

The Value of Technological Training.

So far, we are discussing the subject from a very low plane, and we shall not be blamed for pointing out that the general tendency—a tardy one, it is true—of the educational work of the time is by means of what may be termed technological education, as opposed to technical, which too often means rule of thumb, to educate the student beyond the point of training him to attain skill in a particular handicraft. He must be taught to think, and to raise himself above the level of a mere user of tools. Photography, it is true, is a very specialised handicraft, and its aims are in the direction of art, but its practice is governed by scientific principles, and if a young photographer is not grounded in these principles, optical and chemical, he is only a craftsman, and one with an incomplete knowledge of his business. The founding of these

photographic classes, and the institution of examinations to test the grounding in accurate knowledge, form a valuable means of improving the average of ability, and it would be a thousand pities to cramp their usefulness by reducing them simply to classes for imparting such instruction only as could be gained by the ordinary training of a studio. Why, for example, is so large a proportion of mechanical photography ordered in this country sent to Germany for execution? Is it not that, through superior technological training, the German "operator" can more readily grasp the necessities of the work, and more quickly attain proficiency? We have of late heard, ad nauseam, how this class of training is available in Germany. Last September, Prof. Carhardt read a paper to the American Institution of Electrical Engineers, in which he said: "If England is losing her supremacy in manufactures and commerce, as many claim, it is because of English conservatism and the failure to utilise to the fullest extent the lessons taught by science." This, of course, was a talk to engineers, but the principle is applicable to all professions, and photography, beyond many, has risen to its present height from a garnering and utilisation of the facts of scientific investigation and experiment. It is education, besides instruction, that should be aimed at in a photographic teaching class, and a perusal of the syllabus of the examinations to be held will scarcely justify any one in complaining of its scope. It cannot be said that the questions hitherto put are outside that scope.

* * *

Scientific Education in Photography.

There is another aspect of the question to be dealt with. Examinations, it is admitted, are Chinese in principle, and are not adapted to ascertain the real state of a candidate's knowledge; but we must take them as we find them, in default of a better system. In the particular examinations we speak of, there must be noted the following rule, given, too, in italics:—"No candidate will be admitted to the Written Examination who has not previously passed the Practical Examination." This should form an excellent safeguard against a pass from mere book knowledge. A writer in "Nature," complaining of the questions set in elementary experimental science of the Cambridge Local Examinations, said:—"The way to answer them is to waste no time on experiments, but read up your formulæ and work examples." The City and Guilds questions, as published, appear to us to be founded on different principles, and to require practical as well as theoretical acquaintance with the subject before success can be obtained. We should like to conclude our already lengthy remarks by quoting from Professor W. Rippers, of University College, Sheffield, from an address he delivered early last year:—"Every teacher who has had experience with the teaching of science to boys knows that the class consists of two distinct types; first, those who are fitted by careful training to become successful students, and to take a more or less high position in public examinations, who, in fact, are aiming at passing some examination as a means for their future progress; and, secondly, those who have no prospect of such success, and whose future success will depend, if they succeed at all, upon other qualifications." En parenthèse, it may be said that the photographic students are not all boys. All the more need then for them to have scientific education, for surely photographic classes are not formed for substituting professional instruction in lieu of what is practically apprenticeship. Finally, let us say, we have pointed out the restrictions placed in the way of getting a pass for mere book learning, and we have only further to remark that a careful perusal of the questions that have been put in past examinations will not justify a charge that there is in them a preponderance of pure science.

* * *

Sale of Poisons for Photographic Purposes.

The Pharmaceutical Society of Ireland seem, like the Pharmaceutical Society, to be actively engaged in defending their monopoly in the sale of poisons used in photography, unless they are vended by members of their own body. In one of the Dublin police courts, on March 8, three dealers in photographic materials—Messrs. Lafayette, Laffan, and Smyth—were proceeded against by the Pharmaceutical Society of Ireland for selling oxalate of potash and sulphocyanide of ammonium, they not being qualified under the Act to do so. The offence was admitted, and in the case of Mr. Laffan fines of five pounds, in each case, were inflicted. In the other cases judgment was reserved by the Court to see if it had the power to mitigate the penalty. Evidently in Ireland, as well as in England, it will probably be a surprise to many dealers and users of oxalate of potash to hear that it is a poison within the meaning of the Act. In the Act of 1868 it is not scheduled, though oxalic acid is. None of the oxalates are, although, in the case of cyanides, "all metallic cyanides" are included. But the Act of 1868 does not apply to Ireland. We have not the Act of 1875, for Ireland, before us just now, under which these proceedings were taken. All dealers in photographic materials may not be aware that there is in existence "The Traders in Poisons or Poisonous Compounds for technical or trade purposes Protection Society," which is promoting a Bill for permitting the sale of such poisonous substances as are used, for trade or technical purposes, by others than pharmaceutical chemists, under certain restrictions, and we suggest that all sellers and users of photographic chemicals should give it active support, and thus help to destroy the monopoly possessed by the pharmaceutical body. Photographic dealers, oilmen, and others are quite as capable of fulfilling the requirements of the Poisons Act, so far as the materials used for technical and trade purposes are concerned, as the pharmaceutical chemist is. They can duly label them as "poison," and make entry in a book kept for the purpose, as laid down by the Act. The purchaser would then obtain what he requires at a moderate price, and not have to pay the fancy prices he often now has to do at the druggist's—sometimes for materials inferior, for his purpose. It may be mentioned that, after many years' endeavouring, the Pharmaceutical Society has now obtained for its body a monopoly in the sale of carbolic acid, and now, instead of going to the oilman's for it at a few pence per pint, for disinfecting purposes, one has to go to the druggist's, and pay a comparatively exorbitant price for the same thing.

* * *

The Pharmaceutical Society and the Act.

When the administration of the Act of 1868 was placed in the hands of the Pharmaceutical Society it was with the idea that it would safeguard the public. How does it do it? Merely by proceeding against any one

ho sells, say, a little bichloride of mercury, sulpho-anide of ammonium, or, as in Dublin, oxalate of potash r photographic purposes, for the five pounds penalty, hich goes into its pocket, instead of looking after the eep in its own fold. It is notorious that the greatest in-ingers of the Poisons Act are pharmaceutical chemists, d whoever heard of it prosecuting one of its own body? ere is an example. A few years ago a well-known firm oilmen were fined five pounds for selling fly-papers be-cause they contained arsenic. According to the Poisons ct, arsenic, or its preparations, can only be sold by armaceutical chemists, and the name of the seller with e word "poison" must be on the package. In the case this, and other things, which are included in the first rt of schedule "A," it is unlawful to sell it to "any rson unknown to the seller, unless introduced by some rson known to the seller, and on every sale of any such ticle the seller shall, before delivery, make, or cause to made, an entry in a book to be kept for the purpose . . date of the sale, the name and address of the pur-aser, the name and quantity of the article sold, and the rpose for which it is stated by the purchaser to be re-ired, to which entry the signature of the purchaser and the person, if any, who introduced him shall be affixed." that always done? We have frequently bought fly-pers at the chemist's where we were unknown, no ques-ns were asked, and no formalities gone through. The ly difference between the transaction at the oilshop and e chemist's was that at the latter we were charged a nny each for the papers, whereas at the oilman's we had e same maker's article for sixpence the dozen. Many rchasers of photographic chemicals have had a similar perience with what they required. By the way, the armaceutical chemists are sometimes proceeded against, t by the Society, however, but by the official who looks er the purity of our butter, coffee, and the like. At e Sheffield Police Court, about a fortnight ago, three mists were proceeded against under the Food and Drugs t, and fined. The Medical Officer, it seems, wrote out ee prescriptions, each containing ninety grains of sul-ate of quinine and 120 grains of citric acid in the mix-e. On analysis one mixture was found to contain only 6 grains of quinine and 82.4 of citric acid; another 64 ins of quinine and 122.4 of citric acid; while the third tained 116 grains of quinine and 190 grains of citric d. Many will think that the Pharmaceutical Society uld be better employed, and prove a greater safeguard he public, in looking after such matters as the dispensing prescriptions—upon the accuracy of which life may end—than in harassing photographic dealers and like for their five pounds. It is to be hoped that the ders in Poisons and Poisonous Compounds for techni- or trade purposes Protection Society will meet with ry support, and that its proposed Bill will be passed. ere is little doubt that every representative photo-phic association will give every support to it in its own erests.

* * *

Copyright nt. From a report of the meeting of the Photographic Club, in our last issue, it will be iced that a somewhat interesting question was put by one he members, which we here quote:—"If a customer in-ms you when he wants a picture copied that it was taken at his own cost, or that it was taken by a friend whose permission he has to have it copied, does that or any similar statement exonerate the man who copied it from responsibility in case of infringement of copyright?" The general opinion of those present was that it did not, although he might possibly have a right of action against the one who made the statement. This seems to us to be a correct reading of the law. The one making the copy must make sure that the picture is not copyright, or take the consequences upon himself. By the wording of the question, it seems to be suggestive of the forms to be filled up by those who send a certain number of coupons and half a crown to the tobacco people for a dozen copies of portraits. Of course, if one of the portraits sent is copyright the ower of it can proceed against the firm for its infringement, notwithstanding the statement in the form; but it is probable that the firm may have a cause of action against the sender. For example, Smith takes a portrait of Brown, and makes it legally copyright. Then Brown sends it to Messrs. Smoke, Bubbles, and Co., with the filled-in form, and get his copies. Then Smith enters an action against the firm for infringement of his copyright. Will he gain his action? We should say that certainly he would. The firm might take action against Brown for misleading them, but possibly they might not be able to find him, or, if they did, he might not be "worth powder and shot." We have merely alluded to this matter to point out the risk every one incurs who copies pictures that he does not know the pedigree of.

* * *

A Variety Entertainment in Church. We have more than once alluded to the use that the Rev. W. Carlile, of St. Mary-at-Hill, makes of the lantern in his services. In a circular he has issued, he says that he has added to the attractions by the introduction of an electrophote, "which is the first of its kind," and a monsterphone, which conveys to the audience a sermon of two minutes' duration. In a leading article, Thursday last week, the "Standard" has some severe remarks on these services, which it characterises as "a variety entertainment, with snippets of sermons, songs, and biographs or similar music hall novelties." In a letter to the editor, two days later, the rev. gentleman protests against the article, and the "Standard" adds the following append to it:—"We willingly insert Mr. Carlile's letter, but we retain our opinion that it is not desirable in the interests of religion to turn the services of the Church into a kind of variety entertainment." Whatever may be thought, there is no question as to the, more or less, secular novelties that the Rev. Mr. Carlile introduces in his services, or, as the "Standard" terms them, entertainments. Some time ago one of the lantern shows was a prize fight, if we remember rightly, but, of course, that was simply to teach a moral.

THE KODAK COMPANY.

This week's meeting of the shareholders of Kodak, Limited, occurs, we are convinced, at a time when those interested in the fortunes of this great enterprise may reasonably regard its future with grave misgiving, unless some recent departures in policy that have been taken are carefully

reconsidered and modified. It is sixteen years since the Eastman Photographic Materials Company came to this country from America to engage in friendly competition with British manufacturers, and the history of its business, which has developed into the universally known Kodak, Limited, has been one of almost uninterrupted commercial success, and of conspicuous advantage to photography generally, no matter from what aspect the subject is viewed. Paper negative work, transferotype, bromide paper printing and enlarging, the roll-holder, rollable celluloid, and Kodak cameras have either been introduced or widely popularised by the successive companies that trace their place of English origin to Soho-square in the year 1885, and while this enlightened and well-timed appreciation of the needs of vast numbers of the public for the means of practising simplified photography has been rewarded by the most gratifying financial success, the effect upon all other branches of photography has undoubtedly been of a stimulating nature. It is indeed an astonishing evidence of the firm hold which photography has obtained upon the people of the world that the remarkable success of the Kodak Company has been accompanied by expansion in other branches of photographic industry such as were not thought probable a decade ago. The two things seem complementary the one to the other. Until quite recently we should have scouted the idea that the Kodak Company would voluntarily endanger the unique position which it has deservedly won by the aid of supreme technical skill and splendid business enterprise. But, to our surprise, and we will add regret, the security of that position has been shaken by the company's own act and deed. In effect, some thousands of firms who sell Kodaks have been told they must not supply any but Kodak rollable celluloid films for use in those cameras, and that a disregard of these conditions entails a suspension of the agency. All Kodak goods, or none. That, we believe, describes in as few words as possible, the attitude of the Kodak Company towards the photographic trade of this country. It is an attitude that has been taken up, it would appear, not without considerable deliberation and forethought; and, we have no doubt, with the laudable object of guarding the interests of the company's numerous shareholders.

This grave step of the Kodak Company is hard to justify, we think, on any ground, not excluding that of abstract business principles. It is a step which we urge the company, in its own immediate and future interests, to retrace with all possible speed. The bare legal right of a manufacturing firm to impose its own terms on its agents being conceded, the wisdom of a literal insistence on such a right is always open to doubt, and very seriously so in the present case. There is no blinking the fact that, although the season of the year, when the busiest sale of photographic supplies is about to open, is not favourable to active resistance in the majority of cases, hundreds, if not thousands, of photographic dealers will nourish a more or less secret resentment against the Kodak policy, and the practical outcome of that resentment may have the most disastrous effects on the future of the company. Already it is apparent that other film manufacturers have been stirred into the greatest activity; there are many clamours for Kodak "substitutes," and the promises of early competition from Germany and France. This state of things, which in some, but not all, respects, is intolerable and deplorable fr the general standpoint, and full of menace to Kodak, L could, and we hope will, be ended by a stroke of t pen. The very things the company must naturally anxious to obviate and avoid, viz., a far-reaching antipat to Kodak films, cameras, and papers, and the provocation a keen, if not ruinous, competition, must, it strikes follow the recently inaugurated policy as certainly as t night follows the day. They are inevitable. On the otl hand, the withdrawal of that policy and the prudent c servation of the great trade it has created will still enal Kodak, Limited, to hold the field as the premier house its kind, and to exist in harmony with its British compe tors, let them be plate, film, or paper makers; or inde any class of photographic manufacturers. There is ro for all.

We have intervened in this matter with some reluctan and only after representations had reached us from quart we hold in the highest respect, that the views of t Journal, whose relations with the Eastman Compan have been of an intimate and cordial character ever sin 1885, would have special weight with the present Kod board. We hope they will. It is neither our duty n our business, we hold, to interfere in disputes on terms trading that arise between manufacturers and distributo But there are exceptions to all rules, and a case of the ki now presents itself. Apart from the particular policy Kodak, Limited, there is the case of photography ge erally as affected by current happenings. The wholesa or retail trader in the majority of instances will be guid in his course by business expediency, and to offer him a other useful advice at this moment is a difficult, if not i possible, proceeding. Passing over the consumer, who at present unaffected, unless he permits himself to concei prejudices, there are the manufacturers, who, in some cas have been needlessly alarmed by the bogeys of "monopoly and extinction. These and other phases of the "crisis" c not call for serious discussion. We shall not return to th subject unless it is imperatively necessary, but in concl sion we desire again to suggest to the Kodak Compa that it will best consult its own interests and that photography at large, by retiring from a position whi places it in antagonism to the most cherished privilege British trade, that of freedom of contract. Althou there is so much credit due to the company for the in mense developments it has already promoted in man branches of photography the possibilities in front of it ar we believe, greater than ever they were; and, therefor we should be sorry to see any obstacle placed in the wa of its continued progress.

LAC VARNISH FOR GELATINE NEGATIVES.

In concluding the article on varnishes for gelatine neg tives (see page 132 ante) we mentioned that we should re vert to the subject again, and say something about lacs, an lac varnishes, for photographic purposes. There can be n question, all things considered, that for photographic nega tives, a good spirit varnish, having lac for its base, is one o the best that can be used. It is easily applied, dries at once has no offensive smell, and, what is of still greater impor tance, it forms one of the best protectives the gelatine film

1 have. There are several negative varnishes in the rket, and although lac is their base, they are not called the makers lac varnishes; they are all excellent—or all ıt we have tried have been—and we should therefore re-nmend the user to purchase them, as he may thereby en-'e having a satisfactory article, and the price is very sonable. Some, however, as a matter of economy, may efer to make their own, hence this article.

Shellac appears in the market in different forms, such as ck lac, seed lac, garnet, button, orange, and white lac. ith the exception of the two first-named, which are crude ms, the others differ only in colour. The garnet is the pest in colour, and the button and orange are lighter and, nsequently, make a paler solution. It does not always low, however, that the orange will form a paler solution n the button, though it looks lighter through its being thin scales, while the other is in thick flakes. We have l samples of thick button lac that, when dissolved, have lded lighter solution than other samples of the orange. hite lac—bleached lac—forms an almost colourless solu-n, and quite a colourless film, and it is for this reason that is generally employed for the commercial photographic rnishes.

Shellac, it should be mentioned, is a complex resin con-ning several distinct resinous bodies—as well as a waxy tter—some of which are soluble in alcohol while others e not, and it for this reason that a clear solution is not tained when lac is dissolved in spirit. We have, how-er, had a sample of bleached lac that was entirely soluble in rit, and gave a perfectly clear and transparent solution. was obtained in Germany and evidently, by treatment in bleaching, the insoluble portions had been removed. We ve, however, failed to obtain a similar sample of lac m any of the bleachers to whom we have applied for it in ndon.

Lac is bleached in different ways. One is by first dissolv-it in a hot aqueous solution of an alkali, and then passing lorine through it, when the resin separates in snow-like kes. Another method is to add to the hot aqueous solu-n one or other of the hypochlorites until it becomes colour-s, and afterwards precipitating the lac with an acid. It then washed with water to remove the acid and put into t water and kneaded into a lump, and then pulled into e skein-like masses it is met with in commerce. When eached lac has been long kept in a dry atmosphere it erishes," that is, it becomes brittle and, at the same time, soluble in spirit. But if it be kept moist, or in water, it ay be retained in good condition for a considerable period, ough it is always advisable to use it as fresh as possible. bleached lac is liable to become "perished" by keeping ere is, with some, a prejudice against its employment in a rnish. But it has been found that when once the lac has en dissolved in spirit, the film it yields does not become ittle, and that it is quite as durable as that of the un-eached resin. There is one precaution that should be ken in using bleached lac, namely, that it should be oken up and thoroughly dried before it is put into the irit, for it often holds, in its interstices, a considerable ount of water which, by diluting the spirit, retards its lubility, and yields a solution which sometimes is difficult clear either by filtration or subsidence.

Here is a formula for a good negative varnish that may relied upon.

Lac (bleached or unbleached)	½ pound,	or 250 grammes.
Mastic	1 ounce,	or 30 „
Spike oil of lavender	2 ounces,	or 60 „
Methylated alcohol (about) ..	½ gallon,	or 2 litres.

We say about these quantities of spirit, because some samples of lac yield more viscous solutions than others, but the quantities given will be found about the average required.

The solution of the resins will be facilitated by the addition of some coarsely powdered glass or clean sand, as it prevents the agglomeration of the resins as they soften in the spirit. When the resins are dissolved, the solution, for the reason given above, will be turbid and must be filtered, or it may be stood aside for a time when the insoluble portion will subside, and the clear part may be decanted. Heat will aid in the solution, and also in the subsidence, but it is not advisable to employ it, for then some of the objectionable constituents of the lac may get into the solution, which is undesirable. The spike oil is for the purpose of rendering the varnish tougher than would be the case with the resins alone. When white lac is used it should, as mentioned before, be freshly bleached, and, therefore, it is advisable to get it direct from a lac bleacher, or from where they have a quick sale for it, as then its freshness may the better be depended upon.

Having dealt with the varnish itself it may be well to say something about its application. The directions generally given are to warm the plate, pour on the varnish, drain back into the bottle and dry before the fire. This is quite right, but an additional practical hint or two may be useful to novices, and there are many, in varnishing negatives. In the first place, the gelatine film should be absolutely dry —desiccated before the varnish is applied—that is important. In warming the plate in the first instance it should only be made slightly warm, just sufficient to prevent the varnish chilling—say about the temperature of the back of the hand. The varnish will then flow more freely over the surface than if the negative were made hotter. After the surplus varnish has been drained off, the plate should be slowly heated until it becomes quite hot—as hot as the fingers can well bear—so as almost to melt the lac itself. When this is done a distinct odour of it will be recognised. When the negative has become perfectly cold it can be printed from at once, as the varnish will have become perfectly hard. Instead of draining the varnish back into the bottle from which it was poured, it is better to drain it off into another bottle, so that any particles of dust that may have got into it may be filtered out, or allowed to subside, before it is again used.

ON THINGS IN GENERAL.

I HAVE received a most flattering letter recently, but that is not the cause of my long silence—ill-health is the true reason. I am not naturally a proud man, but that the receipt of such a communication as the following would tend to make some people puffed up I feel quite sure. Here are the very words: "Dear Sir,—I propose publishing an illustrated article on your town in the forthcoming double Royal number, and am desirous of giving portraits and biographies of the artists of the town. I shall have much pleasure in including your worthy self if you will kindly make an appointment for any day, and allow me to send my representative (——— ———, the celebrated author) to take notes, &c. Your reply per return will be much esteemed by yours most sincerely, ——— ———." To see my name in print, and have my biography placed in the hands of the

British public, and perhaps be pointed out when I walked in the street as the "celebrated artist," that would be fame indeed! Yet I have not responded.

Perhaps the rôle of non-responding may be peculiar to the photographic mind, for I find a complaint from Messrs. Buchanan Wollaston & Co. that they cannot get a response from the Association of Manufacturers of Plates, Papers, and Films, as to what is their definition of a bonâ-fide dealer. Really, Messrs. Buchanan Wollaston & Co., do you not think that you are too exacting? You seem to think you are dealing with ordinary tradesmen or manufacturers. You quite ignore the fact that you are dealing with the representatives of an important section of plate, &c., makers, who represent a capital of millions of money. They have naturally more important business to transact than to reply to such trumpery queries as Messrs. Wollaston's. I have it on the best authority that they hold frequent meetings, as often indeed as once a month, when decisions are made as to permitting dealers to buy on trade terms, but is that any warrant for expecting the definition asked for? The Kodak Company or the Platinotype Company will tell you by return, or with a brief wait, whether they will supply, the one their cameras, or the other their papers, on trade terms; but then they are true monopolists; their goods are not made by other people; they can treat a genuine dealer as a dealer, and they take ordinary business steps to discover whether his dealing is bonâ-fide. If Messrs. Wollaston will take my advice, let them go hat in hand (I do not think it will be necessary to go on their hands and knees, but that the manner of their application influences the Association's decision I am in a position to assert positively), and plead their cause personally. Ask the Association to withdraw their boycott; but let them not forget that the mere fact that they may sell photographic materials largely has little or nothing to do with their being placed on the list of authorised purchasers. The plate-makers who are still left in the Association are a portion of those who have made the name of British plates famous throughout the world—all praise to them for that! They appear, too, to be smart business men. But British manufacturers have, as every one knows, on previous occasions not been smart enough to prevent the foreigners usurping their trade, and making the creators of an industry take a very back seat. It would appear as if something of the sort was now taking place. A straw shows which way the wind blows. One of the most popular lantern slides now on sale in this country is certainly of foreign make, and reading the other day the advertisement pages of this JOURNAL, I find another Continental plate-making company, who are founding an American company, give two and a half millions of plates as their output last year—a sevenfold increase of the amount they turned out a decade ago, and resulting in a dividend of forty per cent. How is this to be accounted for? Messrs. Wollaston assert they have no difficulty in buying from several places plates at wholesale prices; others perhaps are less slim, and a feeling of pique at what they actually call injustice may induce them to push foreign plates, and it is evident that a dealer can do much in influencing a customer as to the brand he will purchase. Up to a comparatively recent time the dealing has mostly been carried on by the local chemist, and the Editors have often given their views upon the matter. A change is now taking place, and eventually the dealing will, in all probability, gradually fall into the hands of the professional photographer, who all over the country is seeing his legitimate business decline, and must perforce take up dealing. Some of the wiser heads have already done so: one of the largest and most aristocratic businesses in the country, having many branches, has for some time past gone in for dealing in materials at their headquarters studio, and we may expect others to follow suit.

Photography has been of such marvellous growth that ordinary business rules cannot always be applied to its practice; the amateur (who really has made photography) and the professional are mixed up in an extraordinary jumble. One would think that a professional photographer would not deal with an enlarging firm whose members treat with the general public, and perhaps send representatives to tout for professional work in the professional's own town and under his very nose. Yet one of the most popular enlarging firms in the country does this, and still the very men whose business they are injuring continue to send them negatives to enlarge.

Notwithstanding all this, which they do not cry out against, the are now raising a cry against the cigarette-makers for supplyi copies of their pictures at half-a-crown a dozen. I take it that the are heaps of photographers in the country who would be glad to g that price for carte-de-visite pictures even mounted on wide-marg cards. It is not to be supposed that I side with Messrs. Ogden a the rest in their latest anti-photographer dodge—far from it! I consid their conduct absolutely indefensible, and I should be pleased see them effectually checkmated. But how is it to be done in t face of such apathy, such crass indifference to their own interests I have just shown professional photographers to be guilty of? As matter of fact, the persons who would be content with such poor wo as "copies" must necessarily be, as compared with prints fro original negatives, are not the class who would bring much grist t the photographic mill—not the people who, to start with, would g to a photographer who charged much more than half-a-crown dozen. I predict a poor outcome of the offers; they will eventuall in all probability, turn out "much cry and little wool."

I notice a correspondent has been asking about dark chloride o gold; my advice to him is to have nothing to do with it. Th ordinary chloride, which is an acid salt of the terchloride, is now i such immense demand that it is made in very large quantities in clea uniform crystals, which can easily be rendered neutral in many ways A darker chloride has less acid in its composition; a neutral chlorid is usually an amorphous dark greenish-brown mass, which has n advantage over the neutralised acid chloride, is dearer in proportion and less uniform in composition, and necessarily less trustworthy as a marketable commodity.

In the report of the Royal Photographic Society meeting, on February 26, it is stated that Mr. Thorpe coats his diffraction gratings, copies of Rowland's, with a solution of celluloid in acetone. All I can say is that he is more fortunate than I have ever been in that direction. I have tried many samples of celluloid dissolved in acetone, but one and all they refused to dry bright, and left a surface more akin to "ground glass" than anything. Additions of other liquids to acetone will get rid of this effect, "but that is another story."

I have been following with interest the various remarks upon "hypo," which have recently appeared. I have been struck with the repetition of the assertion that hypo crystals are deliquescent. Let any one take a crystal of this salt and put it on a shelf on a piece of paper and leave it untouched for a year. The crystal will still be there with all its edges sharp and the whole practically unaltered in bulk. Under no definition of the word can deliquescence have come in. I look to the best authority I can find on my shelves, "Murray's New English Dictionary," and under the word "deliquescent," meaning—first (chemistry), "Having the property of becoming liquid by absorption of moisture from the air." I don't think a crystal the size of a boy's marble would become liquid if left untouched for a century. It is not deliquescent.

There has been some correspondence about conversion of grammes per litre into grains per ounce, &c. I take it that the rules for such conversion should be simple to work, easily understanded of the people. There have been, I believe, rules given in these pages for such conversion exactly or closely approximately performed and they may with advantage be here repeated:—

To reduce grains per ounce into grammes per litre: Multiply the grains by $2\frac{1}{4}$; the result will be correct to about $1\frac{2}{3}$ per cent., quite near enough for all practical purposes. To reduce ounces per pint to grammes per litre, add two ciphers to the number of ounces and divide by 2. This is exactly correct. FREE LANCE.

THE PHOTOGRAPHIC COPYRIGHT UNION.

I CANNOT refrain from adding my note of warning to photographers as to their danger in tacitly allowing the important opportunity to pass, when they may very powerfully influence the terms of the Copyright (Artistic) Bill, now before the House of Lords.

I grant that our time, as photographers, is usually pretty solidly occupied in bringing "grist to the mill," without meddling in extraneous matters. But these present proposed alterations in the

opyright law are no extraneous matters; they directly and vitally ffect the supply of this same hardly wrought-for "grist" in every ıse, even down to the humblest professional who struggles to make ı honest livelihood.

Are we taking heed of the signs of the times? Surely he who ıns may read, and read only too plainly of the very serious and very esent danger to both photography and every professional photo-rapher.

It is already old news to the public to be prolifically informed that ıey may have a very elaborate work of art reproduced from their hotograph, for a very inadequate number of shillings, by sending ıis photo and amount to certain firms for this purpose; again, some these latter-day grasp-all penny periodicals also extensively adver-se a similar offer; a cigarette firm is now proposing to reproduce hotographs sent to them; the Sunlight Soap Company advertise the roduction of *chef-d'œuvres* at about the cost of a bar of their own ɔmmodity; and I believe I am right in stating that a firm of tailors ffer to reproduce the photograph of each purchaser of a 5*s*. 11¾*d*. air of their all-wool, unshrinkable nether garments.

It requires no great flight of fancy to imagine that "a wash and rush up," with a reproduced photograph as an alternative to the ean collar, may be shortly negotiated for at strictly moderate and clusive terms; or, perhaps, a course of Packham's beef-steak ıddings, with a reproduced photograph of the attenuated client rior to the course, might appeal to Packham as possessing propiti-ing pecuniary possibilities.

But joking apart—if there be any joke in seeing an honourable rtistic profession going so rapidly to the dogs—is it not clear where l this is tending to? Photographers, high and lowly, will have ıeir best work reproduced broadcast more and more, and the public ill learn to know that they may have their photographs copied at ɔwer rates than photographers can do them at. At the same time, ıough, they may not also learn that this is because the latter dare ɔt turn out such rubbish as these people may do who depend on huge lvertisements, or who are only using photography as a lever for ther purposes.

I am not inclined to blame the poaching intruders on our hotographic preserves too much. If they are not over-stocked ith moral considerations, they, at least, can do these things and ill keep within the copyright laws of the country. But I cannot fficiently deprecate the lackadaisical, supine, invertebrate want of ɔmmon sense and energy which we, as a body, display in this utely serious question of Photographic Copyright—no less, indeed, ıan we do in most other matters which concern us collectively.

Imagine what an important and large body we photographers of reat Britain must be to-day, who stand by like a flock of insensate ıeep, while our copyright interests are played ducks and drakes with y these gentlemen of piratical proclivities, on the one hand, and, on ıe other, by a certain clique of painters meeting at St. John's Wood, ho while outwardly calm and superior, yet, I gather, are behind the ıe scenes displaying more energetic than dignified endeavours to eep us from that copyright protection which they are meanwhile ɔoking after very carefully for themselves.

We photographers are too much engaged in the narrow, if reason-bly necessary, act of providing for to-day, and in sighing over the ood old days, while, in the meantime, with suicidal indifference, we re allowing a prodigious selection of very choice evil days to store ıemselves up for us with much and certain prodigality.

This is certainly not the fault of the Photographers' Copyright Union and the Copyright Committee of the Royal Photographic ociety, who have combined in the interests of Photographic Copy-ght; nor of the Photographic Press, the editors of which have lluded as fully as they felt justified in doing to a subject apparently alling forth little response among their readers.

I question how many photographers even know that a Copyright Artistic) Bill of any kind affecting themselves is at present hatching ı some form or other in Parliament!

I waded through the text of this Bill as published in THE BRITISH OURNAL OF PHOTOGRAPHY on March 30 of last year, and amongst s ambiguity of legal language I was delighted to find, at least, it learly stated that:—

(1) "The owner for the time being of the negative shall be deemed to be the author;" and in another part it was also stated that "author means the painter, sculptor, engraver, or maker of an artistic work," and consequently means he is the owner of the copyright.

In a second special provision it was stated—

(2) "When a photograph is made of any person for valuable consideration, the owner of the copyright shall not, during the life of the person photographed, be entitled to sell or exhibit, without his consent, copies of this photograph, but, save as aforesaid, the owner of the copyright in a photograph may deal with his right of copyright without the consent of the owner of the photograph, or of any copy thereof."

Now, what can be done to quicken the narrow-minded, short-sighted people that we are to the fact that the whole remedy of our many grievances depends on whether or not we get this copyright protection in every negative we take, and which, as seen by the above quotation, has been already tentatively granted in the Copyright Bill?

If we obtain no such right to prevent the present advertising concerns, and whatever others may yet enlist, from despoiling us, then has photography, as a legitimate profession, received a very fatal blow.

Look at the impossibility of the position. There is too much keen commercialism about nowadays for this reproduction innovation to remain even in its present wretched stage. There can be no unbiassed doubt whatever that an artist who elects to express himself through photography, and thoroughly learns his profession, can produce art results; but what sensible person will become a student, or what present photographer is going to throw his best efforts into his work, when its very success makes the appropriation and loss more certain?

Mediocrity would become the greatest safeguard. It is an untenable position. Why, the St. John's Wood contingent, to be honest in their professions of fostering art, should be anxious to secure this protection to photography as a means of encouraging what even they might acknowledge to be its most pictorial side.

Can we, on the other hand, foresee how photography would be elevated as a soundly established art, if all the photographic emanations of our efforts and handicraft were protected just in the manner set forth in the clauses I have cited from the proposed Bill? Of course, no man would wish to publish without consent, from a negative taken on commission for monetary consideration; but think of the incentive to strive for higher results, and the additional allurement to other students to join its ranks, if photography had due protection instead of being in the present unstable, topsy-turvy position it now holds.

It was with these sentiments fully developed that I attended a meeting at the latter part of last year, convened to discuss the proposed Copyright Bill at the instigation, I believe, of the joint Copyright Committees of the Photographers' Copyright Union and the Royal Photographic Society. I have no doubt these two bodies would very fully notify photographers generally, as they did in my case, of the important nature of this meeting, yet there seemed few beyond their own members present.

I was greatly shocked to learn at the outset that this invaluable clause which I have quoted, giving photographers the copyright in all their negatives, had apparently been subsequently withdrawn from the Bill.

As far as I could gather, no one knew why or by whom this had been done. It was suggested that this same St. John's Wood "artistic coterie" were very equally busy between the two efforts of securing all possible preferments in their own section of the Bill, and in squeezing us out of their hallowed company. It seemed to me it would be better were these painters to be "minding their own business;" but, doubtless, they were well aware of how little we attended ourselves to our copyright affairs, and that small risk was incurred by their interference.

I could not learn who were the Promoters or Amenders of the Bill, beyond that it had been introduced into the House of Lords by Lord Monkswell. Nor could I ascertain whether any promoter was

interested on our behalf in the exclusion or retention of this particular clause, which, I consider, makes photography either an artistic profession or, viewed in the light of present events, allows it to become merely a scratch means of dubiously earning a precarious livelihood.

All credit is due for the important efforts made by the combined Copyright Committees; but what great weight can they bring to bear in face of the short-sighted indifference of photographers themselves as a body?

The Bill evidently had had the important clause in it of photographers holding this copyright in all negatives, and now it seems it has it not. The Bill is shortly expected to be brought before the House of Lords again, and to be passed into law. Then, unless we have meantime stirred in the matter, when it is too late there will be much "weeping and wailing and gnashing of teeth," as each photographer realises to what passes these unhealthy, increasing competitions and his own indifferent negligence have brought him.

Do you recognise, reader, that it is not the Copyright Committees who are responsible if this protection is lost to you?

It is entirely your own matter. Have you yourself individually thought or done anything in this your own concern of protecting yourself, save in claiming an odd half-guinea fee for reproduction of your work, which claim, by the way, the Copyright Union have made practicable?

Have you joined the Copyright Union? Do you think it fair to expect other people to attend to your affairs, and that too, without your even troubling so much as to give the organization the support of your name and interest? Just pause for a moment, amidst the narrow environment of your own daily set of affairs, and ask if you are being sensible to yourself in neglecting these broader rights of your profession.

Don't beg the question by thinking there are plenty of other people to do your business. That is being either lazy or mean, and, moreover, brings about the present neglected and lamentable condition of things.

On the other hand, it seems to me that we are not yet in such bad case, but that we can retrieve our position, if we first realise the urgency of the climax and determine that we will each one individually move in the matter.

In the first place, we have the machinery organized and at hand: the combined Photographers' Copyright Committees, whose very *raison d'être* is the copyright protection of photographers, also the Provincial and local photographic societies at present existing in every town, anxious to advance photography and having suitable rooms all ready where local meetings can be held. We have also the goodwill and willing help of the Photographic Press.

I would advise that the Copyright Committees first send forth some such particulars of the urgency of the case as this paper expresses to the Committees of all British Photographic Societies, addressing them both through the Photographic Press and by circular, asking their co-operation by holding meetings and obtaining names to a petition to be laid before the Promoters of the Copyright (Artistic) Bill. Every photographer in Britain should be requested to sign this petition, and as it is so much for his advantage I cannot see why any one need be asked twice. I would also suggest a preamble to the petition, claiming—

(1) That photography has the facility of delineating every phase of (*a*) Lighting, (*b*) Tone Gradations, (*c*) Posing, and (*d*) Facial Emotions, and when under the control of an artist who is trained in this craft, they can, so far as these principal æsthetic powers extend, be varied, combined, and expressed by photography to legitimately represent art results in the true and higher degrees.

(2) That photography has suffered already in its artistic phases through insufficient copyright protection, making photographic work less valuable and causing artists to exert less effort in consequence.

(3) That increasing numbers of large advertising firms are now in a broadcast manner using photographers' work, with a view to disposing of their own wares and to the detriment of photography generally, by offering to reproduce copies from the same at such abnormally low rates that it must include inferior work, while at the same time it degrades photography, and deprives photographers of a legitimate source of income.

(4) That this present unrestricted and inferior reproduction of photographers' work is seriously threatening the continued existence of photography as an artistic profession: (*a*) Because the present artists in photography find it futile to make artistic results which will be reproduced and cheapened *ad lib.*, and (*b*) because students will not become attached to a profession where such an unstable and unsatisfactory condition of affairs exists.

I should further suggest the petition to conclude by praying that as a best means of remedying this present damaging condition to photography, professionally and artistically, the clause be reinstated (or introduced, if by any chance it is a mistake to understand that it has been already inserted), giving the copyright in every negative taken by a photographer to himself, although not including the right to reproduce without consent when taken for monetary consideration.

Possibly such a course of precedence may not be quite in due form, but in the one case we have a total absence of expression from photographers themselves as to whether they take the slightest interest whatever in the Copyright Bill, and, in the other case, the promoters of the Bill must learn that a very large body of important people are claiming their rights as artists, and, moreover, claiming to have their professional existence protected.

Meantime, I would also advise each photographer himself to take some action. Talk about the matter; see other photographers about it; look up the local society about a meeting; write the Secretary of the Copyright Union (Mr. H. Gower, London Chamber of Commerce, Botolph House, Eastcheap, E.C.); become a member of the same. I believe they are liberal enough to accept you as a member, either with or without the subscription of half-a-guinea a year; but, if you can spare it, remember funds strengthen muchly the powers of this movement. Remember also all the time that, even though you be indolent or selfish, it is your own urgent business you are looking after.

If you lose the present combined opportunity, which these advertising purloiners are unconsciously giving you, of bringing this palpable grievance before the promoters of the Bill at the very time when they are formulating it, then, whatever chaotic Slough of Despond you may subsequently wallow in, yet for ever hold your peace.

LYDDELL SAWYER.

FOREIGN NEWS AND NOTES.

Polishing Mirrors.—The *Deutsche Photographen Zeitung* contains an article describing the process by which mirrors are silvered. As our contemporary remarks, the process is dependent upon skill rather than formula; but a careful description of the procedure may be of value to those who may wish to try silvering mirrors for themselves. Three stock solutions should be prepared with distilled water: a 10 per cent. solution of silver nitrate, a 10 per cent. solution of caustic potash, and a 10 per cent. solution of grape sugar. The chemicals should be of the purest—the caustic potash, for instance, such as used for analytical purposes, and the grape sugar in small, fine crystals. The dishes, measures, and every other article with which the solutions may come in contact should be most scrupulously cleaned and rinsed with distilled water. The glass to be silvered should be cleaned all over with strongest nitric acid, and well washed in distilled water. Heavy mirrors should be supported in the dish by small blocks of glass placed at each corner, or two strips of glass, ¾ cm. thick, placed under the extreme edges on opposite sides. Small mirrors, watch glasses, &c., should be fastened with sealing-wax to blocks of wood, or corks, so that the fingers may not come in contact with the glass. To prepare the solution for use, take 10 c. c. of the solution of silver nitrate and add ammonia, drop by drop, until the precipitate formed is redissolved; then add 10 c.c. of the solution of caustic potash, and again add ammonia to redissolve any fresh precipitate. 25 c. c. of distilled water should then be added to the clear solution. Pour 10 c. c. of the solution of grape sugar into another measure, but do not add it to the silver solution until required for immediate use. Rinse the mirror once again by spraying distilled water upon it. Pour the solution into the dish, and place the mirror upon the supports, face downwards. The mirror should be left in the bath for about twenty minutes. The solution will at first be of a brownish-black colour, but becomes clear as the silver is deposited. In removing the mirror from the bath be careful not to touch the surface, otherwise it will be imperfect, and

e fissures will allow water to pass through by capillary attraction d cause dulness. Carefully rinse the mirror once again with dis-led water and set it up to dry. When perfectly dry clean the back d edges, warm it and polish with softest washleather and rouge. e mirror should be kept warm whilst being polished. The rouge ould not be applied direct, the polishing leather being first rubbed another clean plate of glass. Polish with a light circular motion, d do not breathe upon the surface to hasten the process. Varnish e mirror with collodion dissolved in amyl acetate and cover the back th black varnish.

Photographing Wild Animals.—The *Photographische ittheilungen* contains a very interesting series of photographs of ld animals in their natural surroundings by C. G. Shillings. ese photographs were taken in East Africa, and formed the ncipal purpose of the journey, which was made at the suggestion Dr. Heck, the Director of the Berlin Zoological Gardens. The otographs are excellent, and must have been taken under conditions ry trying to the nerves and endurance of the operator. From a scriptive article by M. Kiesling we gather some interesting rticulars of the traveller's photographic outfit, and, as the features the country were likewise to be recorded, more than one mera was necessary. For the photographs of wild animals a metal mera by Carpentier, known as the photo-jumelle, was used. This as fitted with a Zeiss Anastigmat and a magazine carrying eighteen ates $6\frac{1}{2} \times 9$ c., but, the shutter not being quick enough for near oving objects, a Stegemann folding camera with Goerz lens was o taken. As a precaution against failure of the latter, from its icate mechanism, another metal camera, of strong and simple nstruction, known as the Photosphère, was also carried, but the nch rectilinear lens was replaced by a Goerz Double Anastigmat. Stegemann camera, 13×18 c., was added to the outfit for landscape rposes, and was provided with a Zeiss Anastigmat and tele-photo achment. Plates and films of various makes were used. mière's plates for the photo-jumelle withstood the climate ellently. The German plates from the Aniline Company were s successful, and prone to fog. Perutz orthochromatic plates, epting a certain amount of fog at the edges, kept well. The posures numbered some thousands, but only a few test plates were veloped upon the journey, the others being sent over to Germany that purpose, as opportunities occurred. The plate boxes and s of film were enclosed in tin, and sealed with tropical court ster, which obviated the impracticable process of soldering.

The Jena University.—In the *Central Zeitung für Optik und chanik* we see that the firm of Carl Zeiss has subscribed the sum £25,000 towards the erection of a new building for the Jena iversity. The municipality also contributes £7500 and an anony-us donor £5000. The latter gifts, however, are subject to the condi-n that the new site shall be that of the old Schloss, which is not very ractive in appearance. The Grand Duke having assented and en orders for the demolition of the Schloss, the University will v reap the benefit of these munificent gifts. The accommodation he old building has long since been inadequate.

THE PROPOSED PROFESSIONAL PHOTOGRAPHIC ASSOCIATION.

e following additional letters favourable to the formation of a fessional association have reached us; and it will be seen that e are also several others published in the correspondence columns. s issue of the JOURNAL will have reached the greater number its readers a few hours after the meeting, called by last week, has been held. That meeting, it will recollected, was called for Thursday evening, March at eight o'clock, at Anderton's Hotel, Fleet-street, London, . In next week's JOURNAL we shall print a full report of the eedings.

"I should be pleased to become a member of a professional associa-, if formed." ARTHUR WINTER, Studio, 36, Fishergate, Preston.

"Let us by all means form an association for the protection of pro-ional photographers." A. E. STANLEY,
Lansdown Photographic Studio, East-street, Bedminster, Bristol.

"I shall be pleased to join any scheme to further the interests of the ession." WARNER GOTHARD,
udios: Barnsley, 6, Eldon-street; Dewsbury, Victoria-chambers, Westgate; Leeds, 11, Park-row; Halifax, 21, King Cross-street.

"I shall be pleased to become a member of any association that is formed to protect the interests of professional photographers. Wishing you every success."
W. BOND, Magdalen-street and Magdalen-road, Norwich.

"I think your idea regarding the formation of a photographers' protection association excellent. Please add my name to the list of those in favour of such a scheme. Thanking you for your kind offer to help in the matter." E. W. WIGGELL,
Grove-street, Wilmslow, Manchester.

"We write to say we are fully in sympathy with your suggested society for professional photographers, and, if such is formed, we shall most certainly joint it." DAWKES AND PARTRIDGE,
Cathedral Studio, 29, High-street, Wells, Somerset.

"In reference to the proposed photographers' protection association, I myself will only be too pleased to have my name added to the list. Trusting the scheme will be successful."
EDMUND G. WHITEHEAD, "The Studio," 2, Garden-street, Bury.

"Sorry I, for one, shall be unable to attend your meeting for the furtherance of an association of professional photographers; but I may say I am thoroughly in sympathy with the movement, and shall be pleased to join, should one be formed."
W. SMITH, Priory Studio, Priory-road, Crescent, Spalding.

"Please add our names to the list of those desiring the formation of an organized body of professional photographers. We expect other professionals in this town will follow suit. Couldn't the provisional committee arrange with a trustworthy person to call on those that either don't read THE BRITISH JOURNAL OF PHOTOGRAPHY, or, through the existing petty jealousy, are backward in approaching one another? We think the result would be gratifying."
W. H. GILBERT and C. LAWSON, Shrewsbury.

"I am very pleased to see that photographers are at last making an effort to amalgamate to stop this unfair competition, and would like to suggest that branches be formed in all the large centres, and meetings called to induce photographers who have not already sent in their names to join. I hope to be present on Thursday next. Wishing the movement every success."
F. CHAMBERS, 264, Ashton New-road, Beswick, Manchester.

"I am more than pleased to think you are taking the steps you are to bring together all professional photographers. It is not a bit too soon, and without some such help as you are enabled to give it would be impossible to form such a combination, and I, for one, shall be only too pleased to join the proposed professional photographic association, but we must be careful not to allow manufacturers or chemists to manage the concern, or else good-bye to the good it will do us. Let the photographers be independent of both."
GILBERT STRINGER, 7, Chapel Street, Colchester.

"I shall be pleased to join any association of professional photographers formed for the purpose of guarding their interests. Photographers have too long played the part of Rip Van Winkle, and allowed their profession to be made the butt of any one caring to have a fling at it. I am sorry that our leading London brethren's names have not appeared in stronger support, but hope they will make amends by turning up in full force at Thursday night's meeting. Every profession is now protected but the photographic. And 'Why not it?'" FRANK COGHLAN, 31, Carlisle-road, Londonderry.

"We, the Committee of the Aberdeen professional photographers, desire to express our hearty approval and support to any proceedings you might propose to take to form a national association to protect the interests of the profession, and beg to take this opportunity of thanking you for so promptly taking the matter up."

W. B. ANDERSON.	F. W. HARDIE.
W. L. DUNN.	JOHN MACMAHON.
JAMES EWING.	G. AND W. MORGAN.

JOHN S. GREENACRE, Hon. Sec., Aberdeen.

"Once more I see you are in the front of a photographic union. I wish you every success, and I am sorry I shall not be able to attend your meeting. You can rely upon my support, if formed on a sound basis, and the professionals of London take their proper place in the front rank. You know with what difficulty in the past it has been to get combination and interest taken in meetings. Our late friend, Mr. Fall, always took a lion's share in this, but I am sorry I cannot name many of London's foremost professionals that take the interest one expects—looking from the provinces."
T. BIRTLES, F.R.P.S., Legh House Photo. Studios, Warrington.

"Have just returned from Ludlow, where I called upon the two photographers, who intend and, by now, expect have written to give their support. There is a case in point in strong favour of the

suggestion of appointing someone to approach photographers personally. In all the cases I have taken upon myself to canvass, the first question was 'What can be done?' They apparently felt and thought nothing could be done, but after a little conversation got them up to the point to give in their names, at least so far, those at Ludlow. They expressed pleasure at my calling, and would otherwise have let the matter slide, though the danger and evils was fully appreciated, and I have not the slightest doubt but that a great number would be only too willing to join if approached in the same manner." W. H. G.

"Shall be pleased if you will add my name to any photographic society whose aim is to uphold the professional photographer, and willingly contribute towards the same."

CHAS. A. JACKSON, 2, Clegg-street, Oldham.

"I enclose a paper signed by all the professional photographers in this district, and a copy of a communication we have likewise made to Messrs. Ogden and Lever Bros. upon the subject of their advertisements." H. J. GODBOLD, 38, White Rock-place, Hastings.

"We, the undersigned professional photographers of Hastings, St. Leonards-on-Sea, and Bexhill, desire to represent to your directors that the plan recently adopted by your company of offering, by way of advertisement, cheap reproductions of photographic portraits is inimical to the best interests of our profession. While recognising your legal right and power to act as you have done, we would appeal to your sense of justice not to increase the difficulties of a profession already suffering from great internal and quasi-amateur competition. We would call your attention to the fact that the charges made by photographers for portraiture of the best class rarely cover the initial cost of producing the several negatives usually now expected by their patrons for selection, and that they depend upon the demand for subsequent copies for recouping expenses and securing a profit. We trust you will consent to reconsider this matter, and adopt some other form of advertisement which will not interfere with the vital interests of a profession, many of whom in the past have been your customers and well-wishers.—Signed by Messrs. BLOMFIELD, BOYD, BRADSHAW, BREACH, COLLINS, CROUCH, DALMAYNE, EASTON, EDDY, GODBOLD, MOORE, PEPLOW, PERRY, THOMAS, UDNEY, VIELLER, WESTON AND SON."

A preliminary meeting was held at the Creamery, Robertson-street, Hastings, at which a few of the oldest-established photographers at Hastings attended, when it was unanimously agreed to form a society for the protection and furtherance of the interests of professional photographers, and to co-operate with any national organization of that nature which may be formed for such purposes, as suggested in recent issues of THE BRITISH JOURNAL OF PHOTOGRAPHY. To this end it was decided to invite the adhesion of all those photographers in the district not present at the meeting, inviting them to append their signatures in order that they may attend future meetings, which will be called when necessary.

Present at Meeting on 18th.

H. COLLINS (Blomfield & Co.).
HENRY J. GODBOLD.
ARTHUR D. GODBOLD.
A. R. PERRY.
SYDNEY SHAW (Bradshaw).
WILLIAM A. THOMAS.

Signatures of adherents subsequently obtained.

J. H. BLOMFIELD.
H. B. BOYD.
A. M. BREACH.
W. M. CROUCH.
DAVID J. EDDY.
DALMAYNE AND CO.
H. J. EASTON.
A. PEPLOW.
A. PRICE.
EMIL WIELER.
J. WESTON AND SON.
MELANCTHON MOORE.

EXHIBITION OF THE BRENTFORD PHOTOGRAPHIC SOCIETY.

AFTER holding two exhibitions in a very modest form, the Brentford Photographic Society has found itself strong enough to attempt an Exhibition on a scale which deserves our recognition.

The Brentford Public Baths, where the Exhibition was held on the 19th and 20th inst., is a place as well suited for an exhibition as any place not specially constructed for the purpose can well be, and those of the Society who were responsible for the organization and general arrangements are to be congratulated on the successful way in which they carried out their ideas. The Exhibition as a whole, did them credit, and the work shown in the open classes could not fail to be both instructive and interesting to the members of the Society and other visitors.

We noticed that, whereas in the members' work there were no classes, the only division being in a separate entry for beginners' work, the open section was divided into the usual subject classes. We were told, at one of the more important exhibitions held recently, in justification of this division into classes, that exhibitors d classes, and that many would not exhibit unless the work were cl fied. If this is the fact, there is something to be said from e point of view of those holding an exhibition in favour of retai this archaic arrangement, but, from the visitors' point of view, re is nothing to be said in its favour. It is almost like taking beef and mustard in separate courses. Speaking from our own e sive experience of viewing exhibitions as a visitor, it is a plea should never advocate if the best impression of the work, as a w is to be given. This Exhibition provided a striking example in p The members' work, it is true, formed but a small proportion o show; but the fact that it was not split up into sundry sect gave it an interest, nay, an importance, which it would not otherwise possessed.

The judges were Messrs. J. A. Hodges, J. C. S. Mummery, J. A. Sinclair. In their report they "regret to notice evidence hand work upon the prints, which they consider prejudicially affe their pictorial qualities," and, in withholding four of the eight me in the open pictorial classes, they support our contention in the c ments we have already made. In the Open Classes the principal hibitors were C. E. Walmsley, W. E. Walker, Lieut.-Col. Shipw W. E. Justin, E. G. Boon, G. H. Gill, S. R. Holl, A. E. Attfield R. Read, jun., J. D. Shields, W. Illingworth, Graystone Bird, A Lane, H. Lawrence, J. L. Shawcross, H. Gentry, F. W. Gregg, Carey, S. W. Whiteman, W. Howell, and Mary C. Eames.

The members' work made a very creditable show for a young soci Brentford is full of quaint buildings, many of them of histor interest, which are fast disappearing to make room for modern provements. We regretted that the members had neglected to ut their opportunities in this direction. We noted as commend work by S. E. Benfellow, F. H. Read, Hilton, Grundy, and G. Baker.

The trade exhibitors were Messrs. J. J. Griffin and Son, San Shepherd, J. Humble, the Colour Photo Co., and the Warw Dry Plate Co.

Several minor points in regard to the arrangements were worthy notice and commendation. The pictures were well hung, and ne in numerical order, and the not unimportant matter of using sm numbering labels and placing them where they were least harm was carefully seen to.

THE AWARDS.—OPEN CLASSES.

Class A.—Landscape, &c.—Silver medal, C. E. Walmsley; bron W. E. Walker.

Class B.—Portraiture, &c.—Silver medal, W. Illingworth; bron withheld.

Class C.—Architecture.—Silver medal, F. W. Gregg; bronze, wi held.

Class D.—Flower and Animal Studies.—Medals withheld.

Class E.—Lantern Slides.—Silver medal, F. W. Gregg; bron Graystone Bird.

MEMBERS' CLASSES.

Class F.—Any Subject.—Prize, F. H. Read; commended, Hil Grundy.

Class G.—Beginners.—Prize, F. M. Ames.

Our Editorial Table.

SPECIMENS OF THREE-COLOUR HALF-TONE PRINTING.

By the Graphic Art Society, Geneva.

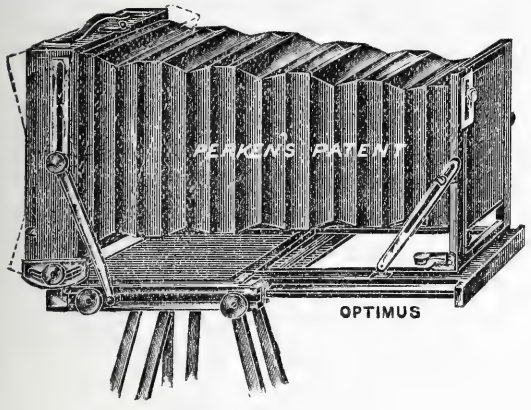
MR. J. R. GOTZ, of 215, Shaftesbury-avenue, W.C., the Lond agent of the above-named well-known Swiss house of photo-mechani printers, has submitted to us a number of specimen prints in thr colour half-tone produced at Geneva. These we have examined wi much interest, the colour renderings being vivid, natural in effe and accurate in registration. Indeed, of small examples of jewelle enamel, painted and inlaid work, we have not seen better reprodu tions by this process. It is a moot point whether Continental English three-colour printers excel at this method; certainly t Graphic Art Society of Geneva have persistently followed it up, a the beautiful specimens Mr. Gotz has to show indicate that they a doing so successfully.

AN IMPROVED SWING-BACK.

Designed and manufactured by Perken, Son and Co., 99 Hatton-garden, E.C.

THE accompanying diagram illustrates an important improvement taper bellows cameras, introduced by Messrs. Perken, Son, and Co Ltd., of 99, Hatton-Garden, London. Every user of the ordinar "taper bellows" camera is aware of the great drawback existing consequence of the swing-back not being central. As a result, th

amera has to be refocussed each time the vertical swing-back is used. n the camera submitted to us this drawback is entirely obviated, as ill be seen by a glance at the illustration. The side struts are so onstructed as to ensure a rigid centre, and by means of an arc tted to each side of the camera body, a swing is obtained on the ost correct principles, and without any sacrifice of rigidity. The lamping screws, which securely fix the position when the back is



wung, are by a simple mechanical contrivance so constructed as to ct as a hinge when the camera is folded up. All cameras of the aper pattern manufactured by the company will, in future, be fitted ith this important improvement, and, as we understand, the patentees re prepared for a small royalty, to grant licences to other makers o enable them to adapt the movement to their cameras, we anticiate that so obvious an improvement will be widely adopted.

Catalogue Received.

Hobbies, Ltd., of 12, Paternoster-square, E.C., send us a copy of heir 1901 catalogue of photographic apparatus, stand and hand ameras, pocket and folding cameras, accessories and chemicals. It lustrates an excellent assortment of photographic apparatus for amaeur workers, who would do well to apply for a copy at the address iven, or at one of the company's many branches in London, Liverool, Birmingham, and Glasgow. Hobbies' cameras are obtainable n the weekly payment system, and a speciality is made of cheapness llied with good quality.

Studio Gossip.

"The Largest Photograph in the World."—A photograph which is aid to be the largest in the world, was recently taken of the general ffice of Swift and Co., at the Union Stockyards, Chicago. This room as a floor area of 46,918 square feet, and here 700 clerks are emloyed. A large number of flashlights had to be lighted simultaneously, o that electricity was used, says "The Western Electrician." A storage attery with twenty cells was installed temporarily and connected to he temporary circuit in pairs, giving a pressure of four volts and a large urrent capacity. Three hundred charges of flashlight powder were rranged around the room, and the fuses to ignite them were all conected in multiple to ensure simultaneous ignition. A stage was built n one corner of the room for the large camera. The plate used was ½ by 8 feet in size. A heavy plate-glass plate was coated with emulion for the purpose. In developing it, four men were required for its andling.

Messrs. Raphael Tuck and Sons, of Raphael House, Moorfields, E.C., forward us half-a-dozen packets of their latest postcards, the ubjects this time embracing: 1. Coloured portraits of their Majesties, he King and Queen. 2. Souvenir postcards, commemorating the visit f the Duke and Duchess of Cornwall and York to Greater Britain. . Rough sea views. 4. A number of reproductions from some of the rincipal galleries. Messrs. Tuck write: "You will be interested to learn hat the use and collecting of picture postcards in the United Kingdom s greatly on the increase, and we are glad to say that our unrivalled roducing facilities enable us to contribute in no inconsiderable degree o the rapid advance which the usage of these artistic little missives s making in the favour of the public. Upwards of two thousand indiidual designs are either already issued by us or are under weigh, all hese being eligible for our £1000 collectors' prize competition, which we nderstand from all sides is acting as a great incentive to postcard colecting. If we read the signs aright, the immense dimensions attained y the picture postcard boom in Germany and on the Continent genrally (a boom which, owing to its undoubted art and general educational endencies has received the warm support of the entire Continental press rom its inception), will be repeated in this country at no distant late."

Slater's Excursions.—We have received from Mr. W. F. Slater, the photographer's own "Thomas Cook," a programme of six photographic excursions to the Continent, which it is proposed to organize between the months of April and September next. In his introductory remarks Mr. Slater says: "For the last four years, during the month of August, I have organized photographic excursions to the Continent for members of the S.L.P.S., and their friends. These excursions have been well attended and given every satisfaction, each trip increasing in numbers, so much so, that last year many would-be excursionists could not be accepted. Many who have wished to attend these Continental excursions have been unable to do so owing to the date of their holidays not being in August, and many have asked if it were not possible to arrange another date. I have, therefore, this year arranged for six excursions, and my reason for doing so is that I feel there is a necessity for excursions arranged for photographers and conducted by a practical photographer. Hitherto nothing outside my own efforts has been attempted in this particular direction. Although these are photographic excursions, non-photographers are, needless to say, always welcome, and will find the same very interesting and enjoyable. Every effort on my part will be made for the comfort and pleasure of each individual." All communications should be addressed to Mr. William F. Slater, 5, Firs Parade, High-road, Lee, S.E.

News and Notes.

The death is announced, at Eastbourne, of the Rev. Victor Macdona, formerly of Bedford, and at one time a well-known amateur photographer. The deceased had held various livings in Lancashire and Cheshire, and at one time numbered the late Mr. Gladstone among his parishioners.

Royal Photographic Society.—Lantern meeting, April 2.—Mr. Charles Reid will give an illustrated lecture, entitled "Animals and birds in their native haunts," at eight p.m. The exhibition of photographs, by Colonel J. Gale, now on view at 66, Russell-square, may be seen daily from 10 to 4 (Wednesdays 10 to 8), on presentation of visiting card.

Photographic Convention of the United Kingdom.—There will be a meeting of the Council, at Anderton's Hotel, Fleet-street, London, E.C., on Tuesday, April 2, 1901, at seven o'clock. The following is the agenda: To discuss and complete the arrangements for the Oxford meeting; to discuss a communication from the "Union Internationale de Photographie;" general business.

We are sorry to learn of the death on the 10th inst., of Mr. Frederick Parsons, proprietor of the well-known business of Hinton and Co., 38, Bedford-street, Strand. The deceased gentleman was connected with the photographic trade for a great many years, and was much respected. He had recently been in failing health. The business of Hinton and Co. will be carried on as usual by the late Mr. Parsons' son, Mr. F. T. Parsons, to whom we wish every success.

Leicester and Leicestershire Photographic Society's Exhibition.—The followed is the list of awards:—Open class.—Silver medal, Miss Evelyn Boden, "The look she hath," &c.; bronze medal, Dr. Grindrod, "A Shallow of the Wye." Lantern slides.—Silver medal, Mr. W. A. Taylor, "Tideswell Church;" bronze medal, Mr. Graystone Bird, "Cup of Tea for Dollie." Local class.—Silver medal, Mr. H. Walker, "Banqueting Hall, Haddon Hall;" bronze medal, Mr. E. W. Bush, "Midst trees that make so sweet a shade." Lantern slides.—Silver medal, Mr. R. W. Harvey, "Mount Collon (Arolla);" bronze medal, Mr. George Bankart, "Luxembourg." Special silver gilt medal for the best print in the Exhibition.—Miss Evelyn Boden, "The look she hath," &c.

The Thornton Heath Exhibition.—The following is the list of awards at the First Annual Members' Exhibition of the Thornton Heath Polytechnic Photographic Society, on Saturday the 23rd inst. Class A. Hand camera work.—Silver medal, Mr. H. C. P. Harpur, "Coming down the Medway;" bronze medal, Mrs. C. A. Bynoe, "Bedham Common." Class B. Landscape, seascape, and river scenery.—Bronze medal, Mr. A. Willcocks, "In the Shade." Class C. Any other subject.—Bronze medal, Mr. F. O. Bynoe, "The Potato Peeler's Queer Story." Class D. Lantern slides.—Bronze medal, Mr. W. H. Rogers, "Sunshine and Shade." President's silver medal for the best picture in the Exhibition.—Mr. F. O. Bynoe, "The Potato Peeler's Queer Story." Mr. W. H. Rogers superintended the hanging, and he and his committee were warmly congratulated.

Commercial & Legal Intelligence.

Letters of Allotment for the issue of 60,000 shares in the Lumière North American Company, Limited, have been posted.

Mr. J. L. Cox, who was associated for thirty-two years with the firm of Messrs. George Mason and Co., of Glasgow, has entered into business for himself as a wholesale photographic dealer, at 70, Prestbury-road, Macclesfield.

Messrs. McKellen, Limited, are about to open a depôt in the centre of the city of Manchester for the greater convenience of their customers.

A Correction.—Messrs. Newton and Co., of 3, Fleet-street, write: "May we ask you to note that the firm signing themselves Newton and Co., are not connected in any way with Messrs. Newton and Co., Opticians, of 3, Fleet-street, London."

Damages for a Damaged Photograph.—At the City of London Court on Thursday last week, Mr. Henry Andrade, of 64, Faversham-road, Catford, sued Mr. John Corlett, the proprietor of "The Sporting Times," 52, Fleet-street, E.C., to recover the sum of £3 16s. 6d., in respect of a photograph that had been damaged. We have referred to the case from time to time, and when it was last before the Court, it transpired that the photograph was sent to the defendant in order that he might make a copy of it, but whilst it was in his possession it became damaged with ink spots. The defendant said he was quite sure the spots could be taken out. He was given an opportunity of removing the spots, but failed to do so, and his Honour thought that unless the parties could agree upon terms, a jury should be empanelled to fix the amount of damage. It was now stated that the defendant had abandoned his defence, and judgment was accordingly given for the plaintiff with costs.

The Law of Patents.—With reference to the question referred by the Board of Trade to the Departmental Committee on Patents, as to whether additional powers should be given to the Patent Office in respect of inventions which are obviously old or have been previously protected by leters patent in this country, a number of engineers and gentlemen interested have presented a petition for consideration. In their opinion it is desirable to afford applicants for patents full information concerning the novelty of inventions in respect of which letters patent are sought. In any unopposed case letters patent should not be refused, they think, on the ground that the alleged invention is obviously old or has been previously patented; and the Patent Office should not be required to make it publicly known that the specification has been officially amended. Among the signatories of this petition are Lord Kelvin, Sir E. J. Reed, Sir Frederick Bramwell, Sir W. Preece, Sir Douglas Fox, Dr. Elgar, Mr. Thornycroft, Mr. Hiram Maxim, Mr. H. Chapman, and Mr. Frank Webb.

The International Fancy and Leather Goods Exhibition will be held at Princes' Skating Club, Knightsbridge, London, S.W., from May 4 to June 1, 1901, under the direction of the British and Colonial Exhibitions, Limited, 42, Poultry, London, E.C. The chief officials are—Managing Director, Mr. Maurice Barnett; General Manager, Mr. Joseph Teleki; and Secretary, Mr. J. Wilkins. The Committee of Patrons includes his Excellency the Belgian Ambassador, his Excellency the Danish Ambassador, his Excellency the Greek Ambassador, his Excellency the Servian Ambassador, his Grace the Duke of Hamilton, the Most Hon. the Marquess of Northampton, the Most Hon. the Marquess of Bristol, the Right Hon. the Earl of Chesterfield, the Right Hon. the Earl of Dartmouth, the Right Hon. the Earl of Romney, the Right Hon. the Earl of Clarendon, the Consul-General of Belgium, the Consul-General of Spain, the Consul-General of Portugal, the Consul-General of Austria-Hungary, the Earl of Crewe, the Earl of Kinnoull, the Earl of Gosford, K.P., the Viscount Hardinge, Lord Aberdare, Lord Amherst, Lord Hotham, Hon. Lord Granville Gordon, and many others. We see by the classification that photographic apparatus and lantern slides are included in Group 6: articles relating to sports and pastimes.

Flashlight Photographic Cartridges.—Application for a New Trial.—Last week, at the Liverpool County Court, the case of M'Nair against Kodak, Limited, came before his Honour, Judge Collier, on an application by the defendant company for a new trial. The action was heard by his Honour on the 7th inst., and the jury awarded the plaintiff £5 for injury to his hand, caused by the explosion of a flashlight cartridge which he had purchased from the defendant company, who, he alleged, did not give him proper or sufficient directions at the time of the purchase, as to the use of the explosive when he desired to use it for taking photographs at night. His Honour, having heard the arguments on both sides, said that he would grant a new trial because he did not think any improper directions had, according to the evidence, been given by the Kodak Company to the plaintiff at the time of the purchase, and he did not think that the jury were justified, as reasonable men, in finding that improper directions were given. Mr. Rigby Swift.—Do you hold that it was a verdict that reasonable men should not have come to? The Judge.—Yes, I do not think there was any evidence at all of improper directions. Mr. Swift.—Will your honour give me leave to appeal from your decision in this application? The Judge.—Yes. Mr. Rigby Swift (instructed by Mr. Hood) appeared for the plaintiff, and Mr. A. P. Thomas (instructed by Mr. J. H. Glover) for the defendant company.

An Extraordinary Case.—Williams versus Brown and Brown.—The plaintiff in this action, Mr. Samuel Anthony Cox Williams, photographer, of Stanley Chambers, Gallowtree-gate, Leicester, sued the defendant and his wife, Elizabeth Brown, to recover the sum of £25, in respect of damages for an alleged breach of indenture of apprenticeship, dated July 24, 1899, and made between the plaintiff and Mrs. Brown, who was then Miss Broughton. Mr. Simpson, who appeared for the plaintiff, stated that at the time the indenture was entered into, Miss Broughton was twenty-five years of age. She told plaintiff that she was of independent means, but that she would like to learn the duties connected with the reception room of a photographer. She left in the following June, just as she was becoming useful to the plaintiff, and married the defendant Brown. The plaintiff stated that Mrs. Brown entered his employ, in response to an advertisement. She entered into an apprenticeship indenture or contract, whereby she agreed to be bound to the plaintiff for two years. She was to receive nothing for the first three months, 2s. 6d. per week for the second three months, 5s. per week for the succeeding six months, and 7s. 6d. per week during the second year. At first she seemed perfectly satisfied with her position, but she then became acquainted with the defendant Brown. Subsequently Brown called at the studio, and in a most supercilious manner asked plaintiff whether he knew that Miss Broughton was about to leave. She left in October, and sent a letter saying she was not accustomed to being called a lunatic, and declining to stay in a place where she was not treated with civility. Plaintiff and his wife denied having used such a term to Miss Broughton. The defendant, Mrs. Brown, said her duties consisted of the reception of customers, spotting, and mounting photographs. She left entirely on account of Mrs. Williams's temper. She had no means of her own. She had £30 when she first entered plaintiff's employ, but she used that to live upon. His Honour Judge Wightman Wood, before whom the case was heard at the Leicester County Court, in giving judgment said there was no case whatever against the male defendant, but with regard to Mrs. Brown, it was monstrous that people should tear up contracts because of a tiff. There was no doubt that defendant had some other strong ulterior motive, but whatever it was, it was not justification for her giving up her employment, when she had contracted to serve plaintiff for two years. There would be judgment for the plaintiff for £12 damages, and costs.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
1.....	Bradford Photo. Society	*Readigraph Enlarging and Multiplying Apparatus.* Mr. Ardell.
1.....	Camera Club	Discussion: *The Development of Rollable and other Films.*
1.....	Doncaster	*Negatives and Prints, their Improvement and Modification, with numerous useful Formulæ.* W. Ethelbert Henry, C.E.
1.....	Glasgow and West of Scotland .	Demonstration: *Lantern Slides.* A. J. Kay.
2.....	Rotherham	*Architectural Photography Technically considered.* H. W. Bennett.
3.....	Edinburgh Photo. Society	*The Scientific Value of Photography in Astronomical Investigations.* George Clark, M.A.
3.....	G.E.R. Mechanics Institution...	*Carbon Printing.* Mr. Bennett.
3.....	Borough Polytechnic	Rummage Sale of Members' Apparatus.
3.....	Woodford	*Home Portraiture.* F. G. Emler.
4	Hull	Annual General Meeting.
4.....	Leigh	Demonstration: *Velox and other Specialities.* D. A. Nightingale.
4-9.....	Liverpool Amateur	Excursion: Llanrwst and District. Leader, Paul Lange.
5.....	Croydon Camera Club	First Excursion of the Season.
11.....	Liverpool Amateur	Auction of Photographic Goods.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 21,—Mr. R. J. Kindon in the chair.

The Chairman passed round a negative developed with pyro-soda, and asked the reason of a dense yellow stain that appeared while the plate was in the developing bath. He was not aware that anything had been dropped into the bath as the appearance of the defect would suggest.

Mr. F. C. Kellow showed a bromide paper print, developed with an amidol developer, that was covered with some irregular markings. The trouble occurred only with one sheet out of fifty.

Mr. S. H. Fry thought the best advice that could be given was to try some newer paper. He did not think it followed that all of the sheets of a packet of paper came from the same roll; it was, therefore, not strange that one piece out of fifty had proved bad.

Mr. J. E. Hodd agreed, saying that he had often found a bad sheet of P. O. P. in a batch that was with this exception quite good. The marks on Mr. Kellow's print were such as would be obtained on a piece of stale bromide paper.

Mr. Ernest Human showed a specimen print as now advertised by the proprietors of Ogden's cigarettes. He drew attention to the fact that the advertisement referred to "real permanent photographs beautifully finished and mounted" in size measuring 4½ by 6½ (including mount), with a sort of guarantee that the photographs were quite free from any advertising matter. He pointed out that the mount of the photograph was impresed with the words "Ogden's, Limited," which, in itself, was an advertisement, and that the photograph itself was by no means 4½ by 6½ in size, but a little print on a big mount.

An animated discussion ensued upon the legitimacy of firms concerned primarily with other wares encroaching upon the photographers' field of business with such cut-down prices; and the question of the means that could be utilised to put a stop to this practice was gone into at considerable length. Some saw in the innovation the forerunner of a severe blow to the profession and trade; while others were content to regard it as a merely temporary advertising medium that would do

tle real harm and would disappear in due course. It was suggested at a combination of photographers and salesmen against the move ade by Ogden would have some effect, but the contrary view, that combine, unless materially stronger than the other, could do any od, was also expressed.

A number of slides were shown in the lantern, contributed by Messrs. C. Kellow and J. W. Hodges, those of the latter being varied and teresting.

Some slides in the possession of the Association were also examined, id amongst them were several old Convention slides, in which the ell-known figure of the late Mr. H. P. Robinson several times ap- ared.

PHOTOGRAPHIC CLUB.

ARCH 20,—Mr. J. W. Mason in the chair.

Mr. A. Mackie described some curious markings that he had found on me collodio-chloride paper. They were in the form of fine lines or reaks of an orange colour, and absolutely parallel. They were evi- ntly produced in the coating machine, but he could not understand w the emulsion took this colour. Referring to albumenised paper ints, of which he had not made any, until recently, for many years, said he was beginning to understand why it was that photographers ere giving up so generally the use of albumenised paper for P. O. P. e got four pieces of paper out of a sheet, and in five sheets he found t least one piece of paper per sheet was spoiled by a flaw of some ind in it.

Some discussion took place regarding the best backing for orthochro- atic plates, it being mentioned that Mr. Sanger Shepherd advo- ated one that contained Indian ink in preference to the ordinary red acking which would not prevent halation in the red negative or the reds f the picture.

Mr. F. A. Bridge thought that gas black, which was much cheaper than ndian ink, would answer very well mixed up with the caramel and burnt enna.

The remainder of the evening was devoted to the display of some ides belonging to the Club's collection and to some experiments with ne electric arc light for projection.

Croydon Camera Club—A considerable attendance of members as- embled on Wednesday, March 20, to take advantage of Mr. W. H. mith's demonstration of how to ring the changes between cold black nd warm sepia on platinotype paper. The means advocated for modi- ying the resultant tone of the print were as follows:—Cold black tone, resh paper and cold bath (about fifty-five degrees). Warm tone, paper xposed to air for an hour after printing. Warmer black, same as ast, but developed at 150 degrees. A yet warmer tint is attained by eveloping cold bath black paper in a bath previously used for sepia aper. The sepia paper was next employed, and first developed ith an ordinary black paper developer. There resulted a cool rown. The ordinary sepia developer, used cool, gave a somewhat flat rint of medium brown. The same developer used at 160 degrees Fahr. roduced from a companion print a strong, bright, warm, brown pic- ure. Dilution of the developer with glycerine was also advocated where warmer tone than normal is desired. Mr. Smith subsequently supple- ented his interesting demonstrations by an exposition of how to colour latinotypes with crayons. At the instance of the President, seconded by he Vice-Chairman (Mr. L. G. Kough), a very hearty vote of thanks as carried by acclamation. Mr. Gregory gave a short explanatory ddress about the remarkable zoological and botanical attractions of eonardslea, which the club hopes to visit on April 5.

North Middlesex Photographic Society.—March 25,—Mr. W. Taylor in he chair. Mr. H. W. Bennett gave a lecture on "Intensification of nega- ives; a consideration of different methods." By means of charts and the lackboard, the lecturer compared the results of the mercury intensifier n common use, and Wellington silver intensifier. Mercury followed by odium sulphite gave a slight increase in the high lights, but a loss in he shadow detail. Wellington's gave practically an equal increment f density all through, and greater intensification. The greatest inten- ification obtainable was by the use of Wellington's formula followed by ercuric bichloride and potassium bromide two per cent. solution, fol- owed by sodium sulphite ten per cent.

Brechin Photographic Association.—March 20,—The Kodak Panoram Camera was shown through the kindness of Kodak, Limited. The amera was very favourably criticised, and the examples of work shown y the Secretary were well received by all present. Mr. J. D. Ross, Vice-President, gave some interesting particulars of the "Novitas" tripping film, and showed his first "attempts" with it. Several other ovelties were shown, and six new members were added to the roll. Messrs. Robertson and Kirke agreed to give a demonstration with gas- ight "papers" next month.

Newcastle-on-Tyne and Northern Counties Photographic Association.—t the last meeting Mr. J. P. Gibson read a paper, entitled "Some Bye-paths in Photography." Mr. Gibson divided his subject into the fol- owing heads: Ordinary Portrait and Landscape Photography, Medical hotography, as represented by X-ray work, Natural History hotography, as in photographing birds and animals, showing some ery fine slides by Messrs. Reid and Cookson, Botany was represented y some very effective Woodburytypes and by magnificent slides by Mr. W. E. Cowan, Geology mostly by Mr. Gibson's own work, Electricity by what the lecturer called some of the finest photographs of lightning which he had seen by the late Mr. M. Autyand, mentioned incidentally that he believed he (the lecturer) was the first to ever make the light- ning portray itself by means of the camera. Photographs of bullets passing through a sheet of glass were shown, and the lecture con- cluded with examples of the use of the art-science in illustrated jour- nalism.

Blairgowrie and District.—The monthly meeting of this Association was held on Tuesday last, Mr. A. Geekie, President, in the chair. One new member was admitted. Mr. Nightingale, of Messrs. Griffin and Co., London, demonstrated Velox paper and "Gaslyght" lantern plates. For development, he recommended a combination of metol and hydro- quinone. An acid bath was preferable for fixing as there was less chance of staining, although Velox was less liable to stain than many other papers. The most important point was correct exposure. as with Velox there was not a great deal of latitude. Then the proportion of bromide in the developer was also an important factor; bromide acts principally as a clearing agent; in Velox over-exposure gives excess of contrast in direct opposition to ordinary bromide paper or plates.

Patent News.

THE following applications for Patents were made between March 11 and March 16, 1901:—

SPECTROSCOPES.—No. 5086. "Improvements in Star Spectroscopes." THOMAS THORP.

PANORAMIC CAMERAS.—No. 5140. "Improvements in Panoramic Photographic Cameras." Complete specification. DAVID HENDERSON HOUSTON.

LENSES.—No. 5170. "Improvements in Photographic Lenses." HUGH LANCELOT ALDIS.

CINEMATOGRAPHS.—No. 5174. "Improvements in Cinematographs and similar Animated Picture Apparatuses." FREDERICK HOPKINSON and LEONARD CHARLES HOPKINSON.

HAND CAMERAS.—No. 5328. "A Device for Use with Snap-shot Cameras." WILLIAM HENRY ALEXANDER.

TESTING PLATES AND FILMS.—No. 5356. "Improvements in Devices for Testing Photographic Plates and Films." EDWARD SANGER SHEPHERD and CHAPMAN JONES.

ANIMATED PHOTOGRAPHY.—No. 5497. "Improvements in Means for Obtaining Photographs for Cinematograph Displays." GEORGE ALFRED HIDE.

CAMERAS.—No. 5438. "Improvements in Photographic Cameras." HERBERT EDWARD HICKOX and FORBES ALEXANDER PHILLIPS.

DEVELOPERS.—No. 5502. "Manufacture of a Photographic Developer Stable in the Dry State." (Communicated by Actiengesellschaft für Anilin-Fabrikation, Germany.) CHARLES DENTON ABEL.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE LINE SYSTEM OF COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I am pleased to see by Mr. Fawcett's letter, that appeared in your issue of the 15th inst., that, as a result of his visit to the Colour-Photo Company's studio, he carried away such a high opinion of our work. He has, however, fallen into one or two slight errors, which I trust to your courtesy to allow me to put right.

He states that he was shown a good specimen of a portrait of a lady, but that a change in his position "altered the colour of her dress in a most bewildering fashion." His explanation that lack of due registration was the cause is not correct. In pictures where the positive and viewing screen are in close contact, the effect which be- wildered him is not observable. For the purpose, however, of ex- plaining our process to our visitors who are not familiar with it, we have found it desirable to keep a certain number of specimens not so closely in contact. No doubt the portrait Mr. Fawcett refers to was one of this character.

With regard to the view which I gather Mr. Fawcett holds, that our lantern slides, when projected, are not satisfactory owing to obtrusiveness of the lines, I can only regret that Mr. Fawcett has not yet been able to accept my invitation to him to visit the exhibition of our pictures to be seen daily at the Crystal Palace. If he will kindly do so, I am confident he will admit that his objection does not apply to the slides shown there. The lines cannot, in fact, be-

seen by any one sitting the ordinary distance from the screen. In confirmation of this, I can refer to the fact that the multitudinous press notices have been most favourable, and that not a single newspaper suggested that the lines were obtrusive or even visible.

Should any one who read Mr. Fawcett's article wish to inspect the pictures, he is quite welcome to call at the office of the Colour-Photo Co., 430, Birkbeck Bank-chambers, Holborn, W.C.—I am, yours, &c.,

CHARLES N. CREWDSON.

Birkbeck Bank-chambers, Southampton Buildings, Holborn,
London, W.C., March 21, 1901.

THE FERROUS-OXALATE DEVELOPER.

To the EDITORS.

GENTLEMEN,—I have noticed in your columns lately several articles in regard to the fading of astronomical negatives, which is certainly deplorable, and any means promising to prevent it should be tried. I will offer a suggestion or two which may be of value in this connexion. It will be noticed that negatives made when the ferrous-oxalate developer was used will generally be found in a better state of preservation than those developed with the organic developers. This is undoubtedly due to the fact that the ferrous developer gives a form of reduced silver more analogous to the metallic, or that produced on wet collodion plates with the iron developer. And, if I mistake not, the same difference will be found in the stability of bromide prints developed with the two forms of developers mentioned. I have noted the difference with negatives we made as far back as 1884, some of which are in perfect condition, and others discoloured and faded. The latter is the case in general with negatives not thoroughly fixed, or intensified with the mercurial salts, or where reducers have been used. For years I have made it a practice to treat all negatives, reduced or intensified with mercurial salts, with a solution of acid sulphate of iron to finish up with. A change of colour to a dark grey on the surface of the film takes place, and such negatives seem to be stable so far. But for the star negatives mentioned, it would be well in future to use the ferrous-oxalate developer, as there seem to be good technical reasons for believing that such negatives, if otherwise treated properly, will prove more unchangeable than those developed with the organic compounds.—I am, yours, &c.,

D. BACHRACH.

DARK CHLORIDE OF SILVER.

To the EDITORS.

GENTLEMEN,—May we add the following particulars to your remarks on above, under the head of Answers to Correspondents in the issue of March 15?

Dark chloride of gold $AuCl_3$, if pure, should contain just under 65 per cent. of metallic gold, but we have found the commercial product vary between 28 and 42 per cent., according to the amount of sophistication it has undergone; it is only made abroad, and probably no two brands are of the same strength. We used to manufacture it ourselves, but it was never asked for, and we ceased to keep it in stock. It is strongly acid.

The percentage of metallic gold in genuine English chloride ($NaClAuCl_3+2\ H_2O$) is 49.45 per cent., and should be free from acid. We are, yours, &c., JOHNSON AND SONS, Manuf. Chemists, Ltd.

23, Cross-street, Finsbury, London, E.C., March 19, 1901.

THE BUBBLE AND SMOKE PICTURES.

To the EDITORS.

GENTLEMEN,—Apropos of the above, it will doubtless interest you and your thousands of professional readers to know that, here in Southsea, is shown a specimen of Ogden's productions in a tobacconist's window, and that the proprietor of the business is a commercial traveller for a well-known firm of photo dealers, who has the audacity to call upon myself and others, expecting to do business with us. Verbum sap.—I am, yours, &c., PROFESSIONAL.

Southsea, March 19, 1901.

OGDEN-LEVER PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—In reference to above, it has struck me that photographers might help themselves in a very simple way, which, if carried out generally, I believe would have appreciable effect. In my studio, waiting and dressing rooms I have a framed notice (not too obtrusive) to the following effect:—"We sincerely trust that our sitters will not avail themselves of our experience and attention in order to forward results of same to the large tobacco and soap manufacturers who are at present injuring the photographic trade by offering to copy same. It is the general opinion that this is an unfair trading, as, however good copies may be, the photographer should be entitled to any benefit arising from the production of good work. Trusting you will help us by ignoring these soap and tobacco schemes.—We are, &c."

In reference to above, I may say that many of my customers have been most emphatic in declaring themselves against this form of piracy, and, in not a few instances, have decided to discontinue the use of these firms' manufactures. By bringing the facts before the people who are liable to support these schemes, I venture to think good may be done.—I am, yours, &c., OPPOSITION.

March 16, 1901.

HOW TO FIGHT THE INVADER.

To the EDITORS.

GENTLEMEN,—Sympathising with photographers in their apparent helplessness to cope with the many enemies that assail their livelihood, I have been giving much thought of late to the attack of the soap and cigarette makers.

"Ixion's" letter (March 15) was Quixotic, but it contains the germ of the one really practical way to fight this matter to a finish with a certain benefit to photographers. We all know that the class of people who patronise the leading photographers are not the class who will save soap wrappers or smoke 3d. packets of cigarettes; we may therefore assume that the man most seriously attacked is he who is least able to take his own part—I mean the photographer in a humble way of business whose customers include the class who will save soap wrappers and smoke cheap cigarettes. Now, I take it these photographers rarely charge more than 3s. 6d. a dozen for cartes, and their sitters are not always plentiful at that price, so that they should welcome a scheme whereby a very little effort on their part, backed up by the wealth of an opposition soap firm may be made to yield them plenty of ready money. It may come in the guise of the modest half-crown; but copying is easily done when other business is slack, and printing may be cheaply and quickly done on bromide paper (not supplied by the firm who are at present doing the "cut" work for Lever and Ogden), and the print developed by hundreds at a very small expenditure of time. This, however, is a matter of detail upon which I need not enter; the main point is how to put in operation the gigantic machinery of combination lying so ready to the hand of photographers. It is no use being apathetic while starvation stares one in the face; what is to be done must be done now, if it is to be effective.

The first essential is the formation of a committee to lay a suggestion before the leading opponents of Lever and Ogden. Personally I would suggest Watson and Philips (whose Matchless Cleanser and Venus soaps and Old Gold cigarettes are well-known rivals), and would ask them to consider a suggestion somewhat on the following lines, amended as may be deemed advisable.

1. The firms to advertise in the general press that local photographers throughout Britain will honour their wrappers, giving, for twelve wrappers and 2s. 6d., copies of portraits, &c., &c., as may be decided, without putting the holders to the trouble of writing letters and risking loss of the originals by sending them through the post.

2. The firms will supply photographers on request with neatly printed cards informing the public what they undertake to do for the wrappers and cash.

3. The firms' travellers will call upon photographers, and make them acquainted with the scheme and invite co-operation.

4. The manufacturers might even go so far as to supply good mounts for the privilege of a neat advertisement on the back thereof; but this, again, is only a detail.

In addition to the foregoing, I might add the following suggestion: If the photographer is not too dignified to make use of the accumulated soap wrappers, let him partake of the big cash prizes offered by Watson, and so add very considerably to his profits.

As I said before, it is not the big man who is assailed, but the one whose life is a constant uphill struggle. He cannot afford to be "dignified" when his bread and butter is at stake.—I am, yours, &c.,

Maidenhead, March 22, 1901. W. ETHELBERT HENRY.

THE PROPOSED ASSOCIATION.

To the EDITORS.

GENTLEMEN,—May I suggest the following to meet the case, and cut the ground from underneath the pirates who trade and live by the work of others? First, a combination of photographers, if possible, every photographer. A small subscription would, I believe, answer. The larger firms would not need help. They would seek out other ways for attracting the public to their wares.—I am, yours, &c., UNITY.

To the EDITORS.

ENTLEMEN,—Having taken a great deal of interest in the correidence re Messrs. Ogden and Lever which has taken place in your mns during the past two or three weeks, may I say that I am e than ever convinced that unless a great change takes place ng professional photographers, the trade will gradually sink into isiness that will not be worth taking up as a means of livelihood. v is the opportunity for them to place themselves on a level with r trades. Combination is what is required, there is no doubt. will they take it up? or will they let it slide by as they have r things which it would have been to their advantage to have ntained? I, for one, really hope they will, not only to meet this case, but for others. I hope this may be the means of several r employees, as I am, sending their names as advocates of this ety, as I am sure that it will be both to the interests of master man, raising both the standard of work and wages into the bargain.

m, yours, &c.,
R. H. WATSON.

14, Philip-street, Newcastle-on-Tyne, March 16, 1901.

To the EDITORS.

ENTLEMEN,—I, among many photographers (and I hope all) will lly give my subscription towards a professional photographic assoion (payable annually), to start immediately. If every one dedent on photography for a living were to give up using any single cle manufactured by any firm cutting prices (and our throats), if the five thousand photographers and the wholesale houses and r dependents, &c., were to do so, I consider that the firms (Ogden Lever, &c.) would lose more than they gain by the new process. and all I can command, will despise any goods made by either n, and extol that of some other not so inclined to harm us, many us having used the goods manufactured by the very firms who try to ruin us.—I am, yours, &c.,

DISGUSTED BY AVARICE.

To the EDITORS.

GENTLEMEN,—I have read with great interest all the letters of your respondents regarding the parasites that are preying on the photoaphic profession. The question of how to deal with the matter is very difficult one, and quite beyond the reach of individual effort. otographers have been for many years fairly successful in busiss, and content to let things drift so long as a comfortable living ld be made; as a class, also, they have been for the most part too lous of each other to form any combination for mutual protection inst present or future aggression, and have allowed many valuable ocesses to drift into other professions that, by rights, belonged to m alone. So feeble has been their resistance to manifest intice that manufacturers of all manner of photographic specialities ve treated them with the utmost contempt, and they, as a prosion, have most unjustly been put upon the same platform as ateurs and the general public. Photographers' only means of protion now, and safety for the future, lies in combination, and, in w of the grave situation and general degradation of the profession adventurers, they will surely now sink all mutual differences and come themselves in a body powerful enough to protect themselves from scrupulous outsiders.

I would suggest the following:—

(1) That a national society of professional photographers be formed, meet yearly in any town selected.

(2) The formation in every town in Great Britain and Ireland of al societies, open to professionals only, each governed by rules ited to the locality, and for the support of which each member will y an annual subscription.

(3) These societies shall discuss local questions affecting their prossion.

(4) They will also be affiliated with the national society of professional otographers, to which each town, according to population, shall conbute one or more representative members.

The meetings of the national society will be of the greatest possible e and interest, as it will represent the labours for the year of all e minor societies, and act as a higher court for the general guidance d good of the profession throughout the country.

I think, Sir, if photographers are to act at all, they should act ickly. Aberdeen has done well in setting the ball rolling. May be kept going, gathering as it goes, until it is heavy enough to ush all that menaces the best interests of a long-suffering, but, I ust, an honourable calling.—I am, yours, &c.,

NORTHERN LIGHT.

To the EDITORS.

GENTLEMEN,—I congratulate you on your effort to rouse the spirit union amongst the photographic profession. I have been a conant reader of your paper (THE BRITISH JOURNAL OF PHOTOGRAPHY) for the last 30 years, and have often felt grateful for the publicity you have given to the various frauds and unfair dealings that were detrimental to the profession. This latest intrusion is a very serious matter for photographers, and I think you are doing the right thing by forming a professional photographers' association, into which should be gathered all professional photographers, large and small, so that we might present a bold front in opposing all such unfair dealings, and put right many other vexed questions concerning the profession generally. May I just give you one reason, amongst many, why I think the association that was formed some years ago did not succeed? There was never a very great number of photographers enrolled as members, and this was partly owing to the fact that the subscription was not high enough for a few of the "big guns," who could well afford more, and rather too high for some small and country photographers, who evidently thought they would not get the same benefit from the association that those in a larger way of business would. You will remember at first the subscription was to be 10s., and in a year or two of its existence a few of the city photographers thought it should be increased to £1, and this increase brought a few more members, but a large number of the old members dropped off, thinking it too much. I think this teaches a lesson in forming a new association. Would it not be wise to have two sums named, say, ordinary members at 5s. per year (or less, if you like), and first-class members at 10s. per year (or more), the latter only to be eligible for working on the executive committee? I think by this means you would secure a very much larger number of photographers to join, and it is most important that all should be brought into the union, so that our power might be felt. Will you excuse me troubling you with this long letter? I thought as I could not get to your meeting on Thursday night, I would just let you know what some of us in the country felt towards the effort you are making. I will do my best to rally the photographers in the Ripon and York districts, and trust the association will turn out a great success.—I am, yours, &c.,

C. WATSON.

Kirkgate, Ripon.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. E. Ashley, 31, Grove-street, Retford. *Photograph of E. Warburton.*

T. Muter, 27, Union-street, Glasgow. *Photograph of sixteen articles of jewellery.*

J. Palmer Clarke, Angel Hill, Bury St. Edmunds. *Photograph of King Edward VII.*

A. Crowder, 169, Spital-hill, Sheffield. *Two photographs of volunteers for South Africa.*

A. J. Swithenbank, Elm Tree Studio, Hunslet, Leeds.—*Two photographs of Private C. Ward, V.C.*

J. Clapperton, 23, Albert-place, Abbotsford-road, Galashiels.—*Photograph of a painting of Sir Walter Scott.*

C. W. Eastoe, Castle Hill House, Caistor, Lincs.—*Two photographs showing 10-guinea ram. Photograph of the last Palmsun Fair.*

COPYRIGHT.—T. KNOWLES. The reports of the case of Nottage versus Jackson, re copyright, and the appeal, will be found in our volume for 1883, pp. 380-392, 436-453. From these you will see that you have no copyright in the pictures.

STAINED NEGATIVES.—J. WALLACE. If all the stains are like those on the negative sent they are, obviously, due to imperfect fixation. As the negatives have all been exposed to light when printing, it is more than doubtful if the stains can now be removed.

VALIDITY OF AGREEMENT.—G. K. Unless we read the agreement in its entirety we could offer no definite opinion as to its validity. From what you say we are inclined to doubt if it would hold good in a court of law. Your best way will be to submit it to a solicitor for his opinion, and upon that rely.

GUM DRAGON.—T. SEDGWICK asks: "What is gum dragon—as he has been told that, when dissolved in benzol, it makes a good varnish for negatives?"—In reply: Gum dragon is another name for gum tragacanth. It is quite insoluble in benzol. Probably your informant meant gum dammar, or you misunderstood him.

SAFE LIGHT.—G. BIGWOOD writes: "Do you consider two thicknesses of deep ruby glass, with a night light inside the lantern, a safe light for extra rapid plates, as I get fog at times?"—In reply: We certainly do consider it a safe light, if the deep ruby is that usually supplied for dark room purposes. The fogging must be sought for elsewhere than the ruby light.

REMOVAL OF SILVER STAINING FROM TROUSERS.—"HELIO" asks how to remove silver bath printing stains for a pair of grey tweed trousers?"—In reply: A solution of cyanide of potassium will take out the silver stains, but we doubt if the colour of the trousers will remain intact. We suspect you will have to invoke the services of a dyer to dye the garment some darker colour.

ADDRESSES WANTED.—"STUDIO" writes: "Will you oblige me with the publisher's address, where I can obtain the following books —'Artistic Light,' by Jas. Inglis; 'The Studio, and what to do in it,' by H. P. Robinson; and 'The Lighting in Photographic Studios,' by P. H. Duchochois?"—In reply: The books mentioned may be obtained of Messrs. Dawbarn and Ward, Farringdon-road, E.C.

SILVER STAINS.—"STAINS" writes: "What is the best method of removing silver stains in a negative caused through printing the same before it was varnished?"—In reply: A weak solution of cyanide of potassium will generally remove such stains. King's solution for the purpose, sold by Marion and Co., is good, and you might try that. Some stains, however, are not removable without injury to the negative.

BUILDING ACT.—B. J. W. If the surveyor to your local authorities says that the proposed studio is not in accordance with the Building Act, and that the designs will not be passed, we should advise you to modify them so that they conform with it, because it will save you trouble in the end. Even if your reading of the Act is correct, and we are inclined to doubt if it is, it will be somewhat costly to fight the matter out in a law court, as well as delay time.

RAPID LENS.—G. GOSS asks: "What is the very quickest working lens I can get for pictures about three inches by two and a half, and about the cost?"—In reply: The most rapid lens for that size picture will be one of the "Extra quick-acting portrait lenses" of about eight inches equivalent focus. With its full aperture, which is nearly *f*-2, it will cover the size well. Its price, by a good maker, is, we think, about twenty-five pounds. See Ross' or Dallmeyer's catalogues.

A CLUB FOR COLOUR PHOTOGRAPHY, &c.—VICTOR SELB asks: "(1) If there exists, at present, in England any society or club exclusively devoted to three-colour transparency photography, and, if affirmatively, to give me the name and address of same. (2) To name also the most important lantern slide club, that favour the exchange of slides."—In reply: (1) Not that we are aware of. (2) Perhaps the Lantern Slide Exchange Club, of which the Secretary is Mr. J. S. Hawker, of Mutley House, Plymouth, may suit our correspondent.

PRINTING MACHINE.—"MACHINE MAN" writes: "I would feel obliged if you could give me any information as to a machine patented by a Bradford firm lately, in Britain, the Colonies, and the Continent, and said to print 400 copies an hour, and direct from the negative. Are the prints collotypes or photogravures?"—In reply: We can give no information about the machine, as we have not seen it. But, as the prints are made direct from the negatives it is certain that they are neither collotypes nor photogravures. They must be bromides or similar prints.

COST OF NITRATE OF SILVER.—W. and Co. write: "We think of giving up P. O. P.'s and using, in our business, albumen paper instead, which we propose sensitising ourselves. We calculate we shall consume as much as from ten to fifteen ounces of nitrate a week. Do you think we should save by making our own nitrate of silver instead of buying it, and about how much an ounce?"—In reply: If your consumption of nitrate of silver was many times what you surmise it will be we should say it would be far more economical for you to buy it than to make it yourselves.

AN AGREEMENT QUERY.—W. H. R. writes: "I have my premises on a five years' lease, and it says in the agreement that I must leave the premises in the same repair as when I took them. I am told that it does not include the outside repairs. Will you please give your opinion, as there is some of the plastering fallen down, and much more should be redone before painting?"—In reply: Without seeing the lease we cannot give a decided opinion. From what you say—"leave the premises in the same repair as when I took them"—it seems that you must leave them both outside, and in, in such repair.

DEVELOPMENT.—"PYRO" writes: "I am using a pyro soda formula as follows—pyro 1 ounce, citric acid 2 drachms, bromide potassium 2½ drachms, water 80 ounces, washing soda ½ pound, sulphite soda ½ pound, water 80 ounces. I have used this developer for years, and have found it answer excellently both in winter and summer. It gives, however, a very grey negative, and I have found recently that when using a certain brand of printing paper a slightly yellow negative gives a much better result. Could I alter the developer by leaving out either half the citric, or half the sulphite without interfering with its keeping properties? I think I should then get a more yellow negative. Or is there any safe method of making a negative slightly yellow without injuring it? I know pyro and ammonia gives a yellow negative, but I prefer soda."—In reply: We should recommend you to reduce the proportion of sulphite of soda, and leave the citric acid as it is. Its object is to preserve the pyrogallic acid while in solution.

RIGHT TO EXHIBIT.—"MIDLANDS" says: "I had an order to make enlargement of a portrait of one of my customers. When it done he did not like it, and would not have it though it was a g picture, and we had a row about it. I have put it into the win as a specimen. He now storms about it and threatens all ma of things unless I take it out. Can he legally compel me to so?"—In reply: Yes, certainly he can; you have no right to exh the picture. As he ordered it, you can, if it is as you say a g one, sue him in the county court for the money for it. But must not publicly exhibit it against his wish.

VISUAL AND CHEMICAL FOCI.—"OPTICS" writes: "Will you kindly plain how it is that in an uncorrected lens where the visual chemical foci are not coincident, how it is that in the vis focus the image is quite sharp in the blue and other chem colours, as I should have expected to find colours belonging one end of the spectrum sharp in one of the foci, and those the other end of the spectrum sharp at the other point of foc I plead ignorance on this subject, and shall feel greatly obli if you will enlighten me on it."—In reply: In an uncorrec lens the "blue and other chemical colours" are not in fo when the object is visually in focus. Any elementary work Optics will explain why.

DAMAGED LENS.—T. BLAGDEN says: "The other day I had an accide In taking a group out of doors I caught my foot against t camera stand and knocked it over, damaging the camera, wh can easily be repaired. But the jar has chipped a small pi out of the front glass of the lens. The lens has no maker's na upon it. Can you tell me where I can get a new glass put in at a very small cost?"—In reply: Unless you can find the act maker of the lens you will have a difficulty in getting t damaged glass replaced at a small cost. But as the chip small it will make no practical difference in the performance of t instrument, if you cover the fracture with a touch of black v nish to prevent reflection from it.

POTASSIUM CHLORO-PLATINITE.—"FRANK" writes: "About a month a I bought a tube of potassium chloro-platinite fifteen grai which I made up in a stock solution in ordinary cold water. T has now turned quite black. Is it fit for use, and how shou it be prepared for being kept in solution? I also made up platinum bath, i.e., stock solution one ounce, nitric acid one a three quarter drachms, water ten ounces; after using this the was a powdery sediment, but it still worked all right. Do y think the sediment would be caused by the P. O. P. "Carbona sold by John J. Griffin and Sons, Limited, or what?"—I reply: In all probability the water in which the salt was di solved was impure, or the vessel in which the solution w made was not chemically clean, hence the discoloration. W cannot say if it is fit for use. That you can prove for yourse by trying it. If all the platinum is not precipitated it may, doubt, be utilised, as in the case of that you find work a right, though discoloured.

STUDIO GLAZING.—S. H. ZORIAN writes: "A photographer friend mine in Syria, to whom I am accustomed to send occasional THE BRITISH JOURNAL OF PHOTOGRAPHY, and who is unable correspond in English, has this time written to me to ask you question on his behalf. His question is this—if I am plainly u derstood in my interpretation:—'Whether the colour of the gla used for skylight in the studio has anything to do with t atmosphere; or, in other words, in a country where the atm phere is always clear, bright, and sunny, and the fog is tota unknown, is it necessary to use the above glass in some darki or bluish colour, in order to moderate the effect of strong light the studio? If so, what colour may be more suitable? An further, are there any other colours of glass used in Engla or elsewhere for skylight than the ordinary ones?"—In reply Ordinary glass is what is usually employed in English studio If your friend thinks that the light with that would be too stron for him to manage in Syria, he might have ground glass, or th ordinary glass stippled over with thin white paint. Or, he migh have thin muslin, or tracing paper, fixed on light wooden frame to subdue the strong light.

THE SALE OF A CAMERA.—"HYPO" writes: "In August of last year, party had my detective camera on trial, with a view to purchase In November last I met him and he said, 'I want to make bargain with you re camera.' I agreed to sell it for 25s., t this he agreed, and said he hoped I didn't require the cash jus then, as he had a lot of sickness in the house. In this acquiesced. In February of this year he brings back the camera and says the shutter does not answer properly. I put it in order for instantaneous exposures when he had it first. I have got very good pictures with it, and hope to do so again. He offered me 2s. 6d. for the loan of it. I have asked him 10s. 6d., he says he will only give 5s. I have had to put the shutter in order, and this has cost me 9s. Do you think that I can claim the 10s. 6d.? I have lost opportunities of making something by it during the time he had it. It is an Aptus quarter-plate detective, cost between £2 and £3."—In reply: This seems a very trivial business matter to seek advice upon. If the camera was sold you are entitled to the money for it; but, surely you can arrange such a simple matter between yourselves. If not, you must seek the aid of the County Court.

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EX CATHEDRÂ.

The Professional Photographers' Association.

Nearly a hundred professional photographers—the largest gathering of the kind that we can remember—attended a meeting held at Anderton's Hotel, Fleet-street, on Thursday in last week, for the purpose of considering the desirability of forming an association to safeguard the interests of the profession. Besides London and its suburbs, Manchester, Stockport, Brighton, Hastings, Dover, Norwich, and Nottingham were directly represented at the meeting, which sat for nearly three hours, and passed off to the great satisfaction of all who took part in it. The results of the night's work were, indeed, most gratifying. The Professional Photographers' Association was formed, and a Provisional Committee was appointed to elect officers, draw up rules, and thoroughly organize a scheme for the administration of the Association. That committee will have to work with the utmost promptitude, for it will hold its first meeting on Thursday, April 11, at the rooms of the Royal Photographic Society, No. 66, Russell-square, London, W.C., at eight o'clock. Thus, within three weeks of its suggested formation the Professional Photographers' Association is an accomplished fact—a rapidity of result which in itself is a good omen for the future of the Association. The lengthy report of the proceedings, printed elsewhere in this week's Journal, will, no doubt, be read with great interest by the hundreds of photographers in all parts of the country, who have written us approving of the formation of a professional association. One point in that report may be singled out for notice here. The Provisional Committee has been appointed for three months only, that being thought sufficient time for the purpose of drawing up a working scheme. That scheme, it is to be supposed, will be extended on the lines suggested by the chairman of the meeting, and, such being the case, groups of country photographers will be formed into self-governing provincial centres, working in harmony with each other and with the London centre. But the scheme so far exists only in outline, and further speculation on the point is at present not of much use. The main thing is that the Professional Association has at last been formed, and that London photographers are anxious to co-operate with their brethren in the country for the purpose of making the Association a success. We attach little importance to the fact that a few "leading" men were absent from last week's meeting. In time, no doubt, these gentlemen will be induced to support an Association which, if it has been called into existence by the needs of the weak, may one day develop a source of power which the strong will not disdain in case of emergency. Anyhow, we feel sure that the support of the best-known London professional photographers is to be had for the asking, and we hope that the Provisional Committee will make a point of obtaining it at an early date. Nothing remains for us now but to hope that the start so auspiciously made last week will be the prelude to a successful career for the Professional Photographers' Association. It will be no light task to perfect the scheme of the organization on the lines mapped out; but the difficulties are not so great as to prevent the Provisional Committee, in the course of a few weeks, laying before their brethren in Great Britain and Ireland a comprehensive plan for the administration of the Association

which should secure the support of every photographer worthy the name. It goes without saying that the Association shall have all the help we can give it; and we wish it every success in the path of usefulness that lies before it.

* * *

The Forthcoming Eclipse of the Sun. Astronomers from all parts are proceeding to the West Coast of Sumatra to observe the total eclipse of the sun on May 18. It is not often that scientists have the opportunity to observe an eclipse of six minutes' duration, and that is the time of obscuration on the West Coast of Sumatra. In Mauritius it lasts for three minutes only—the same time as at Port Moresby, in New Guinea. In all of these places, however, the time is much longer than is generally the case, which is often not much over a minute and a half to two minutes. It is needless to say that great things are expected to be achieved during the six minutes' totality, supposing the weather is propitious. Unfortunately, in very many previous eclipses, it has not been, and the results obtained have been far from what was hoped for. May, it seems is a very rainy season where the eclipse is of the greatest duration; the average rainfall for the month is stated to be twelve or thirteen inches, and this does not incline one to quite hope for such successful results as might otherwise be anticipated. However, parties are proceeding to other points, where the totality is of shorter duration, so that it is hoped that what cannot be achieved at one place will be at another. It is only those who have taken part in eclipse expeditions who can fully realise the disappointment felt at their efforts being thwarted by the weather. Amongst the English astronomers at Sumatra will be Mr. and Mrs. Newall, of Cambridge, Mr. Dyson, from Greenwich, and Mr. Atkinson, who assisted in Dr. Common's expedition to the Norway eclipse in 1896, while Mr. Maunder, who is sent from the Royal Observatory, Greenwich, will be in Mauritius. It may be mentioned that one of the instruments from Greenwich is designed to give photographs on the scale of four inches to the sun's diameter. This, we think, is the largest size attempted at any previous eclipse.

* * *

Mr. Harry Furniss on Street Monuments. In his address at the opening of the Seventh Annual Free Picture Exhibition at West Ham, on Friday last, Mr. Harry Furniss took occasion to denounce in no measured terms our street monuments and statues. It is true that London cannot boast of a large number of statues, and it must be confessed that some of them are not of the highest artistic order. But such as we have we should desire to keep, at least, until we get better to replace them. And Mr. Furniss would have a committee, to be called "The Public Art Reform Committee," which should go over the whole country, and report upon statues which should be put underground, and not left above ground. He humorously alluded to the shortcomings of some of the London statues. For example, the equestrian one of the late Duke of Wellington, that used to be at Hyde Park Corner, in which the artist had omitted the stirrups from the Duke's saddle; also to one in the neighbourhood of Charing Cross, where the saddle on the horse was unprovided with a girth. Cleopatra's Needle, he thinks, should be on the banks of the Nile, and not on the banks of the Thames, and such-like comments. We imagine that few Londoners would like to lo Cleopatra's Needle from the Embankment, or indeed a of the comparatively few statues that London possesses. does not follow that because a statue does not possess a hi degree of artistic worth that it has no interest to the gener public. That, we know, is not the case, and such wor cannot be rightly considered as eyesores, except to tho who cultivate dislikes, and there are not a few who do s It is a too common thing for modern critics to deprecat and lament over, the poverty of English art, and too fr quently unjustly. Where is the work, whether by an o or a modern master, that some hypercritical being cann find some fault with, real or imaginary? What we prote against is the continual decrying of British art, and at t same time belauding that of the Continent, without sui cient reason in either case. The very works that ado temporarily, the exhibition at West Ham are sumcient justify our protest against this sort of thing. It is to hoped that the monument to her late Majesty the Quee which is to be in front of Buckingham Palace, will be su as will be beyond the reproach of carping critics, supposi there could be such a possibility!

* * *

Sunday Opening of Museums and Picture Galleries. The decision to open the Edinbur Museum of Science and Art on Sund afternoons is evidently not in accordan with the views of some of the good peo of that city. In a letter—which has appeared in the da press—to the Earl of Moray, who was one of the signator to a petition asking him to reconsider his decision to op the Museum on Sunday afternoons, Lord Balfour, Secreta for Scotland, replies, "In point of principle I am unable agree that a visit to a museum is a contravention of a Divine law. If a citizen of Edinburgh may not go to museum, by what right do any of us enjoy a walk in o own or somebody else's garden? In deciding the practi question, I think we must keep in view the extent of t innocent gratification, as well as improvements, offered those whose opportunities for both are otherwise limite London museums and picture galleries are opened for tain hours on Sundays during the summer months, and t are principally visited by persons whose avocations prev them doing so on any other day, and the privilege is grea appreciated by them, and no doubt the same will be case in the Modern Athens. The good people of Edinbu who do not approve of the step are not bound to go to t Museum on the Sabbath, but there seems no reason w others should be debarred from doing so, and that appe to be Lord Balfour's sentiment.

* * *

Art Exhibition at the East End. Another (the seventh) exhibition of l pictures is now open, free, at the Pub Hall, Canning Town. All lovers of would do well to visit it, even if it entailed a little travelli to do so. The success of these exhibitions amply pro that art is fully appreciated at the East End, though ma might have thought it would not be, or at least to t extent that it is. In the collection now on view are so of the best works of such men as Calderon, Vicat Cole, Wyke Bayliss, Lord Leighton, F. Walker, Sir Edwin La seer, and others. Most of the pictures are loaned from

te collections, and it is only on such occasions as this at they can be seen by the public, and therefore the opportunity should not be lost. We have just remarked that any might have thought that art would not be much appreciated in such neighbourhoods at West Ham, Canning own, Whitechapel, and other East-end districts, and they ould be somewhat warranted in that idea if they formed eir opinion from the photographs shown in some of the owcases in those districts. But that is a fallacy, as is oved by the numbers who visit these exhibitions during e short time they are open. It seems a pity that some the photographers in the district do not profit more from e exhibitions than they apparently do.

* * *

gs for bumenising per.

At the Greenwich Police Court, one day last week, a tradesman was summoned for selling eggs which were "unfit for the food man." It appears that the eggs were seized at a registered lodging-house, and the owner, an Italian, said he purased them of the defendant—172 for 1s. 6d. There was idea that the eggs were for making ice-cream. For the fence it was argued that they were not intended for the od of man, and that there was a large sale of bad eggs manufacturing purposes. Brown polish for boots was ade from the yolks, and the white of the egg was used albumenising photographic paper. At the present time ere is very little paper albumenised in this country; it is incipally done in Dresden, and new-laid eggs are not cessary; for this purpose, as for the albumen process on ass, good "shop 'uns" answer quite as well. In some ses the albumen, after separation from the yolk, is allowed ferment, or decompose, before it is used, as then it bemes more limpid, and is easier to apply, while at the same ne it gives a higher gloss. This accounts for the odour—t perfume—that some albumen paper possesses, particuly while being sensitised. It has from time to time been gued that prints made on this malodorous paper are not ely to be so permanent as those made on paper prepared th fresher albumen. The ground for this opinion is that e offensive odour is due to sulphuretted hydrogen, and at it must act injuriously on the silver compounds of ich the image is composed. But time has proved that nts made on this fetid paper are quite as stable as those nted on paper coated with fresh albumen. We have ny prints by us that we know have been done twenty-five ars on such paper, and they show but little signs of fading yet.

ORTABLE DARK ROOMS AND CONTRIVANCES.

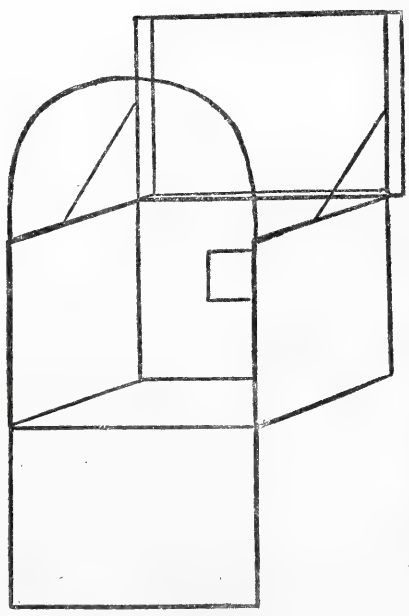
Those of our readers who possess an experience of photography reaching back to wet-plate days, will remember the portable dark rooms then provided for the use, in the field, of wet collodion workers; there were, of course, exceptions, but some of these portable folding appliances were excellently made, and by no means so heavy as might be imagined. This refers to the portable chamber itself, other paraphernalia made up the weight under which the collodion man habitually staggered. Looking through the years, and with every inclination to do justice to the very excellent and useful (in their way) contrivances, folding boxes and changing bags, which caterers for dry-plate workers provide in these modern days, we must confess to being unable to work up any enthusiasm in their behalf. That homely proverb about a fool and his money was brought to mind lately, when we heard that a "tyro" had recently patented a new portable dark room and changing box! Is it possible there can be anything new about such old-time apparatus? We may now and then purchase at sales some of these reminders of the olden time, but so far as the more modern variety is concerned, how seldom it is that we see them in actual or even passive use. Is it a question of money, or is it not that the articles themselves are too bulky or weighty? That they are an inconvenience can well be imagined — all such articles are in the nature of things more or less a nuisance.

The question of a portable dark room is not, however, without interest, and, albeit we do not forget that the number of fixed dark rooms has largely increased of late years, may well be considered by two classes of photographers—the hand camera man and cyclist, and, perhaps, with a little less reason, the tourist or traveller with more leisure and less incommoded by a small addition to, or re-arrangement of, his baggage.

The cyclist photographer carries a light camera with a reservoir of films or plates; in many cases the mechanism, however well designed and easy working theoretically, has an unhappy tendency to a break down or hitch at most inconvenient times and places, necessitating delay, and probably a rush to the nearest photographer's, where the impatient amateur may "cool his heels" until such time as the man in possession may permit his use of the dark room for the purpose of setting matters to rights. Of course, any dealer will meet the case in the usual way, and the obvious moral of the whole proceeding is, if these difficulties are likely to happen we should go prepared to grapple with them. Now we think that, with one possible exception, the existing arrangements scarcely meet the requirements; we want something more of the multum-in-parvo principle: the cyclist photographer is sufficiently burdened already, he can bear no addition to his kit, why attempt to load him further? Why not rather, before thinking of multiplying the paraphernalia, consider what improvement or alteration could be effected in existing accessories, to make him on occasions independent of other people's dark rooms. The one accessory which we think could be most readily adapted for the purpose is the cyclist's cape or poncho. Without the least interference with its legitimate object, this accessory, which every touring cyclist carries as a matter of course, might be altered to serve as a dark chamber whenever that condition is required as a mere temporary contrivance to meet an emergency in the changing of plates, or rectification of mechanism. The "cape" to be made entirely useful for both purposes of wear and camera work would require small alteration, and scarcely any addition to its weight, and no interference with its capacity for folding into a small compass. In an existing cape, if we insert a tape round the neck and another round the bottom edge, and draw these tight, we find we have all the space required in which a hand camera may be manipulated: having the space, we still require inlets for the hands, about which there can be

no difficulty. Many expert workers would be satisfied with this; it is not at all a difficult matter to change plates without visual assistance. With a full knowledge of one's apparatus and the packing of dry plates there is no real necessity to use one's eyes; but even supposing this to be an indispensable condition in a portable chamber, the addition could be made, as also a square of canary or ruby fabric inserted without any appreciable accession of weight —both these insertions would be covered by small flaps (to button down) of the same material as the cape itself, when not in use. Now, taking a reasonable view of the matter, while retaining to the full its efficiency as a covering for the shoulders, could not the cape be made to answer the two-fold purpose, always remembering that this is an accessory in every-day use, and practically a part of every tourist's machine?

Many years ago, in the early days of gelatine dry plates, anticipating a rather longer holiday than usual, we, with the experience of the wet-plate field kit to guide us, made in an amateur way a portable dark room and trunk combined, which, though long since consigned to the lumber room, served for several years a useful purpose. This portable chamber was a box measuring some 24×18×18 inches in length, depth, and height. The whole of one's apparatus—camera, stand, plates, chemicals, and a small set of dishes—could be packed therein. Arrived at our destination the box, unpacked of its contents, was placed upon a bench or table at a convenient working height, the lid set back and fixed with struts, the front lowered, and the two ends of a piece of thin iron rod bent to a semi-circle were inserted into holes provided in the sides of box, which then assumed the appearance of sketch below. A rectan-



gular piece of wood was unbuttoned and removed from the back, and a frame of coloured fabric put in its place. Ventilation, of a sort, was provided by a sliding panel of wood fixed to the lid, and having perforations in it to correspond to others in the lid itself. The illuminant was always outside the chamber. The ventilating slide is not seen in the rough sketch, but was in the lid by the hinged part, and this served also as ledge wherein to place a measure glass and bottles. A cover of black twill lining, double throughout, and held in place partly by elastic bands and by weights, rendered the chamber quite light-proof. When developing at night it was dispensed with. The whole arrangement was entirely a success, though somewhat roughly put together; but the idea, we think, was in the right direction. The photographic "kit" had to be packed for the journey, why not, therefore, pack it in the trunk which was to be the nucleus of our dark room? We have received, at various times, much courtesy from brother amateurs and professionals; the exceptions are, after all, extremely few, but there are times when the possession of a portable developing chamber is a real boon.

UNIFORMITY IN PRINTING AND TONING.

II.

In a previous article reference was made to a few expedients to which a printer may resort, in order to secure uniformity in a batch of prints, when they are being produced from one and the same negative. In numerous instances, however, a printer is called upon to produce a batch of prints for such purposes as exhibitions and show cases, &c., where each print has to be pulled from different negatives, and then the difficulty of securing uniformity becomes much greater than is the case where only one negative is concerned, for it is well known that hardly two negatives will be found to behave similarly unless the strictest care is bestowed upon the lighting and other stages in their production. In outside or landscape work, of course, the various factors are continually changing, and this class of negatives are seldom found so uniform as those produced under a studio light, and unless a printer be possessed of a considerable amount of practical knowledge of how to treat negatives strong in contrast from those of a weaker type, the resulting series of prints will, when brought together, show serious discrepancies in uniformity. Fortunately, however, a professional printer when dealing with negatives unlike in character, has some power to control the printing of them, so that they yield fairly uniform results. Towards this end, perhaps, nothing tends to assist a printer in obtaining good results more than a knowledge of how to ring the changes in the sensitising of his printing paper. In this respect the professional printer has a great advantage over an amateur worker, although the latter, if possessed of the requisite knowledge, may still be able to do much in the way of ringing the changes, even although he be tied down to the use of a commercial sample of paper, the production and sensitising of which he knows absolutely nothing about. With amateur workers, it may be said at once, that not one out of a hundred ever gives a moment's thought to the sensitising of the printing materials, and when it is desired to throw off a few prints, the usual routine with them is to procure a sheet or two, or a ready-cut packet of sensitised paper from their dealer; with this they proceed forthwith to treat all their negatives alike, the result being some print well, others only middling, and some quite chalky. No doubt a great deal of this sort of thing exists at the present day, when on every hand we see manufacturers and dealers catering so assiduously for the comfort of those who find in photography an agreeable and tangible pastime. Very different indeed from this was the

outine in the good old days, when every amateur photo-rapher, as well as professional worker, had not only to roduce his own printing material, but in a good many nstances had even to manufacture some of the chemicals equisite at that early period. Then it was that a much eeper insight was acquired by every worker, than is now ossible on the part of those who rely on others for the aterial they use, and who know practically nothing of the ature or the preparation of the material they are andling.

It has been truly remarked that not the least impor-ant branch of a photographic establishment is the print-ng department, where the head printer has to exercise so uch thought in dealing with the various defects and eculiarities found in negatives. Of the hundred and one ttle dodges, known only to a professional printer of wide xperience, amateur workers cannot be expected to know verything, for this knowledge can only be gained by those ho are regularly employed in the various branches of hotographic printing, and who have the opportunity of losely studying the proper treatment of the different egatives continually passing through their hands. In the ood old days when plain salted and likewise albumenised rinting papers were so much in vogue, not the least im-ortant factor in printing was the providing of a special uality of paper that would suit the class of negative which as being printed. In those days it was a well recog-ised fact, that no one sample of paper would suit every lass of negative. Of course, at that distant date, collodion as the chief medium employed in negative work. Now it a gelatine age, and though the requirements of the rmer differ widely from the latter in respect of the quality printing paper necessary to yield the best results with elatine negatives, still, hardly one amateur worker in hundred ever gives a moment's thought to the subject of inging the changes in the best form of paper to employ hen negatives strong in contrast have to be dealt with. o such it seems to matter not whether their negative be ver or under-exposed; the same commercial sample of aper is employed, and they are satisfied by obtaining st what such papers yield. If things go right the paper first-rate; if wrong, the negative is blamed, and they rest tisfied accordingly.

No doubt it would be too much to expect that the great ulk of amateur workers should know as much about rinting as their professional brother who has to earn his read and cheese at photography; but it is not saying too uch when it is stated that were those in charge of our arious photographic associations, which, in some locali-es, partake of the nature of photographic schools, and ho are well able to afford expert instruction for their embers, to regularly provide really useful and practical nowledge instead of the wishy washy "cauld kail het," so nstantly served up, the sooner would we see a deeper terest manifested in the production of the various print-ng materials our amateur workers are regularly using. o doubt all the leading brands of commercially sensitised rinting papers at the present day are most excellent so ar as they go, and the various manufacturers deserve the reatest credit for the perfection to which they have rought these modern printing papers — a degree of erfection undoubtedly much in advance of what formerly as the case with commercial samples of albumenised paper, so prolific in blisters and other defects in days gone by; but the fact remains that but few amateurs are possessed of the requisite knowledge and experience to know how to ring the changes with these modern samples of papers upon negatives of varying degrees of density and gradation—this lack of knowledge and experience being clearly attributable to the ease with which such workers can obtain their printing materials on the one hand; whilst on the other, there is no provision made by the great majority of our photographic associations to provide a thoroughly technical instruction by competent teachers to their members. In former times one of the first lessons a professional printer had to learn was the sensitising of his own paper, and in this not only had he to exercise discretion in providing and keeping his sensitising bath at a uniform strength throughout the entire operation of sensitising a large quantity of paper according to the special salting of the sample being used; but, he had also frequently to provide a class of paper specially suitable for those negatives which were too strong in contrasts to be printed by the paper sensitised with the ordinary strength of silver bath. In many instances this meant employing a bath of much less strength than what was termed the normal, the main factor in the operation being that it was a well-recognised fact that when negatives with strong contrasts had to be printed, a weaker sensitising bath had to be provided to suit their requirements, and by such means a surprising amount of improvement was effected. Compare with this the present-day procedure, where an unknown sample of ready sensitised paper is being used for all sorts of negatives, and it will at once be obvious that unless the printer be possessed of the requisite knowledge of how to modify such modern samples of paper so as to suit the ever varying negatives he is called upon to print, the results cannot possibly be so satisfactory as they otherwise would be when provision was made for printing the negatives with the class of paper most suitable for their peculiarities. To obtain uniformity in results by treating a chalky negative by many of the well-known dodges whereby the shadows are delayed until the high lights gain sufficient printing density—almost every hand-book on photography dwells upon the importance attached to this mode of treating a negative. But here is a method of doctoring such negatives which, so far as we are aware, has never appeared in any hand-book on photography. This treatment consists of subjecting the film to the action of a dye, as is practised in some branches of process work. A little consideration will show any one that a gelatine negative consists in varying gradations of metallic silver to almost pure gelatine. The high lights in negatives of the description under consideration consist almost entirely of metallic silver, which, of course, is very slightly susceptible to the action of a dye. On the other hand, the shadows being almost pure gelatine have a much greater affinity for such, so that after a negative has been dried and tested, if it be found to yield unsatisfactory results, by steeping the same for a length of time in a suitable coal-tar dye of bluish-green tint, the shadows will be impregnated with the dye to such an extent as to retard their printing, whilst the metallic silver will be scarcely affected. A little practice will enable a worker to gain much from this mode of treatment.

FOREIGN NEWS AND NOTES.

A School for Photographers at Munich.—Munich, the German Athens, has the distinction of being the first city in the Empire to provide a school for the education of portrait photographers. During the past few years a movement has made itself apparent in Germany for the cultivation of photography as an art. It is reflected in the photographic periodicals, and visitors to the larger cities may have noticed that photographers are endeavouring to impress their portraits with some individuality of style. The Munich School is the outcome of a report made to the Bavarian Government by G. H. Emmerich, who now directs the establishment, and it speaks well for the earnestness and forethought of German photographers that the sum of 1500*l.* was subscribed by them and others of the craft, including the members of the South German Photographic Society, towards the necessary funds for starting the institution. A temporary building belonging to the city of Munich has been granted to the institution for a period of five years. From the illustrations in the January issue of the *Photogramme* it appears to be well fitted with modern appliances for the instruction of the students. The rooms comprise a studio, laboratory, printing and retouching rooms, library, class rooms, &c. A collection of photographs and works of art is also in course of formation. The course extends over two years, and comprises instruction in organic and inorganic chemistry, photographic processes, drawing, optics, posing, lighting, &c., landscape photography, and photo-mechanical processes. Unfortunately last month a fire occurred at the school through the over-heating of a stove, and the director's room and a valuable collection of lenses and instruments were destroyed. The school course will not, however, be interrupted by this accident.

The Velocity of Light.—In the *Central Zeitung für Optik und Mechanik* we notice that Monsieur Perrotin, the principal of the Nice Observatory, has made fresh experiments for determining the velocity of light. Monsieur Bischoffsheim, the founder of the Observatory, generously subscribed the necessary means. Fizeau's method was used. A beam of light was projected through a telescope at one station upon a telescope at a second station, and returned through it to the first telescope by a mirror. By turning a toothed wheel at a definitely ascertained speed the time taken for the double journey was ascertained. The two stations selected were Nice and Gaude, and their distance from each other was ascertained trigonometrically within $\frac{1}{10}$ metre. The distance was rather less than twelve kilometres. The experiments extended over a year and were made on perfectly clear, calm days only. 1480 measurements were made, and from such a number of observations it may be assumed that the result is of exceptional exactness. The velocity was found to be 299,900 kilometres per second. This is 11,000 kilometres less than Olaf Römer's calculation. As the result of these fresh measurements does not differ much from those made by Michelson in 1899, by means of Foucault's rotating mirror, M. Perrotin's work receives additional confirmation.

The Speed of Plates and the Strength of the Developer.—Dr. R. E. Liesegang thinks there is a possibility of reducing exposure, which is equivalent to increasing the speed of the plate, by the discovery of a more energetic developer than any we have at present. This idea is suggested by the following considerations. An extremely slow emulsion, which has not been ripened, may require an exposure of twenty seconds for development by any of the dry-plate formulæ at ordinary strength, but if a more concentrated developer be used, such as for Velox or similar papers, the exposure may be reduced by half. The colour of the image also depends upon the strength of the developer, being warmer when the solution is more dilute. The addition of bromide produces the same effect, and is resorted to for preserving the clearness of the high lights of lantern slides. The tone, however, is affected and the blacks are less pure. If this be true for slow emulsions, why not also for the more rapid? The warm colour, obtained by development with diluted solutions, may be due to the surface of the coarser particles of silver bromide being reduced, whilst a more concentrated developer has greater penetration.

A New Method of Reproduction.—According to the *Moniteur de la Photographie*, M. Alberini has discovered that asphalt becomes soluble in alcohol and in water after a long exposure, and by this process it is possible to reproduce from a positive, a positive cliché. The process is to coat zinc, as generally used for photo-zincography, with a seven per cent. solution of asphalt in benzine of sp. gr. 0·70, and allow to dry. When dry, the surface of the zinc is a pale golden colour. The exposure is very long, under a transparency ranging from two to three hours, whilst under a tracing on paper it runs from five to six hours in the sun. After exposure the plate is placed in a dish containing forty per cent. alcohol, and after a few minutes the plate is gently rubbed with a pad of cotton-wool, which should be frequently renewed, till the design or drawing appears intact on the surface. After development the plate should be rinsed under a tap of running water till all greasy marks disappear, and then etched in a two per cent. solution of nitric acid for about one minute and then removed, and the nitrate of zinc cleaned off with a sponge and the plate again etched, and this may be repeated three or four times. Printing is, of course, done as usual.

The Purification of Acetylene.—According to one of the German papers, the best method of purifying acetylene gas is to pass it through a solution of cupric chloride acidulated with hydrochloric acid. A litre of this solution is sufficient for fourteen cubic metres of the gas, and after use the solution may be rendered fit for use again by simply heating. It has no effect upon the gas except that of purification, and by this means the very worst samples of impure carbide may be rendered usable.

The Gum-Bichromate Process.—The Comte d'Osseville gives in the *Bulletin de la Société Caennaise* the following simplified plan of preparing paper for this process. Good stout paper should be immersed for two minutes in a ten per cent. solution of bichromate of potassium and dried in the dark. It should then be given an even coating with a ten per cent. solution of gum arabic to which sufficient of the desired dry water-colour has been added to give it about the depth of colour of an ink. It is advisable, after coating the paper, to equalise the coating with a large hair softener and then dry in the dark, and it can be exposed under the negative in the usual way for from fifteen to twenty minutes, and then place it in a dish filled with water and, keeping the print submerged, lightly brush the surface with a soft brush till the image appears, then rinse and allow to dry.

Calculating the Effective Aperture of Lenses.—M. de Merona, in the *Photo Revue*, gives the following formula for calculating the true effective aperture of any lens when the following constants are known:—

f = the equivalent focus,
f_1 = the focus of anterior lens,
f_2 = „ „ posterior lens,
d = the diameter of the diaphragm;

then

$$x = d \times \frac{f f_1^2}{f_2(f_1 - f)^2 + f_1 f^2}$$

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A LARGELY attended meeting of professional photographers was held on Thursday, March 28, at Anderton's Hotel, to consider a proposal for the formation of an Association under the above name, Mr. Thomas Bedding, F.R.P.S., in the chair.

Among those present at the meeting were Messrs. H. Walter Barnett, F. A. Bridge, Alfred Ellis, William Grove, J. Lillie Mitchell, G. Ridsdale Cleare, John G. Williams (East Molesey), W. Plumbe (Maidenhead), H. E. Hull, F. Downer (Watford), Fred. Coop, C. A. Walker, Lang Sims, Edward Simpson, Albert England, James Rigden, H. Hallier, H. J. Godbold (Hastings), H. Hett, W. Race, W. Moorhouse, Frank Wakefield, T. G. Fisher, C. Rutter, J. Emberson, C. Bailey, R. Beckett, Edgar Wilkinson (Norwich), J. Hubert, O. P. Suisse (Brighton), W. Coles (Watford), A. G. Lewis (Stockport), J. Done (New Barnet), A. Whiting, E. Milner, S. H. Fry, C. Herrmann, W. Edward Wright, H. J. Dalby, G. V. Simmons, F. Chambers (Manchester), Ernest Wood, R. Leonhardt (Nottingham), C. Olley, W. H. Robinson, Walter Morice, H. J. Rigden, E. T. Gibbs, A. Koeppen, A. Corbett, R. H. Ellis, C. Vandyck, R. Dimberline, R. Ritchie, E. Spencer, T. F. Dowdall, E. Sewart, A. Coop, W. F. Court, A. J. Bailey, T. J. Beckett, F. Wykeham, W. E. Tutt, and many others.

Letters and telegrams of support from the following professional photographers were laid upon the table:—W. Barry (Hull), J. W. Tattersall (Accrington), Christian (Peterborough), Gardiner (Worthing), Robert Frost (Loughborough), W. Crooke (Edinburgh), H. Van-

ck (North Kensington), F. Whaley (Doncaster), W. Blake (Bedford), Wood (Jarrow-on-Tyne), W. Mitchell (Selkirk), C. Spence (Dunr), F. Everitt (Cradley Heath), W. Thorneycroft (Newport Pagnell), arold Baker (of London), F. MacMahon (Inverness), W. uncey (Dorchester), W. McLean (Hunstanton), Evans (Ludlow), . A. Parsons (Altrincham), F. H. Sanderson (Cambridge), S. H. eenway (Northampton), A. Seaman (Matlock), G. Morgan (Aberen), J. T. Simmons (Salford).

The Chairman, in opening the meeting, said: This pile of papers—ters and telegrams—is from gentlemen in all parts of the kingdom o have written to say that they cannot be present here to-night, but sympathetic with the idea of forming an Association of Professional otographers. I think that your movement should derive much profit the moral effect of this batch of approving literature. I have also ist containing the names of, approximately, two hundred photoiphers in England, Scotland, and Ireland, also approving of the ne idea. I will not read these letters or this list, as we have eady much work before us. In contravening what is the usual ctice of public meetings, and moving myself into the chair, for that what it amounts to, I beg that you will excuse me for doing so, but elt that, as I have watched the growth of the movement from the ide, as it were, it would be for your own convenience if I occupied s position to-night, and, of course, to-night only. It should, prolly, be occupied by a professional photographer. It will, I think, for your own convenience if I outline as briefly as possible what is we propose to do to-night, and what I hope you will do. You aware that this meeting has been called to consider the desirability forming an association of professional photographers for mutual tection and interest. I shall lay before you a brief statement of grounds upon which it seems desirable that the association should formed. After that it will be competent for some gentlemen here night to give me a resolution that such an association be forthwith ned. That resolution will, I hope, be seconded in the usual formal nner, and upon that resolution the main discussion of the night will e place. Allow me to guide you as to the nature of that dission. I would suggest that it be as general as possible, that it uld not particularise individual firms who have recently loomed ner prominently in the photographic eye. I look to this discussion elicit and elucidate a large number of practical suggestions which ll guide the committee, if a committee be formed, in directing affairs of the association. Now, when we have got rid of that lution, to be, I hope, unanimously passed, we shall proceed to the tion of officers—a Chairman, a Vice-Chairman, a Committee, a retary (honorary or paid or both), and a Treasurer, and consider a ting place. That will take us to the end of the necessary formal iness; but, of course, other matters must inevitably arise in the rse of the discussion. When we have got to the end of that formal iness, if it is the wish of the meeting, we might take advantage of tting opportunity of passing some protest or the other. This is a gestion. It may occur to somebody in this large gathering that ain recent actions of certain firms, which have led to this meeting, uld be referred to by so representative a meeting. I do not w whether you have followed as closely as I have much that has peared in the mass of published correspondence. The man at a ance, say 100 miles, cut off from this great centre of civilisation, pleaded very hard that London, in the persons of its chief repreative photographers, should take the lead; that these gentlemen ondon should show their brethren in the country that they are in pathy with this nebulous movement, which, I hope, will crystallise ght; that they are in direct sympathy with them. I am speakfor the benefit of literally hundreds and thousands of photographers listant parts of the country, and I am very pleased to be able to that prominent London photographers have evinced the utmost pathy with this movement, and a strong and earnest desire to it. Within the last few days I have taken it upon myself to ult half a dozen men, whose names are renowned wherever photohy is practised, on the steps to be followed in drawing up this me. I am happy to say that these men at once came forward their ideas and offer of time, and are anxious to help this movet by every possible means in their power. I allude, in particular, Mr. H. Walter Barnett, Mr. Alfred Ellis, Mr. Lyddell Sawyer, Harold Baker, and Mr. F. A. Bridge—a small, but very able, band rnest London photographers, and as a result of their good example a greater number of prominent men will join this Association later on. t trades, professions, or industries have associations whose main ct is to guard the interests of their members or professors. Photohy is a conspicuous exception to this rule. Photography, unlike professions, has little or no legal status. In virtue of an Act of iament, in 1862, relating to artistic copyright, photography pos-es (and this is commonly overlooked by most photographers) artistic status. The photographer is ranked with the otor and the painter, and I, for one, sincerely hope that it will be before he is robbed by the Legislature of this pleasant, if not profitable, privilege. With this exception the Legislature does take cognisance of the photographer. The consequence is that in combined or concerted action that it may be desirable to take, he t rely upon his own resources and not upon the Legislature. The recent manifestation that has taken place points to the desirability of once and for all starting some such Association for mutual benefit and interest as has brought you gentlemen here to-night, and perhaps the need, I may say the urgent need, of such an Association will be brought home to you more vividly by a brief recapitulation of the respects in which the photographer is often placed in difficulty, than by any other means, particularly a sentimental one. An Association of Professional Photographers formed for the purposes of protection would naturally watch over all Parliamentary or public actions affecting their interests. That goes without saying. It is its first duty. Photography and photographers are often dealt with by public bodies, municipalities, &c., and it is quite conceivable that little questions of professional practice may arise in which it is highly desirable to have the assistance and support or advice of some central, or at any rate generally large representative, body. Again, those of you who are employers of labour may come within the scope of the Factory Act. It is quite conceivable that the administration of this Act may bring you into temporary conflict with the powers that be, and it is eminently desirable that you should be able to refer to some representative organization that can help you in the way that may seem desirable. An important item is the question of fire insurance, and it seems to me that this little point offers considerable scope for the attention of an Association such as, I hope, we shall form to-night, in the getting of fair treatment from the companies dealing with this class of business. It has been suggested to me that the old idea of a Benevolent Association might be resuscitated, and a new fund formed. I have no immediate hope that anything can be done in this direction yet, but it is a ground for possible action in the future. To relate the cases of terrible urgency and tragedy that I have come across, calling out for the help of a Benevolent Association, would harrow you too much, but such a body as your proposed Association, it seems to me, forms the best agency for tackling a question like this. Then there is that very important point—the right to the negative. This right is constantly placed in jeopardy. It is conceivable that you may wake up one morning and read a decision in the paper of some local or other court the effect of which will be to temporarily deprive the photographer of all right in his negatives. Let me give you an illustration. Eighteen months ago there was a case in the country before a County Court Judge involving a dispute in regard to the transfer of a business, and the negatives were claimed from the photographer as the property of somebody else. The judge appeared to be taking the view that these negatives were not the property of the photographer. However, he was induced to withhold his decision, and two or three people wrote to me about this particular case. I happened to recollect that a number of decisions in this matter had been given; these I looked up, and had an article printed. The article was sent down to the judge, and upon this article he gave a decision favourable to the photographer. This was a happy accident. There might not have been a good memory to bring to light these previous decisions, but I instance this point to show you how close is the danger in this vital matter. There is also the apprenticeship system, which is constantly in an unsatisfactory condition or position. Cannot this question also be adequately dealt with by a body like ours? There are also many customs in the profession which, it seems to me, ought to be, and might be, put on a uniform basis. The relations of employers to assistants might come within the scope of this Association. We are getting on to delicate and painful ground to many of us, I fear, but the regulation of prices, the prevention and avoidance of "cutting"—that terrible thing—requires your attention. Mr. Broadhurst, the labour leader, in the House of Commons, once referred to "the demon of cheapness," a most expressive description of that unholy thing which seems to deceive so many in your ranks. At some future date I suggest, as an ideal work for an Association of this kind, the adoption of a system of minimum prices for various kinds of photography. We now come to "gratis photography" — taking photographs for nothing. You have all read your "Pickwick Papers," and in it the trial of the action—Bardell versus Pickwick. You will remember that it came out that the solicitors for Mrs. Bardell—Messrs. Dodson and Fogg—had taken the case up on "spec." Well, a lot of photographers take photographs on "spec," not because they want to do business in this way, but because this unholy competition forces them to do so. I suggest that this, again, is a legitimate matter for internal legislation by a professional photographers' association. We come next to a very regrettable phase of modern photography—the swindles. How often is that blot on us, the imposition of a bromide print for a platinotype upon an unknowing public, going to last? Is there any defence for such a dishonest course? The moral pressure of this Association will, I hope, put a stop to the infliction of these things on your patrons—the public. I give it as an example of the malpractices that should be stamped out of an honourable profession. (Cheers.) Many photographers, especially those in the country, are also dealers, running a great risk in the sale of poisons. If you read the papers containing the reports of the Pharmaceutical Society's proceedings, you will realise how very grave these dangers are. An innocent photographer supplying twopennyworth of bichloride of mercury renders himself liable to be hauled up before a magistrate and there

condemned in a penalty of £5. The photographer has quite as much knowledge as the chemist of the properties of bichloride of mercury, and there is no reason why he should not comply with the simple demands of the law as well as a chemist—enter the sale in a book and take the purchaser's signature. An Association such as yours should take an active part in this question, because at this particular time the Pharmaceutical Society is being opposed by a Society whose aim it is to throw open the sale of these poisonous compounds to legitimate traders, or, in other words, to remove from the Pharmaceutical Society the power of persecution of harmless people which they now possess. Only ten days ago, in Dublin, three photographers —Messrs. Lafayette, Smyth, and Laffan—were fined at the local courts for offences such as these. I think that a representative Association like the one proposed could deal excellently with the matter. Then there is the invasion of Monsieur Tanqueray. The whole of Great Britain has been papered by these industrious people of Paris, who sell their pictures by methods which are hardly to be considered as ideal, from the commercial point of view. They proceed on a geographical basis, taking a town and its directory, and sending over these circulars by the vanload for distribution. Such an Association as yours, by addressing the press, could do much to lighten the public as to the true nature of such schemes as these, and I hope it may be taken up. There is still another point—the misleading advertisement, which is becoming so common that it must put the backs up of all photographers. I allude to those stupidly mendacious things, such as the "bromide enlargement for 4s. 6d. that would cost at an ordinary photographer's £5 5s." All I can say in comment is—Does he not wish he may get it? In recent years there has been a growth, a strong growth, amongst photographers of a desire, and a legitimate desire, to be dealers. Some photographic businesses, I am sorry to say, are in process of extinction, and the photographer naturally looks to the readiest means of keeping his head above water, and he takes to the sale of photographic apparatus and materials. In doing so, however, he occupies a very curious position, a dual position. He needs to be protected in the position of trader rather than photographer, because, so far, he does not seem to have established the same right to dealers' terms as a chemist or a toy-shop keeper, or a stationer or a butcher, baker or candlestick maker, who may elect to take up the sale of these things. The photographer, a man of skill, knowledge, and practice, who not only can tell, but has to tell, his customers how to use their apparatus and make their prints, is deprived of all such privileges as those I have alluded to. It is a matter which might very well come before this proposed Association, the more particularly because, from a computation I have been making this afternoon, taking the approximate number of photographic businesses in this country as four to five thousand, I estimate that professional photographers in this country purchase photographic supplies to at least £500,000 worth in a year. Professional photographers spend all this in photographic materials, and yet they have no voice in the terms they may get. Let it be the business of this Association now, or in the near future, to take up this matter for consideration. I only wish to briefly outline some of the things you may do. My suggestions are not of a formal nature. The gentlemen to whom I referred earlier in this address met me the other evening. I went through the scheme with them, and they were good enough to make several suggestions, such as seemed to them to be desirable. It was considered that the title of the Association should be "The Professional Photographers' Association." It is succinct, and everybody knows what it means. We thought it well to drop "national;" the phrase "United Kingdom" belongs to the Convention; and "Great Britain" to the Royal Photographic Society. So having been cut out in these several directions, it is suggested that the severe simplicity of the "Professional Photographers' Association" would meet the case. It was thought that the objects of the Association should be expressed in the briefest and yet most comprehensive way, namely, "To safeguard the interests of photographers." That, from the photographic point of view, surveys the whole world, from China to Peru. Again, it was the feeling that this should be a masters' association, not one for assistants, and that it should be open only to those engaged in business as professional photographers. A little later on you will have an opportunity of offering suggestions for modifying these ideas if you so desire. The subscription, we thought, might be placed at 5s. per annum. Such an amount is nothing to a big man, and it will not hurt the little man. Half a guinea is more considerable, and one guinea to many is wealth beyond the dreams of avarice. Five shillings, therefore, was thought sufficient to meet the case. And now we come to the most important part of this idea, or scheme. As I said at the beginning, it is the man at the distance, the country photographer who, taken in the mass, is more interested in a protection society than the Londoner. London, taking a seven or eight miles' radius, includes some three hundred photographers. The rest of the country has as many as four thousand. The best, most successful, and lucrative photography is done in London, and a man living in this great city has an opportunity of holding his own, which is denied to one afar off, who is out of touch with this centre of modern civilisation. I should, therefore, look to this Association to be of far more use to the man at the distance, the man who cannot meet his confrères as you are doing now, the man who is cut off and isolated in far provincial towns. Our idea is that there should be a number of provincial centres, existing not quite independently, but in permanent touch with the central body. Let us take the case of Ireland. It naturally divides itself into two fields of work, the North and the South, and Ireland might therefore very well be divided into two such sections. Take the case of Scotland. We should have an Edinburgh centre on the East Coast; a Glasgow centre on the west, and a Northern centre, or at most three or four local sections. I should like here to draw your attention to the striking action of some of your country brethren. Aberdeen gathered immediately and formed a little association amongst themselves, and said we want to be part of you, we want to form part of a professional photographers protection society. Again, I have a letter from Hastings, where Mr. H. J. Godbold roused up the local photographers, who joined forces and formed an association for themselves. Other cities and towns are animated with the same idea, so let us, say, form local associations, or sections, which shall be in touch with the central London body—decentralisation, or, as Mr. Gladstone would have called it—Home Rule, should be your aim. We will now take the case of England, which must be split up into some six or seven centres —(1) London, (2) the South, (3), the Midlands, (4) The West, (5), the East, and (6) Lancashire and Yorkshire and the Northern districts. The letters and telegrams that have come to me from all parts of the country are very enthusiastic in their nature. They show that you have already the raw material from which to form your local and provincial sections. With such an organization it will be a very easy thing for these men to meet, elect a chairman and secretary, and be guided by a set of rules drawn up in London as to the main lines of the policy to be observed. They will hold meetings, perhaps once a month, and, as occasion may arise, get into communication with the London body; and the chairman and secretary of each section may be members of the Central London Committee, their mere election as chairman and secretary being equivalent to an appointment to a seat on this Central Committee. It should not be left to the London members to propose Mr. Smith and Mr. Brown, but let the men actually concerned meet and appoint their representatives, so that all may have a voice in the administration. This, I think, is the most important part of our programme, and its adoption is very likely to conduce to the support and welfare of the country photographers, and make of them one great harmonious whole. A desirable sympathetic feeling for one's brother photographers in distant parts must be the outcome of such an union, and it seems to me that the scheme proposed affords a simple, inexpensive, and not difficult mechanical process of doing more to raise the status of photography than any Act of Parliament whatsoever. Give to photographers in every part of the country a common interest, and let them see the great future that is wrapped up in such an idea as we are now unfolding, and I have the greatest faith that, if the Committee carry out the scheme on broad and intelligent lines, there must result an immense amount of good to the photographs of these islands. We now come to the election of officers. I would suggest that you rely altogether for the rules upon the Committee you appoint. These should not be very formidable, but they may take some time to draw up. That Committee should relegate the matter to a Sub-Committee, two or three should be ample, who could do the whole thing in a much shorter time, guided by previous example, and guided also by what existing institutions are doing in a similar way. There never has been, to my knowledge, my personal and historical knowledge, such a great and favourable opportunity for forming such an Association as this, and I beg you, personally, most earnestly not to miss it. Do not be deterred by the cold water thrown by some upon the scheme. Take the chance offered by fate—or Ogden—and stick to it. Let every man here to-night be a missionary to persuade his confrères to join your movement; stick together, and show the man at the distance that you are earnest in this work, and I am persuaded that from this night we shall be able to date a new era in professional photography. (Loud cheers.)

Mr. Robert Beckett (Hackney) said he was a great believer in the motto, "Better late than never." Photographers, he was glad to see, were bent on doing that night, so far as could be judged by their applause, what should have been done many years ago. The grass had been allowed to grow under their feet by inaction, with a loss of prestige, trade, and influence, and much more. As a photographer himself, he had felt the pinching boot on his corns, and it was therefore with great pleasure that he proposed "That the Association suggested by the Chairman be formed, and at once."

Mr. J. Hubert said he had great pleasure in seconding the proposition. He thought that the best thanks of the profession were due to the Chairman for his courageous attitude in pushing forward the scheme unfolded that night. Photographers, as a body, were backward in coming forward, but he hoped that the outcome of the meeting would be an unqualified success for the new Association.

Mr. J. Done asked whether trade photographic printers and enlargers might consider themselves at liberty to join this movement?

The Chairman, in reply, said he could only put before the meeting the definition arrived at by the meeting of the little band he had

referred to, viz., that the Association was one for persons engaged in business as professional photographers. It was a subject that possibly the meeting might like to discuss.

Mr. Samuel J. Beckett thought that so long as a man was engaged professionally as a photographer, the fact that he carried on other business should not deter him from membership of the Association.

Mr. R. Dimberline suggested that this question be thought over once more minutely by the Committee to be appointed, and their report submitted to a general meeting.

The Chairman commended this view of the matter to the meeting.

Mr. F. Chambers (Manchester) spoke in favour of the scheme before the meeting. He had interviewed several photographers of his city, and could say that they were in entire sympathy with the movement, and would support it.

Mr. J. Done said that he was present at the meeting at Birmingham ten years ago, when another association that had since come to grief, was brought into existence. The time had not then arrived for the successful flotation of such a society, the only outcome of which had been the combination of the chief photographers for the purpose of getting a royalty fee from newspapers reproducing their photographs. He thought the time had now come when they, as professional photographers, should combine. The manufacturers had combined, and the retail dealers had combined. He considered that a Professional Photographers' Association would be able to do a great deal in regard to the question of dealers' terms with the Associations already formed, and better terms secured as a result for the professional photographer. The copyright question also might be taken up and watched with advantage. One of the objects of this Association should be to endeavour to raise the status of photography to that which it had twenty years ago, before cheapness came and ruined everything. It was only by an Association that could use a strong moral influence upon other photographers to get them to combine that prices could be raised to an extent that would afford a living profit.

The Chairman thereupon put the motion for the formation of the "Professional Photographers' Association" to the meeting, and the same was carried nem. con.

The Chairman then said that it was the duty of the meeting to appoint a Committee and officers. He hoped to see a large and influential Committee appointed, the prominence of which would have a great moral effect on the country at large. These gentlemen, with the representatives from the provincial centres, would be able to exercise a far-reaching influence, and their names should therefore carry considerable weight. Then it must be remembered that a good secretary would be the making of the Association. He was happy to say that his friend, Mr. Percy E. Marshall, had kindly consented to act for them as Honorary Solicitor. (Cheers.) With regard to a permanent address, the Association did not want a building or a flat of itself. He had spoken to the President of the Royal Photographic Society quite informally, and had suggested that if this Association were formed the Council of that Society, of which many members were present, might grant the use of its magnificent rooms for the annual or any other meeting that might be called. At the same time it would be necessary to have a permanent address at which the secretary could be written to.

It was proposed by Mr. A. Mackie, seconded by Mr. F. A. Bridge, and carried nem. con., that the Committee only be appointed that night, the election of officers being left to such Committee.

Mr. Rigden (Bowes Park) argued that the Central Committee should not be solely of London men. His idea was that London should not be empowered to dictate to the provinces.

Mr. J. Done suggested that the Committee to be appointed should be only pro tem. He did not want to see the power get into the hands of a clique, but wanted all classes represented.

Mr. J. Hubert supported the last speaker. There should be no suspicion of a clique.

The Chairman said that the matter was so entirely in the hands of the meeting that theirs would be the fault if any such thing occurred.

Mr. H. W. Newton (Kingston) urged that strong men were wanted, clique or no clique.

Mr. J. Done finally moved that the Committee consist of twenty-five members, and that it be elected for three months.

Mr. H. J. Dalby (Woolwich) seconded the motion, and the same was carried nem. con.

The Chairman thereupon called for the names of those gentlemen to be appointed the Committee, reminding the meeting that the main idea should be to inspire confidence in the country photographer who was asking what London was going to do in the matter?

The following names were thereupon proposed:—H. Walter Barnett, A. Bridge, Alfred Ellis, Harold Baker, Robert Beckett, H. J. Dalby, Alexander Mackie, William Grove, G. R. Cleare (Hackney), J. Done, W. Morice (Catford), F. Hollyer, R. H. Ellis (Sutton), H. Hull, W. G. Parker (Holborn, London), E. Milner, W. Edward Wright, Lang Sims, H. W. Newton, E. D. Lavender (Bromley), Howdall, Green, H. Hallier, Gibbs.

Mr. Newton proposed that only those who are engaged in business as professional photographers for themselves be elected to serve on the Committee.

Mr. Coop seconded the motion, which was agreed to, and certain names of employees were thereupon struck out, leaving the names given above.

Mr. Done agreed to alter his motion so as to allow of the election of twenty-six on the Committee, and, the same being agreed to, the Committee as above was declared duly elected.

At the request of the meeting, the Chairman consented to convene another meeting after Easter, but not as Secretary, or in any official position.

Mr. Newton proceeded to make a few remarks about the immediate cause of the calling of this meeting, namely, the action of Ogden and the Sunlight Soap people. He had been in correspondence with Messrs. Lever, from whom he had received every courtesy, if not much else. He believed that, if these people were properly approached, with evidence that photographers had a real grievance against them, they would be quite prepared to meet them. It was absurd to think of stopping people from trading as they might wish, but if a real grievance were shown, they would, he thought, remove it. He should therefore favour the framing of some resolution embodying a protest against the action of these two firms, and thought that if it were sent to them some good might come of it. He therefore definitely and formally moved the following resolution:—"That this meeting of the Professional Photographers' Association desires to enter its protest against the photographic advertising methods of Messrs. Ogden and of Messrs. Lever, as being prejudicial to the interests of the photographic profession."

Mr. H. Hallier thought something should be done to put a stop to these practices. There were many ways of advertising without taking up photography in this way, the workers in which could little afford to face this kind of competition.

Mr. E. Milner suggested that the real beginning of the whole trouble was to be found in the ranks of photographers themselves. There were many firms who had pressed, urged, or forced these cheap reproductions upon these firms. The thin edge of the wedge was the cheap reproduction of celebrity portraits, which ten or fifteen years ago fetched 1s. 6d. The minimum had become the maximum. Photographers ought to combine to stamp out the firms who engaged in this work, and keep them from this Association.

Mr. Dimberline had pleasure in supporting the resolution, and added his own testimony to the harmful effect the practice would have if continued.

Mr. H. J. Godbold also supported the protest. He read some correspondence that he had had with Messrs. Lever, who had replied. From Messrs. Ogden he had failed to get a reply. The photographers of Hastings and neighbourhood had combined to send a protest, which he proceeded to read from THE BRITISH JOURNAL OF PHOTOGRAPHY for March 29. In reply, Messrs. Lever stated that, as they had previously pointed out, they were convinced that their photographic enlargement scheme was not likely to injure local interests. They said that they would regret any such injury very much, but that they considered photographers took a wrong view of the matter.

Mr. Bailey seconded the motion, which was carried unanimously.

The Chairman promised to transmit the resolution, in his capacity as Chairman of the meeting.

A vote of thanks was passed to Mr. Bedding for his kindness in occupying the chair, and he, in returning thanks, said that he only hoped to see the successful flotation of the new Association.

"Please add my name to the list of those wishing to join the P.P.A., and will do everything in my power to help it."

M. BUCKLEY, 117, George-street, Limerick.

"Please add my name to the list of those willing to combat Messrs. Bubble and Smoke, and I trust we may have a successful campaign."

F. W. URQUHART, The New Studio, Dingwall.

"If the proposed professional association is formed, I shall be pleased to become a member."

ALFRED WM. HOLLIDAY, Station-road, Alton.

"Please enter my name as member of the proposed association. Shall be pleased to do anything I can in the matter."

J. JACKSON, 389, Stanley-road, Bankhall, Liverpool.

"I am sorry to say I was unable to attend the meeting, but shall have much pleasure in joining the proposed professional photographic association." FRED MARSH, 7, Caxton-terrace, Henley-on-Thames.

"Am canvassing the other professional photographers in and about the neighbourhood of Shrewsbury, and shall, no doubt, get a good number, if not all, to sign their willingness to join and support the above." WILLIAM H. GILBERT, 21, Wyle Cop, Shrewsbury.

"We have written all the photographers in this district, and have received favourable answers from the following, viz.:—Wm. Fergus, Greenock; A. and G. Taylor, Greenock; James Paton, Greenock; Norman Hunter, Port Glasgow; W. Robertson and Co., Gourock. Three others still to reply."

JOHN PRATT AND CO., Pictorial Photographers, Greenock.

"Permit me to express my entire sympathy with your excellent effort to consolidate the interests of photographers. I regret I canot accept the honour of being nominated for the committee of the proposed association, because of not having time to conscientiously fulfil the duties, but I shall gladly become a member of the body."

LYDDELL SAWYER, The Dudley Studios, 230, Regent-street, W.

"You can rely upon my full support, and I will help in any way you desire, both personally and by subscription. Over 20 years' experience in the business decides me that something as you propose is absolutely necessary, and I most devoutly hope that some substantial good will result." DOUGLAS PYM, Belle Vue Studio, Streatham.

"I beg to state that I am willing to become a member of the proposed photographic association, which, in my opinion, must be formed, and that without any further delay, and promise to give same my support. I am sorry I shall not be able to attend meeting on Thursday, but wish it every success."

CHARLES TREASURER, 21, Inglis-street, Inverness.

"Among the enormous number of letters from professional photographers, which have lately appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY in favour of forming a Professional Photographers' Association, I have been surprised," writes "Half-Tone" in the "Oxford Times," "to be unable to find a single communication from an Oxford photographer. Let us hope the reason is that the Oxford professionals are doing so well that they have no need of such an Association. Still I should have thought that whether doing ill or well all professionals would support a scheme of this character, which must benefit the professional in the long run."

The following circular has been issued to the photographers of Brighton:—"Through the agency of Mr. Bedding, an Association of Professional Photographers was formed on March 28, 1901. It is suggested to form several provincial societies, who will send their delegates to the Central Committee in London. I propose that the Brighton photographers form such a branch for Brighton and the South Coast, and shall be pleased if you will kindly support the undertaking by attending a general meeting at Chatfield's Hotel, West-street, Brighton (hotel entrance), on Tuesday next, April 2, at 8.30 p.m., to discuss the matter. If unable to attend kindly communicate if in sympathy.—OTTO PFENNINGER-SUISSE, 79 West-street, Brighton."

"Should you be successful in the formation of an Association for the protection of the photographic profession, I shall be glad if you will kindly add my name to the list. I think it the duty of every photographer to take the opportunity now offering to try and form the proposed Association, not only to try and protect themselves against such large firms as Tobacco and Soap, but against those in the profession who are doing much harm by 'cut-throat' prices, in cabinets, 5s. per dozen, &c., which neither allows themselves to live or to pay their assistants respectable salaries. The latter being the cause of so many inexperienced assistants, as they are disheartened, and so are prevented from interesting themselves in their work, and no doubt think it is not worth their while to spend time or money in studying the profession, and so are content to pose as first class operators and retouchers, knowing, or caring very little about either, and their practical knowledge of any of the other many interesting branches is nil. Wishing you every success in your work."

T. NEVILLE, Aintree Studio, Aintree, Liverpool.

HALATION AND DARK-ROOM ILLUMINATION

FROM the last number of the "Proceedings of the Oxford Camera Club," which we recently received, it appears these two perennially interesting subjects have occupied the attention of the members. They were separately dealt with at one meeting.

Mr. C. Rippon, in commencing his paper on "Halation," said that halation was one of the earliest difficulties of the beginner. When the latter sought advice from a photographic friend, he would simply be told that he should use backed plates. That advice was all very well as far as it went, but the friend would have done better to also say something about the proper exposure for interiors and the care that should be taken to avoid selecting a point of view which included the strongest light in the building shining directly into the camera. This suggested the two points to be discussed that evening: first, that a backed plate would not prevent all kinds of halation, when the word was taken in its usual sense as meaning a diffusion of light around the high lights; second, that except in extreme cases proper attention to point of view, exposure, and development, would prevent halation altogether without the plate being backed at all. There were four kinds of halation: first, that caused by reflection from the back of the plate, which was the only kind that could be stopped by backing the plate; second, that caused by lateral spread; third, that caused by the brilliant illumination of small particles of solid matter suspended in the air; fourth, that caused by taking a photograph with the chief and practically the only source of light directly in front of the lens, and with nothing at the sides or behind the camera to act as a reflector. In bad cases of halation in an interior, probably all these different kinds contributed to the result, and backing a plate would therefore only mitigate and not eradicate the evil. For instance, he had there a negative taken on a backed plate, but which was hopelessly spoilt by too strong a light shining into the camera from a window directly in front. How could all the different kinds of halation be combated supposing only unbacked plates could be used? The third and fourth might be taken together, for, if they overcame the fourth, they would also overcome the third, unless there was an unusually large amount of dust in the building. If the window passing the strongest light must be included, a dull day should be selected and a time when the sun is as far away as possible from that quarter towards which the window points, while sometimes the use of reflectors behind the camera was an advantage. Any way, a full exposure was an absolute necessity. The second kind, lateral spead, was due to under-exposure and over-development. Therefore, in the second, third, and fourth kinds of halation, full exposure and correct development played, as they did in all photography, the most important part. They were, if possible, still more important in the first kind of halation, when the plate was unbacked. The light reflected from the back of the plate influenced most strongly the bottom of the film next the glass, and was rarely strong enough to penetrate to the surface. Consequently, to avoid developing that part of the film, a full exposure should be given and a pyro developer used, for pyro caused the silver to be deposited in a much more non-actinic form than any other developing agent, and with it it was not necessary to develop through to the back of the plate. He had brought three negatives of the same subject exposed for the same time under exactly similar conditions. The first was exposed in a bright metal sheath, and was developed with ortol. Halation was to be seen in several places. The second was exposed in a similar sheath, but developed with pyro under the system of surface development. The halation was very slight indeed. The third was exposed in a sheath covered with orange blotting-paper gone over with dead black, and was developed with pyro. Halation was, to all intents and purposes, absent. All the three plates were entirely innocent of backing. The system of factorial development was probably of greater use in interior work than in anything else, for to develop an interior for the same gross time as an outdoor snap-shot would mean absolute failure. Backed plates were, of course, useful as far as they went, and where the worker was doubtful of the exposure or used the newer developers they were a necessity. There were also extreme cases where even full exposure and surface development would not suffice, for the simple reason that the scale of light gradations was too long, and it was in such cases that a multiple film plate was most useful, as it gave a far greater range than a single film. He was afraid, with the exception of the surface development, which had been a pet device of his for some years, there was nothing new or original about his paper, but he hoped it might raise some discussion and perhaps induce one or two other members of the Club to give a little more attention to the subject of halation.

Mr. G. W. Norton dealt with the subject of dark-room illumination in a comprehensive way, and said he would rather treat it from a practical point of view, and for what little light he could throw on such a dark subject he was largely indebted to the researches of Mr. Howard Farmer, who was the inventor of the lamp he was about to show them. Proof that more light was wanted in the dark room was given in the increasing number of gas-light papers put on the market. The word "dark room" was no misnomer, for it was usually lit with a dim and evil-smelling paraffin lamp, which only just made darkness visible, and the bad light caused innumerable accidents. It also a moot point whether long working in such a ruby light was not bad for the eyes; the constant change from dim ruby to bright light was certainly most detrimental. There was no doubt that more light might with safety be used in dark rooms than was generally employed, the reason for the very dim light being that the worker, especially if a beginner, might be able to keep looking at the negative held close up to the lamp. It would be much better to employ a stronger light and keep the plate covered during the greater part of development. That, indeed, was the safest plan any way, as all plates were sensitive to red and yellow light in some degree. Most ruby glass passed a great deal of ultra-violet, to which a plate was very sensitive, and consequently, to make matters really safe with a coloured glass, the light had to be reduced to a minimum. The desire to get a beter light for the dark room led Mr. Farmer to try filtering the light through various chemical solutions; after trying many things, he found that a six per cent. solution of potassium bichromate was the most convenient and effective. That gave a good orange light, 250 times safer than the same colour passed through glass, while with the addition of a little eosine a ruby light can be got 1200 times safer than the same shade passed by ruby glass. The reason was that these solutions, unlike glass, absorb all the ultra-violet rays, whereas orange glass, that transmits fifty per cent. of the yellow rays, will also pass ten per cent. of the blue, green, and other rays, to which plates are highly sensitive. As regarded the sensitiveness of plates to red and violet, experiments showed that different makes and even brands of plates greatly varied, consequently a light that was quite safe for one brand would not be so for another. For instance, an Ilford red label would stand sixteen

imes as much as an Imperial flashlight and thirty-two times as much s a Cadett lightning. It was well when using the bichromate lamp o shade the plate as much as possible from the direct light of the amp. The strength of the solutions were: For ordinary plates, six er cent. solution of bichromate of potassium; for spectrum plates, dd one grain of eosine to each ounce of solution.

Mr. Norton's lantern was fitted with incandescent gas and gave a eally brilliant illumination, quite sufficient for reading a book with ase, yet he developed on the spot an ordinary and a spectrum plate ithout any trace of fog.

AUJAT'S MACHINE FOR THE PRODUCTION OF GELATINE RELIEFS.

[Patent No. 16 8 3 of 1900.]

HE reliefs intended for the production of the pictures, and which are n the glass plate *a*, fig 3, are fastened by means of wet blotting-aper to somewhat broader and absolutely smooth metal or glass ates, *b*. These plates rest on the adjusting-screws, *c*, which are tached, at certain distances apart, to a metal plate, *d*. As the re-efs are not all of the same height, and consequently would print regularly, the position of the plates *a* and *b* is regulated by the ljusting-screws *c*, so that the highest points in relief are at the me height as the upper edge of two flat metal bars *e* fastened on each the two parallel sides of the metal plate *d*. This adjust-g operation having been done, the plates, *b*, are then firmly screwed the metal plate, *d*, by means of the screw, *f*. When all the reliefs e brought to the same height, and the plates, *a* and *b*, made fast

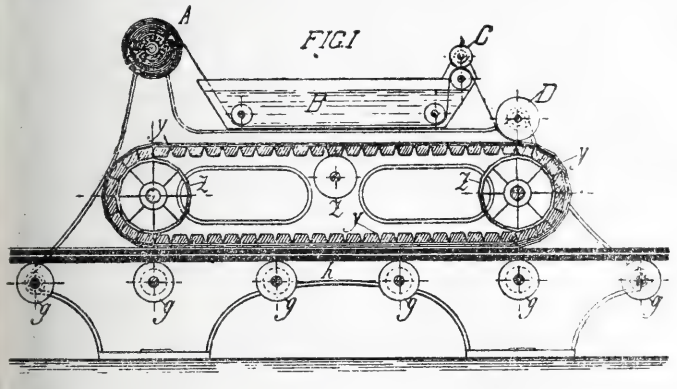


FIG. I.

the plate, *d*, the latter is carried over the cylinders, *g*, mounted i the frame, *h*, fig. 1, 2, and 3.

n order that the new printing process may compete with other nting processes, such, for instance, as photographic printing, it is ssary that the moulds should be printed in quick succession and hout interruption. As, however, the gelatine always requires a tain time for congealing, allowing to take it off from the mould, hout damaging the copy, the residue remaining in the recesses of moulds, after removal of the excess, must be kept in the same ition until it has congealed. For this purpose a counter-pressure te is necessary, which is not affected by damp or heat, does not

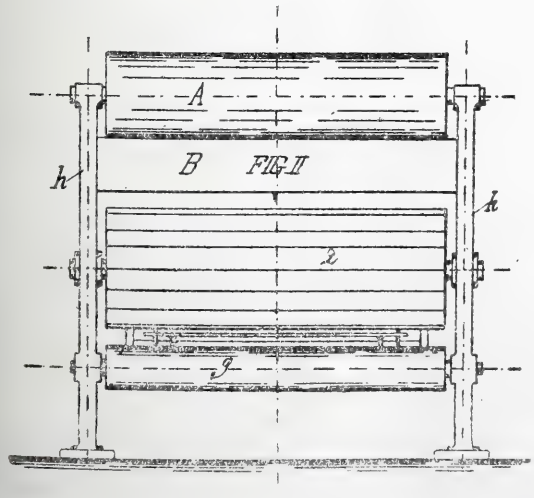


FIG. II.

bet or shrink, and must lie on the printing forms quite flat, both lei hwise and transversely. The liquid gelatine repelled by the oil of he moulds is very mobile; it is thus further necessary that the counter-pressure plate, after it comes into intimate contact with the gelatine ink, should have a certain weight, in order to keep it stationary.

To obtain such a plate, a number of metal plates, smoothly polished on both sides, are fastened together, parallel one to the other, on a strip of silk cloth saturated with celluloid, so that the whole forms an absolutely smooth flexible in the longitudinal direction, and uniformly thick layer. The said flexibility is ensured by the tapering off of the side of the plates. The assembling of the plates, *y*, can be effected in different ways, for example, by means of two flexible steel bands screwed in the longitudinal direction upon the edges of the plates. The two ends of this flexible plate being joined so as to form a kind of endless band, the latter is put upon the rollers, *z*. This mechanism brings the paper to be printed into close contact with the gelatine ink. Falling of its own weight, following the rotating movement of the rollers, the counter-pressure plate presses at the same time the surplus gelatine ink from the moulds, and retains the residue firmly in an equal manner, until the same is congealed. No sagging of the pressing apparatus, *y*, towards the centre of its width is possible, owing to the metal plates not being flexible in their breadth. Travelling on the bars, *e* fig. 3, the plates remain constantly at the same height, also when there are large hollow spaces in the reliefs. The pushed-away gelatine ink

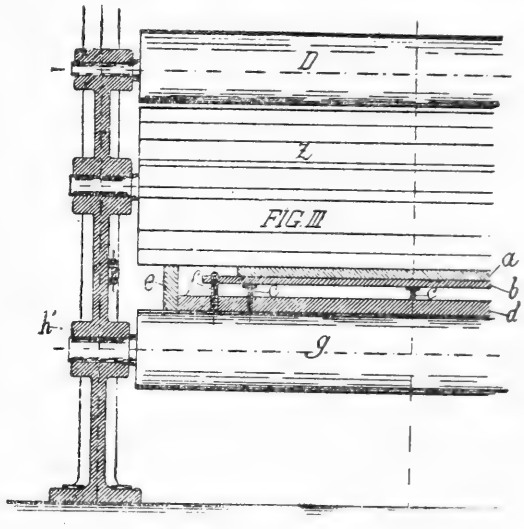


FIG. III.

flows on to the plate, *b*, is removed from time to time, and serves once more.

As the paper, &c., to be printed, if laid loosely on the liquid gelatine, would form creases, it is conveyed by the roller, A, through the vessel, B, filled with water, and, after the excess of the latter is removed by the cylinder, C, is pressed by the cylinder, D, against the pressure plate, *y*. Upon the further movement of the plate, *y*, the paper, in consequence of such movement, remains on the moulds until it is released therefrom upon the upward movement. As soon as the gelatine ink is completely congealed, the paper with gelatine ink, which has adhered to it, and represents the picture in light relief, is removed by means of a mechanical contrivance, or by hand, and hung up to dry.

For the small-size pictures, in lieu of the flexible and rotating counter-pressure plate, a proportional and absolutely smooth metal plate may be made use of. It is fastened at an equal distance above the rollers, *g*, and, pressing upon the gelatine, it pushes off the surplus. At the same time the paper is brought in close contact with the gelatine, and retained by the metal plate in the same position on the rollers until the gelatine is congealed.

EXHIBITION AT THE G.E.R. MECHANICS' INSTITUTE, STRATFORD.

THE photographic section of the Great Eastern Railway Mechanics' Institute plays a very useful part in connexion with the educational and recreational institution to which it is attached. Though its headquarters are situated in a locality which one can hardly describe as picturesque, the members, as railway servants, have a facility in going afield at an inconsiderable expense which most of us would like to share with them. We believe they can travel almost anywhere at the rate of about one-eighth of a penny a mile. That some of them have availed themselves of their privilege the Exhibition under review bore evidence, for beauty-spots in many even distant parts of our country were portrayed, though, naturally, those of the Eastern Counties were predominant.

We noted with satisfaction that the class for Engineering and Mechanical subjects was better filled in this year's exhibition than in that of last year. In these subjects the members of this Institution should show pre-eminent skill. Many of them, presumably, have a

knowledge of engineering, and they have almost unlimited facilities for practising. We regret we cannot say that they have risen to the occasion. As far as choice of subject was concerned, there was little or no cause for complaint; many of the photographs were extremely interesting to any one interested in mechanics; but too often there was an absence of that perfection in technical photography which is essential in a photograph which should be more minutely accurate than a scale drawing. We noticed instances of converging perpendicular lines—that is an inexcusable fault—and generally there was an absence of detail in the shadows, owing to under-exposure and the employment of an unsuitable printing process, which greatly lessened the value of the photographs as illustrations of machinery. The judge of this class was Mr. J. Holden.

In most of the pictorial classes a satisfactory advance was shown, though we think the judges, Messrs. Harold Baker and H. Snowden Ward, were a little over-lenient in some of the classes in awarding all the medals offered. The class for Portraiture Groups, Animal and Flower Studies, however, showed a distinct retrogression. Seascapes and river scenery were, for some reason not accounted for, dissociated from landscapes, and classed with instantaneous work, a novel but not desirable method of classification. In the Members' Classes we noted commendable work by W. B. Ward, C. W. Harris, T. R. Bourne, A. Woolford, T. A. Smith, J. K. Ayling, E. E. Morgan, and H. D. Banks.

The Open Classes contained a very fair selection of good work, the most notable being by F. J. Mortimer, S. C. Stean, E. R. Collins, J. E. Hunt, Graystone Bird, F. W. Bannister, Miss E. A. J. Wright, J. G. T. Walford, C. W. Walker, H. W. Bennett, and J. K. Ayling. The trade was represented by H. Mitchell, of Forest Gate, who made a good show of apparatus, &c.

The exhibition was held on the 26th and 27th March.

THE AWARDS.—MEMBERS' CLASSES.

Class A.—Landscape.—Silver medal, H. B. Ward; bronze, H. D. Banks.

Class B.—Architecture.—Silver medal, C. W. Harris; bronze, J. K. Ayling; consolation prize, E. James.

Class C.—Seascape, &c., and Instantaneous.—Silver medal, T. A. Smith; bronze, T. R. Bourne.

Class D.—Portraiture, &c.—Silver medal, J. K. Ayling; bronze, A. Woolford.

Class E.—Engineering Subjects.—Silver medal, C. A. Edwards; bronze, H. D. Banks.

Class F.—Lantern Slides.—Silver medal, C. S. Scott; bronze, C. Harding.

OPEN CLASSES.

Class G.—Any Subject.—Silver medal, Graystone Bird; bronze medals, F. W. Bannister and H. W. Bennett.

Class H.—Lantern Slides.—Silver medals, F. Page and F. W Gregg; bronze medals, H. W. Bennett and W. E. Lane.

News and Notes.

ERRATUM.—The heading to Messrs. Johnson's letter in our last issue should read "Dark Chloride of Gold," not "Dark Chloride of Silver," as printed.

LIZAR'S Photographic Catalogue.—Mr. Lizars begs to tender his thanks to the very large number of applicants for his photographic catalogue and reference book. Owing to the great demand it is impossible to answer each one individually, but Mr. Lizars hopes to be able to post the lists in the course of a week or ten days' time.

THE Röntgen Society's next ordinary general meeting will be held on Thursday, April 18, 1901, at 20, Hanover-square. The chair will be taken at eight p.m. Dr. Dawson Turner will show a new form of mechanical Interrupter. Mr. Russell Reynolds will show a new form of Tube. This will be the "Discussion" meeting of the session. Subject: "X-ray Therapeutics." Miss M. M. Sharpe, L.R.C.P., will open the discussion.

THE first General Meeting of the Photographic Trade Association will be held at Anderton's Hotel, Fleet-street, London, E.C., on Thursday evening next, April 11, at 7 o'clock prompt. Mr. George Houghton in the chair. The meeting will be open to wholesale and retail dealers, manufacturers, and responsible managers of such firms as are employed in the photographic trade, as well as to members of the Association, on presentation of business card.

ROYAL Photographic Society.—The exhibition of photographs by Col. Gale, now on view at 66, Russell-square, will remain open until Saturday, April 20, from 10 a.m. to 4 p.m. (Wednesdays 10 to 8), and may be seen on presentation of visiting card. On Wednesday, April 24, at 8 p.m., an exhibition of photographs, by Monsieur Robert Demachy, of Paris, will be opened to the public. The Ordinary Meeting on April 9, will not take place as announced, but will be held on Tuesday, April 16.

THE West Surrey Photographic Society's Thirteenth Annual Exhibition of photographs, lantern slides, natural colour photography, X-ray, wireless telegraphy, and animated photographs, will be held in the Lecture Hall, at the Railway Hotel, 110, Battersea-rise, S.W., on Wednesday, Thursday, Friday, and Saturday, April 10, 11, 12, and 13, 1901, from six to eleven each evening. Admission will be free by ticket or visiting card, and tickets can be had from the photographic dealers in the neighbourhood, from any member of the Society, or from the Hon Secretary, Mr. W. H. Wilshere, 236, Lavender-hill, Clapham Junction, S. W.

MR. W. E. Plummer, F.R.A.S., lectured before the Liverpool Amateur Photographic Society at their last weekly meeting; his subject being "Some Applications of Photography to Scientific Inquiries." The lecturer first dealt with instantaneous photography from its scientific aspect, and illustrated his remarks by photographs of jets of gas passing through water, shots dropping into various liquids, and of the fracture of a soap bubble. He next touched upon photography as a means of obtaining permanent and continuous records, and showed photographic records of seismographic disturbances. Photo-micrography and photography of the invisible was also referred to, and several striking photographs of sound-waves were shown. The lecture was of vital interest and greatly enjoyed.

AT Anderton's Hotel, Fleet-street, on April 1, Messrs. Newton and Co., gave a dinner to their employees, in honour of Mr. Edward Newton, who is retiring after fifty years' service. Mr. H. Newton took the chair, and in proposing the toast of Mr. E. Newton, said that sorry as they were to part with a man who was at his post before any of them had started at business at all, they could but hope that he would be spared to enjoy a long and well-earned retirement. Mr. Freshwater then presented a handsome clock, on behalf of the employees, together with an address illuminated by one of the staff. The manager of the factory said that though he had known Mr. E. Newton for forty years, that was the first time he had seen him sit down, and thought he deserved a rest, and hoped he would live long and have health to enjoy it. The chairman then said that he had some news for most, if not all, there, for Mr. Freshwater had been offered a partnership, and he was pleased to say had accepted it. He, therefore, gave them the toast of the "New Partner," which was enthusiastically received. Mr. Freshwater, in replying, said that though his position was altered, he hoped that the friendly relations with his old colleagues of so many years would remain unchanged. The evening finished with songs and music by various members of the staff. One noticeable feature was the large number of men who had been with the firm from boyhood.

THE Croydon Camera Club's Eleventh Annual Dinner was held on Saturday, at the Greyhound Hotel, Croydon, with every sign of success. The company was large, the fare dainty, the speeches were merry and the music not too plaintive. The President was, perhaps, hardly serious enough, for such an occasion, while the Hon. Secretary, Mr. E. A. Salt, for ever destroyed his chances of luring members to have a quiet flutter with the cards, by the extraordinary manner in which he made them change colour and place. Sir Frederick Edridge proposed success to the Club in eloquent and flattering terms. Professor Whitaker, F.G.S., responded to the toast of kindred societies, on behalf of no less than twenty-five different societies, of which he is a member. He claimed that all science is now so intimately bound up with photography, that he regarded every scientific society to which he belonged as kindred. The chief incident of the evening was the presentation by the President, on behalf of the Club, of a handsomely illuminated testimonial of the subscribers' regard and gratitude to the late Hon. Secretary, Mr. W. H. Rogers. A very large proportion of the members had, at their own desire, associated themselves with the above, which, besides the illumination, was supplemented by some splendid examples of engraving issued by an eminent firm in Threadneedle-street. They were valued at quite £5 each. Besides other less known visitors, we noticed amongst the company Messrs. Howard Farmer, Jesse W. Ward, and J. McClerg. During the evening Mr. Rogers announced that the accounts of the last exhibition showed a nett profit of over £5.

Commercial & Legal Intelligence

THE Photo Trade Association of Ireland.—At an informal meeting of some of the photographic trade of Dublin, on Wednesday, the 13th ult., it was unanimously decided desirable to form a trade association, with the consequence that a meeting was held in Jury's Hotel, Dublin, on Wednesday the 20th ult., when a number of the influential members of the trade were present. Mr. P. C. Curtis having read the notice convening the meeting, it was proposed by him that a photographic trade association of Ireland be formed, and that the name of such association be "The Photo Trade Association of Ireland." Seconded by Mr. J. B. Laffan, and carried. Mr. V. H. Smyth proposed, seconded by Mr. J. B. Laffan, and passed unanimously, that Mr T. Mayne be elected chairman, and that such election do hold good for twelve months. Proposed by Mr. T. H. Mason, seconded by Mr. T. Cahill, and passed unanimously, that Mr. P. C. Curtis be elected Hon. Secretary. It was then proposed by the Chairman to elect an Hon. Treasurer, when Mr. V. H. Smyth was proposed by Mr. T. Mayne, seconded by Mr. P. C. Curtis and unanimously elected. After considerable discussion it was unan

usly decided that the committee number ten, three to be elected m Dublin, with the Chairman and Hon. Secretary, and five from er towns in Ireland. Three to form a quorum. It was considered irable to elect the Dublin representatives to facilitate matters when following gentlemen were chosen:—Mr. J. B. Laffan, Mr. V. E. yth, Mr. T. H. Mason. It was resolved that the Hon. Secretary requested to invite the dealers of Ireland to join. The question of scription having been discussed, it was decided that the annual scription be half a guinea, with power to call up to one guinea if nd necessary. The question of rules was left over till next meeting, order to give the members time to consider same. The Chairman thought it was desirable to discuss matters of interest to the trade, thought that perhaps one of the first matters to be discussed was prohibitive conditions lately laid down by the Kodak Company. re was a long discussion on this matter, after which it was proposed Mr. P. C. Curtis, seconded by Mr. J. B. Laffan, and passed unanisly, "That we, the members of the Photo Trade Association of Ired here present agree to await the decision of the dealers of at Britain and Ireland, and in the meantime undertake not to sign Kodak agreement, and only to accept goods under protest." The t matter brought forward was the cutting of prices on plates and ers, when it was decided that the Hon. Secretary be instructed to te to the plate and paper manufacturers association, with a view topping such trading.

Patent News.

following applications for Patents were made between March 18 and ch 23, 1901:—

TERNS.—No. 5605 "Improvements in Automatically Feeding Magic Lanterns." (Communicated by Arold Valentin Cristiani-Mayall, France.) OSCAR SCHÖLZIG.

AZINE CAMERA.—No. 5614. "An Improved Magazine Camera, with Detachable Plate-changing Box." ERNEST SAMUEL JORDAN.

M HOLDER.—No. 5870. "Improved Adjustable Film Holder for Developing." CECIL HOWARD BARRETT.

NTING PROCESS.—No. 5879. "Improved Process for Obtaining Photographic Prints." (Communicated by Actien-Gesellschaft für Anilin-Fabrikation, Germany.) CHARLES DENTON ABEL.

TTERS.—No. 6024. "Means for Automatically Operating Camera Shutters at a Predetermined Time." WILLIAM DAWSON HOPPER.

SES.—No. 6080. "Improvements in Lenses." A. HEINRICH RIETZSCHEL.

DUCING PHOTOGRAPHS.—No. 6106. "Improvements in Photographs and the Mode of producing same." GEORGE DAVISON REID and FREDERICK JAMES ROULSTON MACFADYEN.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

ril.	Name of Society.	Subject.
.....	Borough Polytechnic	Excursion: Salisbury Cathedral. Leader, F. W. Gregg.
.....	Glasgow and West of Scotland	Annual Lecturette Competition.
.....	Manchester Amateur	Printing Processes.
.....	Newcastle-on-Tyne	*X-ray Photography*. T. M. Clague.
.....	Redhill and District	Photographic Technique.
.....	Darwen	Print Competition Evening for Club Album.
.....	Oldham	Exhibition of Members' Transparencies.
.....	Woolwich Photo. Society	Open Lantern Evening: Holiday Trips by Members.
.....	Croydon Microscopical	Rejlander's Work.
.....	West London	*Making Lantern Slides*. M. W. Cockerell.

ROYAL PHOTOGRAPHIC SOCIETY.

NICAL Meeting, March 26,—Mr. Chapman Jones, F.I.C., F.C.S., e chair.

. J. H. Agar Baugh read a paper upon

SOME IMPROVEMENTS IN OPTICAL PROJECTION.

said that during the last few years he had been conducting a s of experiments in regard to lantern construction, and the rela- of parts in such a construction. Rigidity, in the first place, was a essential feature, and this he assured by the adoption of a single oard for the lantern, extending its full length. This was strengthat both ends. The body, he maintained, should be of metal in to withstand the great heat of the illuminant, especially if this e electric arc. Mahogany was of little use, although protected by tos lining, as is often the case. A Russian iron body cooled very quickly indeed. For limelight he thought the lantern he n view was very well suited. It was also very well adapted for lectric arc light. As regards the common method of placing the nser inside the lantern, he thought a preferable course was to t it one half outside, and advocated greater attention to its ven- n by means of air holes in the mount. As regards the slide carhe believed that it was generally admitted that an interval of dark en each slide, or the throwing of the slide out of focus before val, irritated the sight and distressed the eyes. He therefore ated only a comparatively narrow strip of dark between each as shown, in order to separate two given views, and spoke against ractice of running slides through, one touching another, with the able strip of bright light between. He had also taken steps to pre- he "wobble" of slides in the carrier, which, of course, had to be enough to admit the thickest slides, and had fully answered its purpose, although springs had not, he believed, been very successfully applied in the past. His own carrier firmly held the slide whilst it was in position in front of the condenser, loosing it afterwards. The carrier also rotated in its position, and could thus be centred once and for all at every display. The picture could be levelled by merely turning a screw. The slide itself was not so liable to become heated because there was an ample current of air on both its sides, and it was not nearer than a quarter of an inch to the condenser. The carrier was fitted with a rack and pinion in order to vary the distance of the slide to or from the condenser. By this means alterations of focus caused by the different thicknesses of slides could readily be compensated. The lens support slid along the baseboard and could be clamped as desired. He preferred such an arrangement to one of an extending baseboard or telescopic tubes. With reference to the optical system, he advanced the statement that no entirely satisfactory condenser was made. He had a good word for Voigtländer's condenser, which was well corrected, and with which he said a lens gave better definition than it would with an ordinary condenser. The glass was specially annealed, and there was practically no liability to crack even in a draughty room when heated. The diameter of a condenser he thought should be four and a quarter inches, as this gave more play between the slide and the condenser. Smaller diameters required the slide to be placed very close to the condenser, which was undesirable. He had several projection lenses to show and test. He thought the most pleasing results were got when using an *f*-4 symmetrical, if the focus be eight inches; for nine inches *f*-4½; for twelve inches *f*-6 euryscope; for longer foci *f*-8 R.R. lens. In practice he thought it possible to dispense altogether with the bellows, leaving the distance between the slide and the projecting lens absolutely open. He had proved that it could be done in quite small rooms, and it was still easier in large halls, where the amount of light that strayed was insignificant. As regards the use of limelight or electric arc light, he thought one should be guided by the nature of the slide. Slides made for the limelight appeared inferior when shown by the arc light. Perhaps the interposition of a suitable yellow tint into the arc light would compensate the matter. At any rate, the electric arc light was of not much use where only alternating current was available. Mr. Agar Baugh then proceeded to compare the Society's electric arc lantern (direct or continuous current) with a Dallmeyer optical system with his own lantern, using limelight, and a battery of lenses working at *f*-3.6, *f*-4, *f*-4.5, *f*-6, and *f*-8. Slides by Mr. Marriage were used as test subjects, and Mr. Baugh ultimately declared himself in favour of the *f*-4 lens, which gave better definition, a flatter field, and an absence of reflections, compared with the other lenses used by Mr. Baugh. The Society's lantern was generally thought to give a brighter disc, and there was little room for improvement as regards definition and flatness of field.

Mr. Marriage considered that the diameter of the condenser should be four and a half, or even five inches, to properly cover a lantern slide at the corners. He had come to the conclusion that an *f*-4 lens was best for projection. An *f*-3 lens did not give as flat a field and as good definition as the *f*-4, which, in its turn, was not so good as the *f*-5.4 anastigmat. But the increased light given by the *f*-4, compared with the *f*-5.4 seemed to be well worth the slight loss of definition.

The Hon. Secretary (Mr. John A. Hodges) did not look with favour on the adoption of the open front in the lantern. He had to confess, however, with regard to the optical systems that the Society's own lantern bore the palm. The comparative merits of the electric arc light and the limelight had been for long a very moot point. He was of opinion, however, that with a good "average" slide the electric arc had points of advantage. Warm-toned slides were rendered better with the electric light, because the purity of the colours was preserved. He was pleased to congratulate the lecturer on the general construction of his lantern, its adaptability to the use of lenses of greatly varying focal lengths, and the commendable rigidity of the whole.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 28,—Mr. P. Everitt in the chair.

Mr. Haddon showed a greasy pencil that would write on glass and suggested the use of it for writing titles on bottles; the composition was unknown, but the pencils were procurable from Baird and Tatlock.

Mr. Everitt showed a new folding Frena fitted with a Beck-Steinheil lens, which was universally approved of by the members present. Mr. Welford showed some frame negatives and ferro-prussiate prints made from same.

Mr. E. Human gave a paper on a new developer, "Synthol." Messrs. Everitt, Rapson, and Haddon, all joined in a discussion on the number of times a developer could be used without showing signs of deterioration, and it was the unanimous opinion of the meeting that the soluble bromide gradually acquired by the developer would be bound to act unfavourably on the finished results, especially with paper. A general discussion on developers then ensued, joined in by Mr. Drage, Mr. Hodd, Mr. Welford, and the Chairman, and it was generally conceded that whilst pyro was still the standard developer, it was ably seconded by certain of the newer developers, especially metol and rodinal. Mr. Welford expressed regret that ortol had not caught on as, in his opinion, it should have done. Mr. Rapson stated that he was now using it with every satisfaction, but when at all oxidised it somewhat slowed.

PHOTOGRAPHIC CLUB.

MARCH 27,—Mr. Hans Müller in the chair.

Mr. E. A. Newell asked a question regarding the use of ordinary bromide paper for negative work.

Mr. E. W. Foxlee said that the rapid paper would not be so slow as to present difficulties to its use instead of plates in point of speed of exposure.

Mr. Hutton P. Smith said that one would not get very satisfactory silver prints from such negatives.

Mr. Foxlee added that the grain of the paper would show, and waxing of the negative would not get rid of it although it would quicken the printing process. In the waxed paper days one had a thin paper, the grain of which could be very nearly got rid of by waxing, but the thick bromide papers of to-day were not so amenable to this process.

Mr. Wynne believed that Canada balsam in benzole was used to get rid of or reduce the grain of a paper.

Mr. Foxlee said that somebody had recommended castor oil, and another substance used for the same purpose was vaseline. He thought that the presence in the paper of either substance was not a desirable one, however, on account of their nature.

Mr. Smith foresaw also a difficulty in securing good contact between the big paper negative and the printing paper, at least, it was not easy.

Mr. Foxlee thought not if one used a frame with a plate glass front and a well-padded back. He knew that big prints by the blue process were made, and that they were sharp enough all over. As regards development he had used pyro as well as hydroquinone, and had easily got any amount of density, and a plucky and bright negative on bromide paper.

Newcastle Photographic Association There is now on view at the Grand Assembly Rooms, Barras Bridge, a collection of photographs by Mr. William Crooke, Edinburgh, who has brought the art of portraiture to a state of perfection unapproached by others. Mr. Crooke, whose work is known throughout the kingdom and further, visited the city as the guest of the Newcastle and Northern Counties Photographic Association at their dinner last week, and was prevailed upon to bring with him a selection of representative portraits from his gallery, as well as a few others secured on loan from his patrons, and it was at the request of the committee of the local society that he arranged to have the collection on exhibition to the public. A photographer since the early sixties, Mr. Crooke has had a very extensive experience in the art and science, the many stages of modern advancement in processes all having come under his practical acquaintance. It was some years ago that he realised the need for thoroughly refined and unconventional portraiture, and not only being a skilled operator, but of an artistic turn of mind, he has earned fame by his original large-sized direct portraits in carbon and sepia platinum, the latter being perhaps the more favoured medium. A result of his long practice and study has been to turn out pictures that possess, particularly in respect to lighting and pose, pronounced artistic value, and are at the same time worthy and appropriate of finding place beside the engravings and mezzotints to be found in many of the family collections of the Scottish nobility and gentry. Mr. Crooke's studio in Princes-street, Edinburgh, is in the highest favour, and a few of the portraits on view at the Grand Assembly Rooms testify not only to the uniform excellence of his work, but also to the fact that by Scottish society he is especially honoured. A fine portrait in sepia carbon is that of Sir James Miller, of Manderson, a most effective presentment of this popular soldier and sportsman. As a khaki picture this could scarcely be exceeded for taste and character. The venerable face of the genial Dr. Cooper, editor of the "Scotsman," is shown in dark sepia platinum, as is also that of Mr. James Law, a proprietor of the "Scotsman." Mr. David Bispham, in character in "Les Huguenots," is a very happy effort; and the study of a girl's head in the dress of an Italian peasant is remarkable for its intensity and earnestness. Lord Napier and Ettrick is also treated in sepia platinum with capital result, and the portrait of the infant son of Lord and Lady Tankerville has much merit. An excellent portrait of M. Paderewski commands admiration. Mr. Crooke found the renowned pianist a perfect subject for portraiture, as beyond his striking personality, as shown in the cultured features, eloquent eye, and classic head, Paderewski was quite at ease in the studio. Indeed, he may almost be said to have been technically too good a subject, so thorough was his control over nerves and features. Recalling the portrait, a sepia platinum print, amateurs will envy Mr. Crooke his good fortune in having such a splendid subject, and will congratulate him on the entirely successful portrait produced. Very striking is the carbon print of "The Crusader," a Scottish gentle man who sat in the war dress of the old Border Crusaders. Other portraits of note are those of Lady Mary Lygon, Lady-in-Waiting to Her Royal Highness the Duchess of Cornwall and York, and now making the voyage to the colonies; Mrs. Patrick Campbell. Sheriff Comrie Thomson, and the judges of the Court of Session, Edinburgh. One and all of the portraits are worthy of a careful inspection, the technique and the art in all being of the highest class. With a view to making the most of its educational value, the exhibition will be open free to all.

Correspondence.

* *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK VERSUS GAMAGE.

To the EDITORS.

GENTLEMEN,—We have much pleasure in enclosing you herewith a copy of an Order of Court perpetually restraining Messrs. A. W. Gamage, Ltd., from committing breaches of our conditions of sale.

We think this matter will be of great interest to many of your readers. The cutting of prices persistently carried on by Messrs. A. W. Gamage for some time has caused much inconvenience to the other photographic dealers, and we have followed up the matter closely for many months, with the result set out in the Order of Court now obtained.

Messrs. A. W. Gamage have, by our action, been brought into line, and we now know of no cases of underselling going on in any quarter whatever. You will no doubt recognise the importance to our dealers, as well as to ourselves, of upholding our conditions of sale, and we should be obliged if, in publishing the terms of the Order of Court, as enclosed, you would draw attention to the successful issue to which this important matter has been brought.—We are, yours, &c.,

KODAK, LIMITED.

43, Clerkenwell-road, London, E.C., March 29, 1901.

In the High Court of Justice, 1900 K. No. 1095
King's Bench Division.
The Hon. Mr. Justice Day—Judge in Chambers.

Between KODAK, LIMITED (Plaintiffs) and A. W. GAMAGE, LIMITED, and F. WADE (Defendants).

Upon hearing the Solicitors for the Plaintiffs and for the Defendants, and upon reading the statement of claim delivered on the 8th day of February, 1901, it is ordered that A. W. Gamage, Limited, and F. Wade, the Defendants, and each of them and their and his servants and agents be perpetually restrained from selling or offering for sale or otherwise dealing with goods obtained from the Plaintiffs (Kodak, Limited) in breach of the conditions upon which the same were obtained from the Plaintiffs, and that the Defendants (A. W. Gamage, Limited) be perpetually restrained from inducing or seeking to induce purchasers of the goods of the Plaintiffs to sell or otherwise dispose of such goods in breach of the conditions upon which the same were sold by the Plaintiffs to such purchasers. And that the Defendants do pay the Plaintiffs' costs of this action, and that all further proceedings in this action be stayed.

Dated the 27th day of March, 1901.

KODAK, LIMITED.

To the EDITORS.

GENTLEMEN,—At the meeting, last Wednesday, of this Society, a resolution was unanimously adopted strongly condemning the action of Kodak, Ltd., in attempting to enforce their new condition on photographic dealers with regard to their rollable films, &c. No dealers were present.—I am, yours, &c., W. H. WILSHERE, Hon. Sec.

West Surrey Photographic Society, Clapham Junction,
236, Lavender-hill, S.W., March 28, 1901.

PLAY UP, YORKSHIRE.

To the EDITORS.

GENTLEMEN,—I know the demand on your space just now must be great, still I trust you can find a corner for a Yorkshireman in London to appeal to all professional photographers throughout Yorkshire to send their names (if they have not already sent them to you) to the Chairman of the Committee pro tem. of the Professional Photographers' Association, care of the Editor, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, Wellington-street, Strand, London, at once.

Altogether, Yorkshiremen, please—high, low, great or small, you really must play up in this great movement.

I attended the meeting last Thursday, and my opinion is that London is in earnest. I make this appeal to you all now, as Yorkshiremen do not care to follow far behind, so play up Yorkshire.—I am, yours, &c.,

WALKER.

London, April 1, 1901.

PHOTOGRAPHY AND THE FOURTH COMMANDMENT.

To the EDITORS.

GENTLEMEN,—I have noticed in the department of your paper set apart for advertisements concerning employment, &c., that there are an increasing number of employers requiring assistants to work on Sunday. This is altogether wrong. In the first place, it is illegal to conduct business on Sunday, though, sad to relate, the law has been lax on this point. However, as it was made for the good of the country, and, I think, assistants in particular, it is time that this statute was enforced.

The most serious aspect of Sunday business, however, is not that of law, but of health and morals to the mass and religion to the few. The Fourth Commandment of Almighty God our Creator is, "Six days shalt thou labour and do all thy work, but the seventh day is the Sabbath of the Lord thy God: in it thou shall not do any work," and so on, including all who come under our roof (employees, &c.). Many men and women are accepting seven-days-a-week appointments to escape being left among the "great unemployed;" but more shame to the avaricious employers, and to the indifferent Government for not enforcing good laws. It is a recognised fact that seven days' work a week is injurious to mind, body, and soul, and God provided for this.

t is impossible to serve God and Mammon, and Mammon is sin in nany forms, seven days' work a week being one, and "the wages f Sin is death." Looked at religiously, there is no excuse for the sin f breaking the Fourth Commandment, and the continuance will have ut one end to employer and employed. Looked at in common sense, mployers ought to desist for their health's sake; but if they will ot, then let us form an association to protect the somewhat defence-ess employees.—I am, yours, &c., SIX DAYS A WEEK.

March 30, 1901.

THE SALE OF POISONS.

To the EDITORS.

GENTLEMEN,—Kindly allow me to take exception to the tone and natter of the editorials in your paper of last week, I mean the ones ealing with the Pharmaceutical Society and the sale of poisons.

1. You seem to object to the Pharmaceutical Society prosecuting unqualified sellers of poisons; this is simply their duty, and they are ompelled to do it.

2. You recommend photographic dealers and users to support a Traders in Poisonous Compounds Protection Society." You might ive a little more information about this Society, but, as I think ine-tenths of the photographic dealers are chemists, I don't think it s much use asking them to support a Society like this.

3. You say photographic dealers, oilmen, and others are quite as apable of selling poisons as the pharmaceutical chemist. I will allow his as regards the nine-tenths of dealers who are chemists, but not s regards the other tenth and the oilmen, and if you will look up tatistics you will see you have no right to make a statement of this ind. The restrictions on the sale of poisons were made for the safety f the public, and, since the sale of poisons was confined to chemists, tatistics prove that the public has benefited.

4. You make a statement that you can buy cheaper from (I take it) Messrs. Lafayette, Laffan, and Smyth than you can from chemists. his I deny; also you insinuate in the same paragraph that chemists' naterials are inferior. I think this is a gross insult to an honourable ody of men for which you ought to apologise. Then you go entirely ut of your way to mention carbolic acid and fly-papers to condemn hemists' prices. Again, I contend that there is no body of traders ho work with and handle dangerous goods for less profit than the hemist and druggist, and I will undertake to buy better goods and or less prices from the chemist than you can from the dealer and oilman. Then you speak about the purity of chemists' materials. You ill find, if you look the matter up, that there are less prosecutions gainst chemists than there are against any other body of traders; lso it is not the duty of the Pharmaceutical Society to institute roceedings under the Sale of Food and Drugs Act. Personally, I ish it was.

But, Sir, how is it you do not recommend your readers to buy their hotographs from Messrs. Ogdens and Lever? Their photos are only alf-a-crown a dozen. If they go to the firms you mention they will ave to pay a lot more. Be consistent; unless you can perhaps see hat in many instances a little higher price means that a man is utting more of his brains and skill in what he deals in, whether it is hotos or chemicals. I cannot understand the great animus shown gainst chemists by you, especially if you will remember that it is ainly owing to chemists and druggists that the photographic material ade has grown to be what it is.—I am, yours, &c., CHEMIST.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—As in the course of the few remarks I made at the cent meeting of professional photographers, I may have appeared deprecate the value of having the names of well-known photoaphers on the Committee of the new Association, I should like to ke this opportunity of saying, with a view of preventing such a nstruction being placed on my remarks, that they took the direction ey did simply with the object of getting there and then a working mmittee from among those present, and others who were known to willing to serve, so as to make a really practical start.

I feel so strongly that, provided they have sufficient interest in the ovement, it would be beneficial to the Association to have the ad ones in the profession on the committee, that, though the meetg did me the honour to elect me on the Provisional Committee, I all be only too pleased to retire in favour of any better-known man illing to serve in my place, my chief desire being to ensure the ccess of the Association which has been so long and badly wanted.

I note in this week's BRITISH JOURNAL OF PHOTOGRAPHY a paraaph headed, "A Correction," in which Messrs. Newton and Co., of leet-street, point out that my firm is in no way connected with eirs; and, whilst fully appreciating their motive in doing so, think only fair to ourselves to say that we have traded as "Newton and ." for the last twelve years, and that, so far as I am aware, we ve done nothing to cause the implied connexion to be made, and ve only written on subjects quite as much, if not more, akin to our own business than to theirs, and have always appended our address. I should not have thought this worth mentioning, but that the wording of the paragraph might be read to mean that we wished to avail ourselves of Messrs. Newton and Co.'s well-known name, such, of course, being far from our intentions.—I am, yours, &c.,

pro Newton and Co., H. W. NEWTON.

19 and 21, Fife-road, Kingston, S.W., March 30, 1901.

PROVINCIAL MEETINGS OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—Re the proposed Photographers' Association, do you not think that it would be a great help if photographers in all the large centres throughout the United Kingdom would join together, and hold a meeting at each centre, the same as, and in accordance with, the one held at Anderton's Hotel, Fleet-street, London, on March 28? It would then give all those who, through being too far away, cannot attend the meeting in London, and who are very anxious to help all they can, a chance of doing their part in the matter. For instance, in such a large town as Manchester there are a great many photographers who are unable to come to London, but who, I am sure, would be very pleased to attend any meeting held in Manchester. Surely in such a large place as that something can be done? Do you not think, as your correspondent "Shamrock" hints, that if some of the leading firms in London and other large towns would give the matter their full support it would great facilitate things?—I am, yours, &c., IN EARNEST.

March 25, 1901.

[Such district meetings will no doubt be arranged for in due course by the Committee. EDS. *B.J.P.*]

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I am very much surprised at Mr. Farmer's letter, on page 151, purporting to be a reply to my communications which appeared on pp. 127 and 141.

Mr. Farmer is in error in stating that I misunderstood his letter of January 25, and that I put a wrong diagram to my illustration on page 127, and again on page 141. My diagrams were correct in each case, and in every particular. I explained in my letter accompanying the first diagram why I used it, which was, in order to carry the idea of "pure colour" analysis to its logical conclusion. The publication of Mr. Farmer's diagrams had not reached this country when that letter was written, and it was exactly the kind of a reply that was called for by Mr. Farmer's letter on page 63, to which it referred. As soon as the publication of Mr. Farmer's diagrams reached this country, I wrote again (page 141), and called attention to the fact that his expression "pure colour" did not apply to either of his diagrams. I then made a new diagram, headed by his "curves" purporting to represent "correct spectrum records for reproducing the colours of natural objects," &c., as given by him in the second column on page 69, on February 1. He now says that I used these "curves" by mistake, and that I should have used the curves which he gave for reproducing the spectrum itself. I am sure I made it perfectly clear that I used his approved "curves" for practical trichromatic printing process work, and showed their application to the reproduction, not of the spectrum, but to dye colours, such as are used in colouring fabrics and other objects which the trichromatic process is supposed to be able to reproduce. The diagram which he gave as representing correct analysis for the spectrum itself I dismissed, after showing that it would degrade the pure green of the spectrum by more than fifty per cent. of white, and gave my reason for doing so. Mr. Farmer has not shown that his analysis for reproducing the spectrum would not introduce the defect which I pointed out, and he has not shown that his analysis for ordinary objects would not break down exactly as I pointed out, and proved by my second diagram. He has asserted the contrary, but in doing so he is entirely in error.

Mr. Farmer refers to the Du Hauron book of 1870, with which I am familiar. I have frequently quoted from it, although I have no copy in my possession, nor access to one, now. The idea of using a "red" orange screen or light had already been explained by Louis Ducos Du Hauron as necessary, because the plates were relatively more sensitive to yellow than to red; and the use of blue-violet instead of red-violet had been declared by him to be a procedure arrived at by experience, and not to be reconciled with theory. Du Hauron never indicated a really definite procedure, because he never gave any spectrum diagrams, and the colour terms admitted of great latitude of interpretation; and it is significant that so long as Du Hauron was an unquestioned authority on this subject, nobody ever reproduced the colours of objects. A fair illustration of the blind way in which Du Hauron was working at this period is his use of eosine collodion plates for making his "orange" record: the actual record must in-

fallibly have been made almost exclusively by yellow-green spectrum rays that got through his "orange" screen.

As for the rest of Mr. Farmer's letter, I can find in it no statement of fact that disproves anything I have said, either in my Traill Taylor Memorial Lecture, or in any of my letters published on pages 47, 77, 127, and 141 of your JOURNAL, or in anything that I have ever said upon this subject.

In conclusion, I can hope that Mr. Farmer's opinions about the Maxwell curve analysis may be generally taken for exactly what they are worth.—I am, yours, &c.,

F. E. IVES.

Philadelphia, March 18, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. P. Milnes, 64, Hanover-street, Stranraer, N.B. *Photograph of "Dawn of Day," Lochryan. Photograph of old Castle, Port Patrick. Photograph of Sunset, Port Patrick. Photograph of Eventide, Lochryan.*

THE PHOTOGRAPHISCHE MITTHEILUNGEN.—H. COOKSON writes: "In last week's JOURNAL there is a paragraph about 'Photographing Wild Animals,' I should be greatly obliged if you could tell me where I can procure a copy of 'Photographische Mittheilungen' containing the photographs of wild animals taken by C. G. Shillings?"—In reply: The "Photographische Mittheilungen" is published by Gustav Schmidt, Berlin W 35, Lutzowstraise 27.

BROMIDE PRINTING MACHINE.—"RAPID PRINTING" writes: I have heard of Urie's automatic printing machine for printing bromides with great rapidity by artificial light. Can you tell me where it is to be obtained and about the price, as I want to turn out large numbers of bromide prints at a cheap rate?"—In reply: Messrs. Marion and Co. are the London agents for the apparatus. We think its price is about twelve or fifteen pounds, but of that we are not quite sure—write to Marion's.

THE POISONS ACT.—"DOUBTFUL" writes: "I think of bringing out a new intensifier, which, I think, will be found better than anything hitherto introduced. One of the ingredients of it is bichloride of mercury, and what I am doubtful about is the Act about poisons. Can I make it, and can it be sold by dealers if I label the bottles 'poison'?"—In reply: You can make it and sell it in wholesale quantities. But it must not be sold retail, except by pharmaceutical chemists. Such is the present state of the obnoxious Poisons Act.

RENOVATING STUDIO.—"YORKS." says: "The roof of our studio lets water through badly. As the studio has to be repainted inside as well as out, do you think this a good time to begin, as I wish to have it all finished by the beginning of the season?"—In reply: We should say that, if convenient, the commencement of the outside work should be deferred till a little later on. The woodwork will have had the opportunity of getting somewhat well dried by the sun. Then a better job may be made of it by the painters than now, when it is probably well saturated with moisture.

CARBON PRINTING.—G. CLEGG says: "I made up a quart of sensitising bath for carbon work as follows—water one quart, bichromate of potash two ounces, and, instead of adding to it half a drachm of ammonia, I, by mistake, added a drachm. The prints were very difficult to develop, and very hot water had to be used—the tissue was almost insoluble. Do you think the extra quantity of ammonia was the cause?"—In reply: No. That was not the cause of the insolubility. Its cause must be sought elsewhere, probably in long drying, or keeping the tissue too long before printing. A five per cent. solution is rather one if the tissue is allowed to remain in it for long, and that will conduce to insolubility.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—A. W. writes: "In reference to the suggested "Pofessional Photographers' Association,' if the idea is carried out, and assistants allowed to join it, would it afford us any help in obtaining employment in first-class houses? During the last few years it seems that almost any one who fails to get on in any other business, and who can gain a slight knowledge of photography, opens a studio, and, in consequence, situations obtained by means of answering advertisements, are often extremely disappointing. I, for one, have been in one or two that have scarcely been endurable even for the week agreed upon."—In reply: We cannot answer questions through the post. The association, we should hope, in the long run, would benefit employers and employees.

LENS QUERIES.—"LANDSCAPE" writes: "(1) When a person has not a special landscape lens for narrow-angle work, do you consider that for a ½-plate the back combination for a R.R. *f*-8 eight-inch focus, giving a sixteen-inch focus single lens, and working at *f*-16 is quite efficient, or would you advise a euryscope of selected French make, *f*-6 or eight inches focus, on account of its giving a single lens of sixteen inches focus, but working at *f*-12? I ask this as I wish to know for pictorial work, whether the former lens having to be worked at *f*-16 with its single combination would deprive a view of a certain amount of atmosphere, and stereoscopic effect, and, perhaps, give too much detail under certain conditions, or would the difference be really one of speed only; if so, would the euryscope possess any advantage? (2) Would the full aperture of the euryscope be useful for late evening scenes, &c., or would a lens of this type have to be stopped to *f*-8 to make it of any service?"—In reply: (1) If the front lens of the R.R. gives too much definition with *f*-16, less may be obtained by employing a larger stop—say *f*-11, or *f*-8. The same applies to the euryscope—the larger the stop the less the definition. (2) Yes, if the lens will give the requisite definition with its full aperture, it will be more rapid than the R.R.

A TONING DIFFICULTY.—"CONRAD" writes: "I was able to obtain the dark chloride of gold at Messrs. Fuerst's, and I thank you for suggesting that firm, but on proceeding to prepare my toning bath I am confronted with a difficulty (at least it is a difficulty to me), and I trust you will help me out of it. The formula is made out in parts, and I have chosen five grains as a part. The water and sulpho-cyanide of ammonia, when mixed, makes a bulk of about 30 ounces, to this is to be added 300 parts of a 1:100 solution of dark chloride of gold. What does 1:100 mean? is it one part in a hundred parts, or one grain in a hundred parts? If it is one part in a hundred parts, then 300 parts of such a solution would take a whole tube, reckoning as I do, five grains to a part. Another difficulty which I encounter is this—it is advised that the first washing of the prints be done in 'still water of sixteen to eighteen degrees, temperature five to six times;' the words which I have quoted being in larger print, evidently to direct special attention to those particulars. I have not tried it, but it seems to me that water reduced to that temperature would be a solid block of ice; but, perhaps, you can explain. The paper which demands this, to me, unusual treatment is, I think, capable of yielding very beautiful results, and I am anxious to work it as it should be worked; it is foreign manufacture, and the instructions are in English, so possibly there is a mistranslation."—In reply: We do not know the formula, but it seems clear enough as the proportions stand. 1 to 100 means one part in 100—one part say one grain—in one hundred grains of water. If you use five grains as a part they should be dissolved in 500 grains of water. With regard to the temperature of the washing water, as the formula is a foreign one, probably the centigrade scale is meant, which would be about 60 to 65 degrees Fahr.—the English scale.

COPYRIGHT QUERIES.—"STUDIO" asks: "(1) Is a man liable if he prints copyright himself on photographs without having them registered? (2) If a photographer takes a person free, and then that person dies (say a woman), and her husband orders one dozen cabinets after she dies, and he pays all demands to the photographer, can the last-named call that his copyright photograph, or does the copyright then belong to her husband? (3) If copyright is stamped on face of photograph, could I copy for enlargements for her husband, without him (the other photographer) taking action against me? (4) Would he have to have negative copyrighted, or would he have to send every photograph? Would you kindly tell me how much it would cost to have one dozen cabinets copyrighted? (5) Would you say how I could get to know whether they are copyrighted, or not, and how much it would cost? Dear Sir, if you will kindly answer the questions, I should esteem it a great favour. There is a great number of people looking for your answers. But I will explain how the case stands. This photographer is an amateur, he happened to take a lady in 1898; six months she died. This happens to be the only photograph of her. So, of course, her husband went and told him to finish off a dozen photographs; but when he got the photographs they were all stamped (I think by a rubber stamp) copyright, and since he got them—the husband—he has brought one to me to be copied and enlarged in black-and-white, but I will not until I get your advice. This amateur has threatened me with law if I copy. I have done all kinds of work for this man, all free of charge, and this is how he is thanking me. So I do hope you will do your best for me, as there are several photographers like myself taking a keen interest in it."—In reply to the foregoing queries—(1) No one is entitled to mark a photograph copyright unless it is legally copyright. (2) If the husband pays for the duplicates it does not give him a copyright in the picture. (3) The mere print of the word copyright does not confer a legal copyright. (4) If the negative is made copyright it will serve for any number of copies, or enlargements. (5) Only by searching the register at Stationers' Hall, and no charge is made for doing that. If this amateur has a legal copyright in the picture, it will be illegal for you to copy it. That you will have to find out. Your best way will be to get an indemnity from the husband, in case the thing is copyright, before you make the enlargement.

*** Many answers to correspondents and other communications are unavoidably held over till next week.

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EX CATHEDRÂ.

Aluminium Books. According to an American paper, we are about to have books printed, not upon paper, but upon thin sheets of aluminium, a process, it states, having been recently discovered. If books, why not photographs? Among the advantages claimed for books so produced are practical imperishability, and power to clean and disinfect them when used in public libraries. It is stated that by the new process the aluminium may be rolled out into sheets one two-hundred-and-fiftieth of an inch in thickness suitable for printers' use, and slightly lighter than paper. Some idea of the extreme thinness of the metal may be obtained when it is noted that these figures would allow of five hundred pages in a book an inch thick only. But we think it a little premature to speak of the imperishable nature of the metal. Any one familiar with unlacquered aluminium knows how readily it tarnishes—in other words, absorbs oxygen from the air, and it is not unreasonable to suppose that these sheets would similarly tarnish, and thus lose their substance and elasticity. Of course in a book closed up mainly against the air, the oxidation would be reduced to a minimum, still it would be a point that would have to be considered. With regard to producing photographs on such material it ought not to be difficult, and they would possess many advantages, not the least being the impermeability of the metallic substratum. One reason why glass pictures as opposed to paper bases are permanent, is the fact that, in the latter case, injurious products may be retained in the texture to the possible future injury of the print. Already we have a growing demand for prints on silver and gold, and paper prepared with such surfaces for photographing upon is now an article of commerce. This kind of picture, however, is subsidiary only, and the demand may fall off as quickly as it has arisen, or, possibly it might be said, was engineered. If the metal, as a photographic base, were to take the place of paper, it would be desirable to give it a white surface, at any rate upon one side. But when we remember what a useful white paint oxide of zinc is, and how the similar metal aluminium gives off such white fumes when burnt with air or oxygen, it should not be difficult to give a surface of permanent whiteness to the new sheets of metal. We shall await with some amount of interest further developments with this promising substratum.

* * *

The Relation of Degrees of Visual Luminosity to Increments of Light. In the Croonian Lecture, delivered at the Royal Society's meeting on the 21st ult., Principal C. Lloyd Morgan, F.R.S., described some studies made with the object of framing, if possible, a scale of visual sensation analogous to, and in correlation with, a scale of physical luminosity. The method employed was a series of rotating discs. The subject is one which may well be noticed by all serious students of photography, from the bearing it has upon scale of gradation in a negative, and the relation to the amount of deposit of opaque silver. Principal Morgan found that when the blackness of a black disc was tempered, so to speak, by the addition of light in various measured extents (the addition being made by ro-

tating a disc with concentric bands of white with black sectors so arranged as to give ten per cent. increments of white), the actual sensation of white or grey was not in proportion to the relative amount of black and white present. Thus, when the black was tempered by ten per cent. of white, it seemed to the eye almost as if a degree half-way between black and white had been reached; but when the full white was tempered by ten per cent. of black the grey sensation was of no great amount. In order to arrive at some means of measuring the actual effect upon the eye, he used slot discs on Maxwell's method. He used a series of five concentric rings—a black, a white, and three shades between. The result he attained may be expressed by saying that when the apparent luminosity altered in equal degrees, that is, in arithmetical progression, the admixture of black and white required to be in geometrical progression. Experiments with colours were made as well as with black and white, but as they are foreign to photographic technics it is not necessary further to deal with them. Suffice it to say that the general result of Principal Morgan's experiments is to emphasise the fact that equal amounts of degradation of apparent brightness are not brought about by equal increments of obstructing material.

* * *

A New Incandescent Fibre for Electric Lamps. Those who have studied the use of mantles for incandescent gas-lights know the extent to which the luminosity is governed by the material made to incandesce. Little attention appears to have been devoted to this aspect of the subject in connexion with electric glow lamps, the chief efforts of inventors appearing to have been devoted to the perfecting and simplifying the production of a uniform and permanent carbon filament. It is a matter of course that increasing the heat of such a filament is followed by increase of luminosity, but to assume from this that luminosity is merely a function of temperature in the ignited body would be quite wrong, the proof being available in the improvements in the Welsbach burners. Here the temperature has been virtually constant all through the varying forms of lamp, but by altering the material of the mantle great gains in luminosity have been brought about, and to an extent that has rendered this light a valuable aid to photography. The perfect ease and simplicity of the "glow" type of lamp for photographic purposes has caused its adoption in many instances where an increase of luminosity would be greatly appreciated, and a recent invention of Welsbach opens out the possibility of this increase being brought about. He does away with the carbon filament, and replaces it with osmium, which, if preferred, may be strengthened by a core of thoria running through its length. As the osmium has less resistance than carbon, the filament is preferably made into a spiral or undulating form, and it is stated that neighbouring turns of a spiral may touch without short-circuiting the current. We are not aware that a claim is made for gain of luminosity for the new filaments, but it seems extremely probable, and once experiment is well under weigh in this direction we have great hopes for an incandescent lamp for photographic purposes which will be as much in advance of the present type as are incandescent gas-lights over the old bat's-wing or fish-tail burners.

Improvement of the Patent Laws. A committee on the reform of the Patent Laws has been sitting for nearly a year, and at the end of last month issued its report. It had to deal with three questions. The first related to the subject of anticipations of patents and the procedure thereon. The second dealt with the power to obtain compulsory licences, and the third with regard to extending the seven months' priority granted under the International Convention. Patents granted from June 1877 to 1899 were examined; it was found that virtually forty-two per cent. of the patents issued had been anticipated, and the committee expressed the opinion that the granting of patents then invalid is a serious evil, and was favourable to the idea that in addition to the existing inquiries an examination ought to be made in the Patent Office with regard to the question of prior publication of the whole or part of any invention claimed to be patented. This is what all authorities have been asking for, for a long time. Whether such suggested amendment is likely to be carried out is, in view of past action, very doubtful. A limit of fifty years, it should be stated, is recommended to be fixed, and publication prior to that time not to be counted against the claim. It is recommended that the High Court have power to entertain and grant claims for compulsory licences when it is shown that the patentees have neglected public interest by reason of their neglect or refusal to grant licences on reasonable terms. The committee with regard to the last question think it reasonable under certain precautions that the seven months' priority granted to foreigners should be extended to twelve. We have briefly touched on the main questions. We can only express a hope, in which many of our readers will no doubt join, that the time may not be far distant when our present Patent Laws shall have some semblance of reasonableness.

* * *

The New Star. Much of a contradictory nature has been written respecting the origin and the composition of the "New Star" in Perseus, but it has been reserved for a writer in the "English Mechanic" to put an entirely new theory before astronomers, and, more than that, to show that, as a result of the theory the sudden appearance of the star almost in the exact position it occupies, was actually predicted in a letter published in the "Birmingham Daily Gazette" for June 7, 1899, under the heading "A Predicted New Star." The letter appears over the signature Samuel Rogers, Birmingham, the writer referring to the prediction as having been made by an astronomical friend, whose name, however, is not given. As this aspect of the matter is not photographic, we merely refer to so important a communication on a matter in which photography has had much to say, and give reference for those interested. The letter appears in the "English Mechanic" (p. 118), March 22 last.

* * *

Substitute for Gutta-percha. Gutta-percha, once largely used in photographic dishes, &c., is now rarely seen; ebonite, and, latterly, celluloid appear to have entirely supplanted it. To some extent this supersession of the old material may be due to its cost, which, too, has always been on the increase, and the fact of a good substitute for it being available may direct attention once more to it. The new

ubstitute (which is patented No. 23,603 of 1900) is both vater and acid proof, and flexible. It is made by kneading nto a dough a mixture of dried pulverised peat and resin il, two per cent. of amyl acetate being used to aid in incor-orating the mass into a homogeneous whole. It is stated hat the addition of ten to fifteen per cent. of rubber in-reases the elasticity, but for photographic purposes it would eem desirable rather to decrease this property, and this, we hould think, might probably be done by the addition of nert mineral matter of suitable kind.

ARTIFICIAL CLOUD EFFECTS.

T is generally admitted that in landscape photography, othing looks worse than a bald white sky, or, as some hoose to term it, a picture absolutely devoid of atmos-here. Hence, in most hand-books and guides to photo-raphy, novices are recommended to provide, in some shape r other, sky negatives for the special purpose of printing n cloud effects, and it must be confessed that often very udicrous results are produced by means of these auxiliary egatives, it being by no means uncommon to see a beauti-ully calm sunlit scene over-topped by an angry, stormy ky. On the other hand, there are those workers who re strong-minded enough to refuse to introduce any sky ffects of a distinctly definite kind into their pictures here they have been taken under what is termed a cloudless sky," and it must be confessed that many of hese workers stand at the very topmost rung of the ladder s photographers, and not unfrequently suffer at the ands of judges and critics, who, as a rule, are generally ound possessed of some crank regarding the non-eupho-ious term, "Pictorial Photography," to whose eyes noth-ng appears right that is not clothed in some ridiculously nreal method of lighting or cloud effects. Whilst we are enning these lines, and the ink is still wet on our manu-cript, the sun is shining in its full glory over the spring ndscape in which the delicate green of the April foliage s appearing. Yet, not a cloud is to seen in the ky, and withal there is just that subtle atmospheric eeling over the scene which, when taken with all its sur-oundings, speaks so eloquently of an ideal April day. t is when dealing with such a scene as this by means of hotography that false impressions are conveyed, especi-lly by the introduction of cloud effects, by means of pecial negatives taken direct from clouds through the amera, and probably as much mischief is done in printing hem as would be the case were the sky left bald and white. Yet there seems to be an unwritten law, that no picture s complete without a sky, probably fostered upon the art ictum that things should not be represented just as they re, but as people would like to see them. In Eastern iews again, we see this same sort of thing strongly exem-lified; but local photographers in such countries as Pales-ine have more courage than most of us in this country, nd firmly set their faces against printing in false cloud ffects in the prints they so largely sell to the public.

It is quite well known that in all cloudless blue skies he tone is heavier at the zenith than at the horizon, and e see this delightfully rendered in many of these Eastern hotographs, in a manner at once so simple and easy of ccomplishment that it is surprising more of this style of printing is not seen in this country. Absolutely cloudless skies, in which the blue at the zenith appears darker than at the sky line of the horizon, are beautifully rendered by the simple operation of sunning down the top portion of the print, an operation so easy of accomplishment by means of a sheet of brown paper and a printing-frame as to be performed successfully by the merest tyro in photography. To enable this to be done: after the print is sufficiently printed, the negative is taken out of the printing-frame and a sheet of clean glass, the same size as the negative, made to take its place; the print is then placed face down on the glass and the frame sprung up. A sheet of brown paper, somewhat larger than the printing-frame, is now placed over the print, and the paper moved up and down in such a way that the sky portion only is affected by the light, at say an open window. By moving the paper gently up and down and permitting the light to continuously affect the upper portion of the print, whilst the lower receives less, and very little indeed just at the horizon line, an exceedingly good effect is produced. A little practice will soon teach any one who, for the first time, suns down his skies, how far he could carry the printing, and should any objects, such as a tall chimney, a spire, or a tree extend over the sky line, the same may be disregarded, as the reduction is so slight as to be unobservable in the finished prints. There are, however, other subjects in which we see present only the faintest possible semblance of clouds, and here, again, the same ridiculous treatment is often practised of printing in sky effects by means of strongly defined sky negatives that might lead any one to suppose a thunderstorm was on the point of bursting on the scene. Subjects of this kind are quite easily dealt with also, without robbing the same of their natural appearance, or printing in false effects by means of cloud negatives photographed from nature. Although in subjects of this kind the operation does not require the aid of what may be termed a sky negative, yet such effects are best produced by what is more properly termed artificial sky negatives, the production of which is in reality quite an easy matter.

Many really natural effects are obtained by merely strengthening a negative at its sky portion by means of a suitable pigment on the glass side, thus doing away entirely with the need of double printing, or using a second negative at all; but numberless cases will be met with where such treatment cannot be applied by reason of an over-dense sky in the original negative, and it is in cases of this kind that a sky or atmospheric effect has to be introduced by means of a specially prepared cloud negative. With many workers the practice exists of purchasing one or two sky negatives (and, as a general rule, they are good enough in their way), but the fault lies in making them do duty for every picture that wants a sky being introduced, and also in many instances results in printing in a distinct sky effect where only the semblance of the softest fleecy clouds or, more properly expressed, atmospheric effect should be portrayed. The question is often asked: What is the best method to employ to produce artificial sky negatives, in contradistinction to such negatives photographed direct from nature? Such a question is not easily answered, simply by reason of the fact that "personal equation" plays such an important part in their production, for one worker will by reason of his experience

in the printing room, where all necessary materials are generally at hand, take up a clean sheet of glass, the same size as the negative that has yielded the print, and in two or three seconds of time will produce an ideally perfect negative for the purpose required, whilst others not possessed of such knowledge and experience will go messing round for hours and not produce a satisfactory result after all. How then is it so simply produced? it may be asked. The answer is as follows: Take a clean sheet of glass, same size as the negative, and having at hand a small tube of crimson lake (or any other equally suitable transparent oil pigment), smear one side of the glass with a very little of the pigment, and then by means of the ball of the forefinger proceed to work the pigment into forms resembling a sky. To do this only a very small quantity of the pigment should be applied to the glass at varying distances apart; by this means the oil colour will be distributed nice and evenly, and the shape of the clouds easily produced. The glass shield so prepared is then placed in the printing-frame, the oiled surface of course outside, just as if it were a negative; brown paper is again used to cover the print when it is placed in the frame on the glass, and the same operation as in sunning down is again performed. The result is a delightfully soft sky effect that will surprise those who have never seen the operation performed in this manner. Oil pigments are peculiarly well adapted for this purpose, and very little practice is needed to work the same into suitable shapes on the glass.

There are several other methods of producing artificial sky effects. A little red ink incorporated with gum has been recommended by some workers, but a transparent oil pigment that is recognised as a good dabber in transparency colour work is, in the opinion of many, by far the better medium to employ, simply by reason of the fact that any degree of transparency or depth can be easily acquired, and it is nice and clean to work with, requiring no time to dry before being used. Another method that has been strongly recommended for the production of imitation clouds is the using of sheets of celluloid. These are worked upon by means of a stump and black lead, but in doing this a worker is apt to strive after a somewhat too fine niggling effect—whilst with the oil pigment and a sheet of glass, a much broader and softer effect is produced. Many negatives will come to hand in which there are present faint outlines of the original sky present when the plate was exposed, but in such a weak form as to show no result when the finished print has passed through the various stages of washing, toning, and fixing. When these come to be dealt with, an oil pigment is simply invaluable, for with a camel's-hair brush a "soupcon" of crimson lake may be applied to the parts on the glass side of the negative, and then with the ball of the forefinger the pigment is dabbed down, thereby strengthening the image just where it is desired, over the clouds, as shown in the negative. Cotton-wool was largely employed at one time, and in the hands of an expert printer, or one who has from practice with this material come to know the best method of using it, yields very good results. As a rule, however, novices keep the wool on too long and produce patchy effects with its aid. Experienced printers know how to avoid this patchiness, however, and sometimes employ the same in conjunction with flour or other similar substance dusted over the surface of the negative. Ground glass made semi-transparent at different parts of its surface by means of oil or other suitable mediums, is also a first-rate thing to employ when the negative has a poor, weak sky and it is only advisable to block the same out. In selecting any of these methods, of course, much will depend upon the class of negative being printed, and the special effect desired; but a transparent oil pigment, such as crimson lake, is a great power in the hands of an expert printer and it is quite wonderful what he can accomplish with its aid, even to the production of vignettes, by applying the pigment denser in some parts than others, and by dabbing the gradations until they recede into clear glass.

"PHOTOGRAPHERS, ORGANIZE!"

I DO not know whether the situation ever appeals very strongly to home readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, but we in America, as we carefully turn its pages week by week, cannot fail to be struck by the persistence of the cry of fear and the steady clamour against the things that be.

It is not always pleasant to criticise, and criticism is seldom appreciated; but, if I refer at times in this article to the British photographer in somewhat disparaging terms, I hope in return to suggest to at least the individual a way of escape.

We hear much of dire misfortune; the amateur has for the present retired before the greater evils, but the Parisian free portrait bloom perennial (and with much gratis advertisement), and now the proverbial pound of tea gives place to a packet of cigarettes or a paper of soap.

There is an American saying: "What are you going to do about it?" It is rather a troublesome question at times, when the enemy is hard fact, and can be opposed with nothing but talk. For years the woes of assistants—expressed through an enthusiastic and, I fear, self-appointed mouthpiece — have been blared forth, with what practical success I know not, and now "something must be done" to protect the poor master from destruction. We must put down the fraudulent somehow. We must amend the Copyright Law some day. How and when?

How is the American photographer situated in regard to these things? Curiously enough, if only he knew it, he is as hardly treated as his English cousin; but he knoweth not. There is a custom in America, especially in the smaller towns, of giving coupons with groceries and similar purchases. When coupons to a given value are held, they may be exchanged for "premiums" chosen from among many things, and a favourite offer is a dozen cabinet photographs.

I have seldom seen the free enlargement (but-you-must-buy-the-frame) advertised, but more than once, calling in at some workman's cottage or at some lonely farmhouse, I have seen the enlargement itself. The scheme is usually worked by a glib-tongued canvasser, and on the whole he pleases his patrons; for they realise that something for nothing cannot be, and they think that picture and frame together are worth their price.

There are at least two or three firms in America that do a large enlargement business on the "without hindrance to present employment" basis. They teach workers by correspondence (for a consideration) in their own homes, and guarantee work to competent people. Their plan is to send the crude enlargement to the pupil and the pupil works it up. These firms must have a large turnover, for they advertise, using much space, in magazines whose circulations run into the hundreds of thousands. And it is by no means certain that their income is derived from selling crayon outfits to innocents. They may (and I believe they do) take large orders for enlargements sold through agents, or to be given as premiums by some tradesman or some magazine. Certain it must be that, even if they were frauds, they must leave a strong aftermath of students who can work up an enlargement in good saleable manner, for there number thousands of bright, ambitious men and women among the

dents. In the mining districts, or among the careful German and rse element in the North-west, these enlargements must have a e sale.

There are migratory firms who will invade some quiet country n with flaring advertisements and much special offer. They will r six months, photograph every living soul, and be repeating mselves in a new field before the poor resident photographer has te grasped the drift of things.

t is possible that an amendment of the Copyright laws might do ething for British photographers, though the possibility could dly be grasped by the American, for to him the English law is l. In America it is theoretically possible to become wealthy ond the dreams of avarice from the proceeds of a single successful secution for infringement; but in practice the illustrated press y laugh at threats, for legal action usually ends disastrously to the secutor.

The amateur question is, I suppose, much the same in England and America. Many of the photographers in small cities have availed mselves of the opportunity to become small dealers. Where they ceed in obtaining the local Kodak agency their success is assured. e larger men are, of course, above the reach of any adverse ateur influence, as in England. But it is a significant little fact t, when the amateur was discussed at a recent State convention, all but unanimous decision was in his favour.

The usual practice in America is to pay a price for an article conbrably higher than would be charged in England. But photophy is equally cheap in both countries. Prices which would make English photographer envious are indeed paid (as they are, too, der similar conditions in England) but they are very emphatically d for value received. Mr. Falk has for years supplied cabinets at o guineas a dozen, and I very much doubt if an English photopher in the same rank is working at such a rate; and much of the rk turned out in small cities at twelve-and-sixpence a dozen binets) will compare favourably with some high-priced London work t I have recently seen. When we read (to take an extreme case) Mrs. Käsebier receiving ten dollars for two prints, we are apt to nk of the millennium. But Mrs. Käsebier limits herself to two ers a day, and she works hard with them. If her results do not ase her—perhaps after she has made a score of apparently satistory prints in her vain attempt to hit exactly what she wants—the ing has to be repeated. The print obtained, it is mounted with ch care; so much care, indeed, and personal time are given to each nt that commercial success would seem well-nigh impossible at the ce. And so it is all through. If a man gets a good price, it means t he can do good work, and that he knows his worth.

There is a profitless and never-ending discussion as to whether otography is an art. I suppose all intelligent men hold much the ne opinions on the subject, if only we could get down to fundantals. But the co-relative question — is the photographer an ist?—suggests a doubt as to whether some photographers are to be ssed as skilled artisans—along with joiners and mechanics—or h the unskilled labourer or longshoreman. For there is such a peless wail of "Darkest England" in some of the plaints as to ggest that the wailer has neither skill nor strength of purpose to e above any wave of adversity.

The reason that the American photographer rises superior to these tty annoyances is that he is a better man and does better work. I not going to endeavour to prove this, but propose instead to give few pointers as to *why* the American is better, and the means ereby he has attained his position.

First, perhaps, I would place the spirit of fraternity, There is no ty jealousy among the photographers, and the word they apply to mselves—"the fraternity"—is aptly chosen. The fraternity is l of the ramifications of good-fellowship. A western man comes New York, and *en route* he calls and picks up a friend. They call a photographer in the city, and are received with open arms. ey discuss their businesses and their methods, and mutually get ats. Some unknown provincial will invade the metropolis, and he ll call on Falk, or Core, or Hollinger, and be received with as much urtesy as though he were a peer in the photographic world. Falk ho has spent a fortune in his Waldorf-Astoria Gallery, will step on to his balcony, from which a wonderful view of New York and its harbour may be obtained, and far below him he will point to the skylights of four or five-story houses and explain how photographers are ever congregating. They all feel, with him, that as long as their work counts they have little to fear. They know that each has his own level or characteristic, and that they work on parallel lines rather than on clashing ones. And they have that confidence in their work which makes them say that, if abnormal overcrowding should make New York undesirable, they can at any time leave it and make a success elsewhere.

The American photographer is wide awake in many ways, and he is not pig-headed. Many times I have turned over the folios of men, whose names are known on both sides of the Atlantic, and we have discussed their work as frankly as though it were the work of some unknown third party. This line might be more graceful, or that light should be toned down; and, when some defect is noted, he will endeavour to repeat the picture without the defect. For there is joy in his soul when he is at his work. I spoke to a well-known English photographer about glossy bromides. He did not know that bromides could be glossy; and he did not know how to make a carbon print, though his windows showed some fine work from the Autotype Company. In America, some photographer from some little outlandish place—maybe Painted Post, or Punxsutawney—will vex his soul over gum bichromate or over the mysteries of toned platinotypes. When he finds himself in trouble he will buy everything bearing on the subject and digest it. I hold no brief on behalf of THE BRITISH JOURNAL OF PHOTOGRAPHY, but I must say that the American photographer buys and reads his papers. There are no weekly photographic papers in America, but there are many monthlies, and he takes several of them, ranging from *Wilson's* at three dollars a year down to the little sheet, nominal in price, published by his stock-dealer. Very often, too, he takes THE BRITISH JOURNAL OF PHOTOGRAPHY, and, if his nationality or descent permits, he may take a Continental paper. He easily spends two to three pounds a year on his magazines, and in addition subscribes to some of the art journals.

The American photographer has his conventions. There is a National one, at which as many as six hundred or seven hundred photographers have met, and there are many local ones. There is never a National Convention to which men have not travelled thousands of miles, and they go in hundreds to their local State Convention. They have a great exhibition of pictures, with medals in many classes, and they have their business and educational meetings. They have practical demonstrations, when two or three competent men will pose and light some unfortunate impounded from the audience. They have their lecturers, too, men who are artists with the brush or in clay, to speak on the endless theme, and sometimes these artists are asked to candidly criticise the exhibited pictures in presence of the producers thereof. And the photographers themselves argue and debate round their exhibits, swapping stories and experiences; and at the end of a week of royal good fellowship they wind up with a final giant picnic at the hands of the poor unfortunate dealer. No man can attend such a show without real practical result; and the man who is endeavouring to climb finds invaluable help.

The photographer in America puts in many hours of earnest study, and instead of merely becoming a perfect technician he becomes a man of temperament, with reflection in his work. He does not grow his hair long or go off at any tangent. He is sound in his business methods, eats three good meals a day, and smokes a good cigar. If he thinks it advisable to his business, he will advertise himself in the most barefaced way, and we have, too, in America as in England, an occasional blatant self-praiser. But the good man does not puff himself needlessly. Take the case of Steffins, whose work is never seen, and who hails from that supposedly crude place, Chicago. Steffins is a man who does the most beautiful work—good, straight, old-school photography. He understands handling the figure, he is a master of lighting; his technique, from exposure to retouching, is perfection. But he works without display—not even a show-case—and his work is never exhibited. If you wish to know what Steffins is doing, you must call on him, when, as the Spaniards say, "his house is yours."

The American must be incapable of quite appreciating the British

point of view. To him it appears that all men have an equal right in business, and he believes that no man works for love. If he is charging three dollars a dozen for his prints, and a competitor comes along with work at half the price, he may, perhaps, curse, but he will accept the inevitable. If his work is better than that of the new man, he has not much usually to fear, if only he wakes up and takes wise counsel with himself. If the new man can equal his work, well, there's the hard fact, and it must be faced.

I have ventured the rather blunt assertion that the American photographer is the better man. This is, perhaps, best shown in the great number of well-known names and the even way in which they are dotted throughout the country. In Cincinnati, for instance, are Benjamin and Somers and Brenner. And Dudley Hoyt, who, a couple of years ago, obtained the R.P.S. medal, produces work of a consistently high level, and yet merely shares the honours of a town smaller than any of a score of British ones. But this same characteristic holds throughout. There are men in towns of ten thousand and under who are doing careful, creditable work, and are receiving what they consider adequate remuneration. They shun isolation and they shun a narrow groove, and therein lies their strength. A few of the leading professionals of America know and understand the amateur school more thoroughly and more understandingly than many of the amateurs themselves, and I might almost add they equally appreciate its strong points.

I have more than once written—I don't claim the remark as original—that the man who will organize is usually the man who need not organize. The old Benevolent Association was supported by people who were not in the least degree likely ever to make a claim on its funds; and those photographers who faithfully put in an appearance at the N.A.P.P. meetings were more likely to raise others than to require raising. Any one attempting to organize or strengthen photographers will, I fear, merit the respectful sympathy of those who have fruitlessly preceded them. But if coherent advance is impossible, at least the individual can raise himself by following the American plan (commonly supposed to be typically British) of downright hard, wakeful work. Let him break away from routine and rule-of-thumb work. If he must vignette, at least let him know why, when, and *how*. There is much vignette work displayed in London that is bad—bad with an emphatic adjective. Let him see what other people are doing, rub shoulders with his fellow-worker—his hated rival if you will—and compare notes. Why should not the photographers of a district have a meeting and compare their work? Let them, if they wish, have medals—and a brass band. At least, if they are discontented let them grasp the fundamental, that it is the discontented one, and not *somebody* who must do something. If the sufferer can take the profession along with him so much the better, but do not let him wait before starting.

WILLIAM EDWARD WARD.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

IX.—NEUHAUSS AND SCHÜTT.

WE begin with a list of papers on the *process*.[1]

R. Neuhauss, "Die Photographie in natürlichen Farben," Eder's *Jahrb. f. Phot.*, ix. (1895), 186–192, *Beibl.*, xx. 651; Eder's *Jahrb. f. Phot.*, x. (1896), 20–23, *Beibl.*, xx. 984.

Neuhauss ("Uber die Photographie in natürlichen Farben," *Verh. d. physik. Ges. zu Berlin*, xiv. (1895), 17–24; *Beibl.*, xxi. 418) communicated some experiments and raised some objections to Zenker's theory.

A. and L. Lumière, "Untersuchungen über die Herstellung einer lichtempfindlichen kornlosen Schicht," Eder's *Jahrb. f. Phot.*, xi. (1897), 27–30; *Beibl.*, xvi. 980.

G. Lippmann, *Roy. Inst. of Great Britain*, 1896, 6 pp.; *Proc. Roy. Soc.*, lx. (1996), 10–13; *Beibl.* xxi. 418.

With regard to the problem of isochromatism in interference photochromy, C. Bonacini [2] pointed out that the problem to give the colours in their correct relative intensity was quite a different one from that of ordinary orthochromatic photography. In the latter, one has to pay attention to the value of different colours for our eye, and thus to obtain a spectrum of sunlight in the form of a reduced silver strip whose density varies from place to place. In the former, the colours must appear in the same objective intensity as in the original the plate must be equally sensitive for every region of the spectrum *i.e.*, it must, in Bonacini's terminology, be *isochromatic*, as opposed to *orthochromatic*. Bonacini discussed the practical views of a realisation of this with the present (1894) means, and concluded that on the one hand it was easier, but, on the other hand, one cannot be satisfied with an approximation, as one can with orthochromatism for the tone of compound colours would then be altered.

While the Zenker-Lippmann theory was accepted by the brothers Lumière, Krone, Valenta, and others, Neuhauss[3] recognised a distinct grain in Lippmann photochromes, and, by measurement of single grains, concluded that a much finer and yet regular layer is not very well to be thought of. This objection is not, according to Wiener, valid, yet F. Schütt,[5] took up the question again because the doubt appeared to need further testing, since Meslin[6] showed that by no means only are simple colours reflected from spectrum-photochromes and also Lippmann had not brought the correctness of his conclusion to experimental proof.

After a description of the appearances of spectrum-photochromes by reflected light[7] and when used as transparencies,[8] he from these appearances drew conclusions as to the nature and origin of the colours.[9] The colours are undoubtedly due to interference, and the presence of thin laminæ is made highly probable. It remains to test whether the silver grain demonstrably present, whose magnitude far surpasses the distance of the hypothetical laminæ from one another, is reconcilable with such a supposition.

Schütt was thus led to examine more closely into the nature of this grain;[10] with a seventy-one-fold magnification, a fine punctuation of the film was visible. With greater magnifications it was seen that not the non-transparency, but the different refractive power of the grain from that of the gelatine conditioned the visibility, as with uncoloured bacteria only the limits stand out distinctly from the surroundings, and the visibility markedly decreases with a greater aperture of the lighting apparatus. A doubt whether it is a case of a silver grain inside the film, and not a graining (Körnung) of the gelatine surface cannot exist, for the grain appears thickest in the places the most acted on by light.[11] To establish, now, how many grain-layers (Kornschichten) lay on one another in the gelatine Schütt used a 320 to 720-fold magnification and found, nearly a Neuhauss, the greater number of grains to have a diameter of from 0·0007 to 0·0009 mm. The thickness of the film was measured with some difficulty, and found to be not greater, but also apparently not much less, than 0·0012 mm. Hence the astonishing result, that the thickness of the layer was not greater than the diameter of the silver-grains in it. This would dispose, of course, of the idea of a laminal formation by the grains, and one is left with the idea of a laminal formation *in* the grains.[12]

If this view is correct, the coloured reflection will be less powerful in the spaces between the silver-grains than from the grains themselves.

[1] It may be mentioned here, as an instance of the possible *application* of the interference method to scientific questions, that in 1896 Lord Kelvin (*Nature*, liv. (1896), 12, 13; *Beibl.*, xx. 779) discussed the applicability of Lippmann's method for determining the wave-length of Röntgen rays. Later research showed that this could give no result, on account of the diffuse reflection of these rays.

[2] *Bull. della Soc. Fotografica Ital.*, 6th year, 24 pp., 1894; *Beibl.*, xix., 71–72.

[3] *Phot. Rundschau*, viii. (1894), 295.

[4] *Wied. Ann.*, lv. (1895), 225.

[5] "Innerer Bau und optisches Verhalten der Lippmann'schen Photographien in natürlichen Farben." (Berlin, November, 1895.) *Wied. Ann.* lvii. (1896), 533–554.

[6] *Ann. Chim. Phys.* (6), xxvii. (1892), 369.

[7] § 1, *op. cit.*, 534.

[8] § 2, *op. cit.*, 535.

[9] § 3, *op. cit.*, 535–536.

[10] §, *op. cit.*, 536–544.

[11] Neuhauss had (*loc. cit.*) refuted this doubt in another manner.

[12] A justification for entertaining this idea was given, *op. cit.*, 537–538.

Schütt examined a spectrum-photochrome with greater magnification under nearly perpendicular light, which was thrown on to the object through the microscope eyepiece by means of a totally reflecting prism. The expected appearance of fine coloured points on a darker ground did not show itself, but a very fine and distinct two-coloured graining of the film. However, this, according to Schütt, can serve as a verification of his view, for naturally the places occupied by the grains must behave in development, fixing, and drying, somewhat otherwise than the intermediate, poor in silver, parts. Hence the laminæ cannot possess everywhere the same quality and exactly the same distances, and thus cannot reflect the same colours. In the blue and violet a red distinctly appeared in the ground-colour.[13] Unfortunately a direct connexion between this red and the grains of the plate could not be established, since the one was only visible in reflected, the other in refracted, light. Thus, Schütt satisfied himself with having established that coloured reflection takes place also at those places occupied by silver grains, and regarded this as a verification of the view that lamina-formation can exist also inside the grain.

Zenker's hypothesis on the structure of the laminæ[14] is disposed of by the following facts:[15]

1. Every single lamina is to be considered as in the highest degree transparent, since the totality only slightly weakens the light passing through. But a transparent lamina between two homogeneous media reflects nearly as much light at its upper and lower surface, only in the two cases with opposite direction of vibration, so that, if its thickness is vanishingly small, all the reflected light is annihilated by interference.

2. The light-action is rigorously only zero in those planes in which the vibration-nodes of the stationary waves lie. Thus it is unthinkable that a reduction exists only at the maxima of action. It were thinkable that the silver-separation exists *everywhere*.

3. Finally, one cannot speak of a connected (zusammenhängenden) silver layer. That is shown by the behaviour of moistened photochromes. The colours first pass over into these with greater wavelength, then the metallic lustre of the colours begins to go, and finally the light reflection cannot be distinguished from that of a common transparent gelatine film. Since an actual silver lamina is not altered by dampness, the laminæ lying above one another could not lose the power of reflection by the mere thickening of the intermediate layers of gelatine.

Also Lippmann[16] has modified his view in the same sense. But his hypothesis that the light-reflecting molecules are distributed periodically according to a certain law in a homogeneous, optically unvaried gelatine layer is susceptible of attack. The homogeneity of the gelatine after the action can hardly be retained, and the attempt to replace laminæ by molecules is not permissible, for single molecules cannot reflect light waves.

We shall continue the account of Schütt's paper. It is instructive, though the objections are not well founded, and on a matter of principle the fullest discussion should be invited.

Cambridge, March 22, 1901. PHILIP E. B. JOURDAIN.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

I.

REFERENCE having been made repeatedly of late in these columns to Von Hübl's work on trichromatic photography[17], the following digest of his theory may not be unwelcome to those who are interested in the subject whether as beginners or experts. The preliminary considerations as to the vibratory theory of light and the formation of colour we may pass over, and the first point which strikes us as important as regards three-colour printing is his definition of the constants of a colour, which are "purity" or the absence of black, "saturation" or the absence of white, and "brightness" or "intensity" a specific property which must not be confounded with the term bright as used when speaking of a bright blue, which means a blue with some considerable admixture of white. The brightness of a colouring matter is lower the broader the absorption bands this colouring matter shows in the spectroscope; and, inversely, th broader the reflected spectral band appears, the greater the specific brightness, up to a certain point; but too wide a reflection causes a sensation of "whiteness," and he deduces two axioms: first, that a pigment possesses relatively the purest colour when the reflected spectral zone is somewhat smaller than the distance of two complementary colours; and secondly, that, if the reflected zone is narrower, blackish shades are formed, and, if it is broader, whitish shades of the colour appear.

Hübl then deals with the mixture of colours by geometrical construction, and imagines two points, A and B (fig. 1), which may

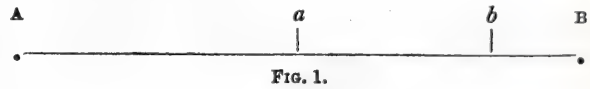


FIG. 1.

represent any two colours, such as A yellow, and B red, then any line joining these two will represent the compound colours which may be formed by admixture of the two, and, if each point represents the full or saturated colour, any point on the line will at once tell us the components of the mixture in definite parts; for instance, the central point *a* will correspond to equal weights of yellow and red, whereas *b*, which is one-fifth of the total distance from B, will contain four-fifths of red and only one-fifth of yellow; thus, the nearer the saturation point of a colour, the more of that colour exists in the mixture. For the geometrical construction of the mixture of three colours he assumes an equilateral triangle, and if we set A as yellow,

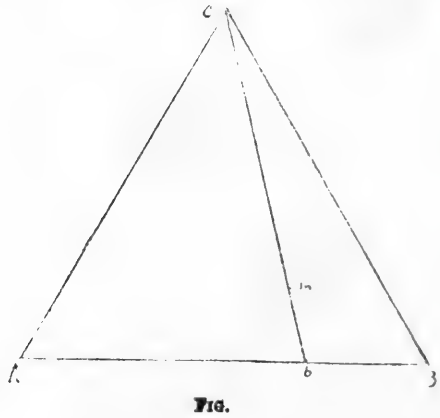


FIG.

B as red, and C as blue, it is obvious that all mixtures of red and yellow will fall along A B, all mixtures of yellow and blue will fall between A C, and all mixtures of red and blue along B C.

In order to find the position of a mixture of all three colours, it is only necessary to find the position of the centre of gravity to find the particular shade that is given; thus, with a mixture of 1 part yellow, 2 parts red, and 1·5 blue, we find first the position of 1 yellow and 2 red or 3 orange = *b* in fig. 2; then the line *b* C is now weighted towards *b* with 3 units and towards C with 1·5 units, and the centre of gravity of this line is in *m*, because C *m* = 2 *b m*, and *m* is therefore the centre of gravity of the whole system and corresponds to a colour mixture of 3 parts of orange and 1·5 parts blue or 1 part yellow + 2 parts red + 1·5 parts blue.

It is hardly necessary to pursue this point any further, but enter upon the next principle of Hübl, which arises from the above, and which is based upon the use of his equilateral colour triangle in a circle of the colours.

In order to construct this circle four of the fundamental colour pigments were chosen, and cadmium yellow as the fundamental yellow as it has neither a reddish nor a greenish tinge, and as the fundamental green, acid green dissolved in gelatine was selected,

[13] [Cf. the views of Lippmann (1894) noticed before by which this may also be explained.—P. E. B. J.]

[14] Also held by Meslin (*Ann. Chim. Phys.* (6), xxvii. (1892), 369).

[15] *Op. cit.*, 539-540.

[16] *Journ. de Phys.* (3), iii. (1894), 97.

[17] "Die Dreifarbenphotographie mit besonderer Berücksichtigung des Dreifarbendruckes und der photographischen Pigmentbilder in natürlichen Farben," by A. Freiherrn von Hübl. Published by Wilhelm Knapp, Halle-a.-S. 1897.

and the colour of this lies close to B towards F in the spectrum, which Hübl arranges around the periphery of his outer circle, the centre of which is black, the other two colours must be complementary to these and would therefore be ultramarine and a mixture of eosine and erythrosine lead compounds. Round the circle were placed a number of pigments with narrow bands of reflection, some commercial inks and others pure aniline colours, and, as only colours of equal fiery hue were chosen, they were all placed equally far from black, and therefore fall in one circle, and the saturation of the colours is such that equal quantities of pigments diametrically opposite to one another, mixed together, will give a grey or black, and that a mixture of two dyes in equal parts will give a colour which is the mean of the colours and the two components.

Pigments of equal purity are always equally removed from black

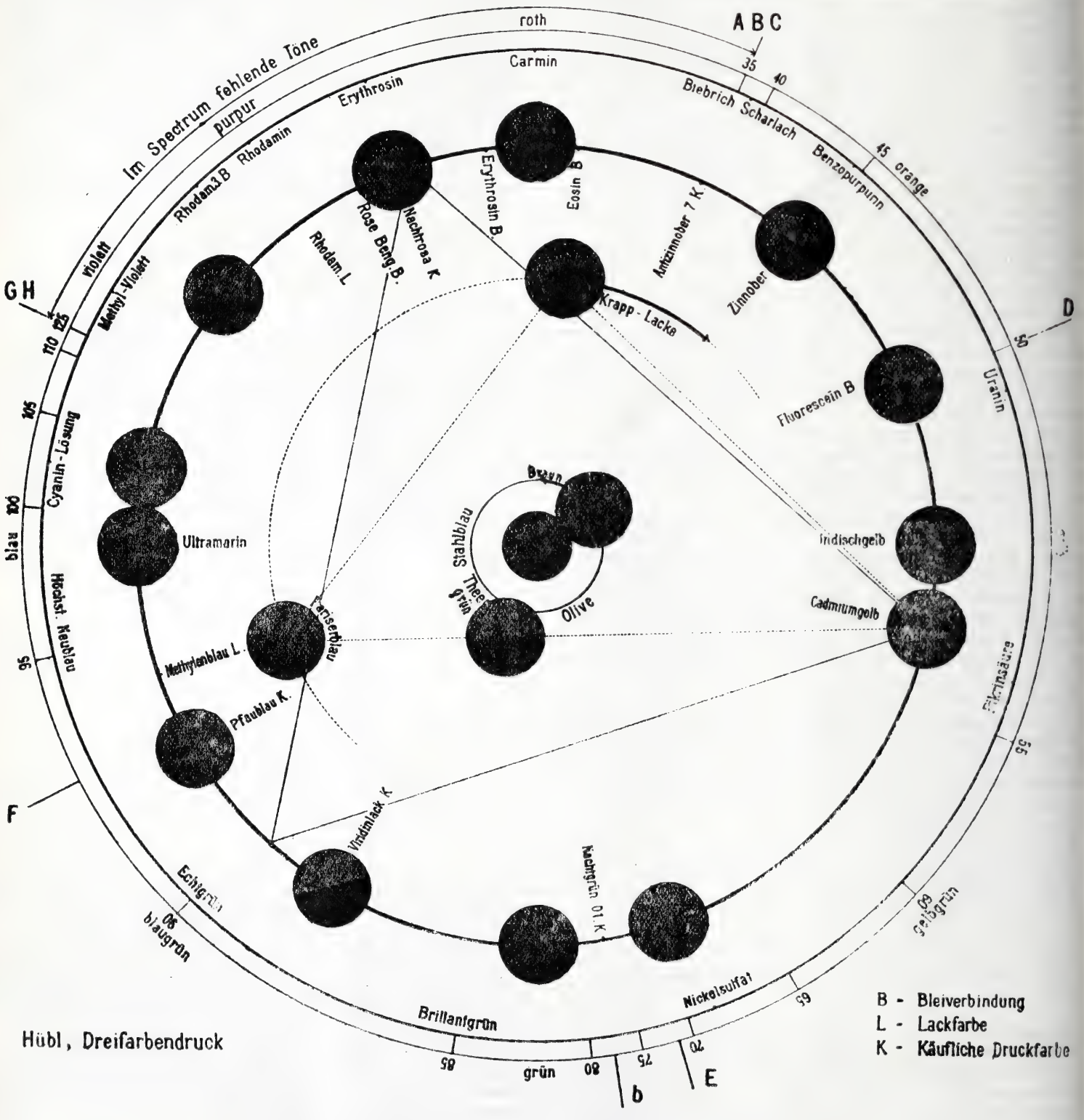


FIG. 3.—KEY TO GERMAN TERMS ON CHART, READING FROM OUTSIDE TO CENTRE.

Orange = Orange.
Gelb = Yellow.
Gelbgrün = Yellowish green.
Blaugrün = Blue green.
Blau = Blue.
Violett = Violet.
Purpur = Purple or crimson.
Roth = Red.
Im spectrum fehlende Tönes = Tones wanting in the spectrum.
Biebrich Scharlach = Biebrich scarlet.
Benzopurpurin = Benzopurpurine.
Uranin = Uranine.
Pikrinsaure = Picric acid.
Nickel Sulfat = Nickel sulphate.
Brilliant grün = Brilliant green.
Echtgrün = Echt grün.
Höchst Neublau = Höchst new blue.
Cyanin-Losung = Cyanine solution.
Methyl violett = Methyl violet.
Rhodamin 3 B. = Rhodamine 3 B.
Rhodamin = Rhodamine.
Erythrosin = Erythrosine.
Carmine = Carmine.
Antizinnober 7 K. = Antizinnober 7 K.
Zinnober = Vermilion.
Fluorescein B = Fluorescine.
Indischgelb = Indian yellow.
Cadmiumgelb = Cadmium yellow.
Nachtgrün 01. K. = Nachtgrün 01 K.
Viridinlack K = Viridine lake K.
Pfaublau K. = Peacock blue K.
Methylenblau L = Methylene blue L.
Ultramarin = Ultramarine.
Rhodamin L = Rhodamine.
Rose Bengal B = Rose Bengal B.
Nachtrosa K = Nachtrosa K.
Erythrosin B = Erythrosine B.
Eosin B = Eosine B.
Krapp-Lacke = Madder lake.
Pariser blau = Paris blue.
Theegrün = Tea green.
Stahlblau = Steel blue.
Braun = Brown.
Olive = Olive.

B = Lead compound. L = Lake, K = Commercial printing ink.

d lie in a circle of the same diameter; the st able broad-banded inting and printing colours show a relatively black appearance and erefore lie nearer the middle. The outer line represents the colour rcle of aniline dyes in transparent gelatine sheets, and, as these ow relatively a purer hue, they are placed further from black.

By the aid of this colour circle the following questions can be at ce solved: first, the result of the admixture of two colours and so the necessary constituents to form any colour; secondly, if the ints corresponding to any three colours are joined up to form a iangle, this will contain all the colours that can be compounded om the same, and the greater the area of the triangle the greater e number of the colours that can be formed, and three colours that ake an obtuse-angled triangle cannot give a black or grey.

With regard to the first point, this circle is also useful in that it ables one to determine the amount of black in any mixture with- t experiment, as the further the two colour points are from one other the blacker the resultant mixture, and, if they are exactly 0° apart, then they form black, or with less saturated colour a utral grey. Looking at this circle, it is obvious that gelatine- ined sheets of benzo-purpurine and echtgrün, will give almost a utral grey. It will also be seen that Paris blue can be made by a xture of brilliant green and methyl violet. If by sector or any her measurement a colour is placed in this circle, it is only necessary draw a straight line from the same through the centre to the posite side to find the place in the spectrum which corresponds to e mean absorption of the colour; for instance, a line drawn from chtrosa will cut the opposite circumference at 68 on the empirical ale of the spectroscope which corresponds to $D\frac{4}{5}E$.

Hübl points out that the theory of trichromatic printing may be vided into two parts, one which deals with the choice of a suitable our system, and the second which treats of the preparation of the gative, and that, although the former is absolutely independent of latter, yet they are in such close connexion that they can hardly separated.

If, says Hübl, only three colours are to be used to reproduce a large mber of compound colours, it is necessary the triangle inscribed in colour circle should be as large as possible, and the colours must be osen which are as far removed from black as possible, and that the angle must be equilateral; and, to fulfil the first condition, we must the pure fiery colours on the outer periphery of the circle, and t to fulfil the second, the colours must be at equal distances apart the periphery. Further, that colours with narrow bands of ected light are permissible, as only these will satisfy the laws of our mixtures, and therefore any three narrow-banded pigments arated from one another by 120° can be used, and, therefore, re are innumerable usable colour systems from the theoretical nt of view, but that practically this is not so because our eyes are equally sensitive to the colours, and that, whereas considerable ntities of grey may be mixed with blue, violet, or green, without ably prejudicing the colour sensation, yet yellow is very soon dered useless by small admixtures of grey; therefore yellow not be formed by admixture of pigments and it becomes therefore only apex of of the equilateral triangle, and the other two colours 120° distance must be blue-green, and purple, or crimson. The ngle corresponding to this is that inscribed in fig. 3, and which has ts corners cadmium yellow, nachtrosa and a colour near viridine e. The exact nature of the colours is immaterial as long as they sfy the theoretical requirements, and therefore, to form the blue- en, we may use one part of peacock blue and two parts of viridine e, and further slight variations in these fundamental tones may be de without any considerable harm, thus, for instance, nachtrosa y be replaced by rose Bengal lead compounds.

f in the superimposition of stained images process the funda- ntal colours on the extreme outer circle be chosen, such as naphthol low, erythrosine, and echtgrün, the colour triangle is amply icient for all natural and pigmentary colours.

n account of their fugitive character, however, the aniline colours not much used for three-colour printing, but the more stable ours of chrome yellow, madder lake, and Paris blue, a combination will be seen from fig. 3 and also fig. 4, which gives unsatisfactory lts in the violets and green.

It is essential that the three monochrome prints be of the same intensity, and that the colours when mixed in pairs in equal weights must give a full orange, a full green, or full violet, and when all three are mixed a full black, and this is only attained when the centre of gravity of the triangle corresponds with the centre of gravity of the circle. If, however, as in fig. 4, three colours R, B, Y, unequally

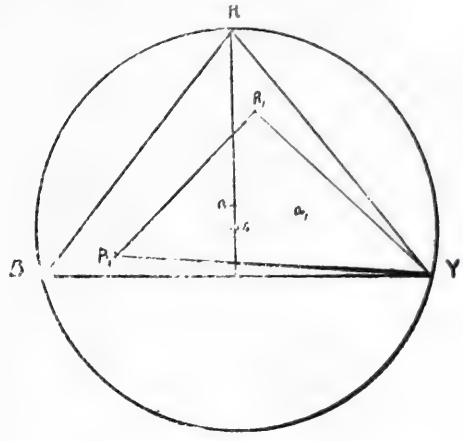


FIG. 4

distant are chosen the centre of gravity of the triangle A will no coincide with the centre of the colour circle S, and instead of black a reddish-brown will be formed, and if a black or grey is to be formed the proportions must be $1B+1Y+\frac{4}{7}R$, and in this case, if black is formed the red is wanting elsewhere. In the case, of yellow, madder, and Paris blue, as shown in the inner triangle R, B, Y, the centre lies nearer yellow A, and yellowish brown is formed instead of black.

There are, therefore, two systems of colours for trichromatic printing, (a) theoretically correct trichrome system, yellow, crimson, and blue green, to which the printing inks cadmium or bright chrome yellow, nachtrosa, and peacock blue, and viridine lake answer; and (b) the stable colour system represented by chrome yellow, madder lake, and Paris blue.

Hübl now goes on to say, "The opinion has been frequently expressed that the fundamental colours used must as far as possible reflect rays of only one region. The striving after such 'pure' colours is entirely wrong, they would possess very broad absorption bands and be quite useless for mixtures; at the most they would only be useful for trichromatic printing with half-tone blocks, assuming that the originals possessed a light and less saturated coloration.'

For four-colour printing the fundamental colours must also be chosen as far from one another as possible on the periphery of the circle, and as all the compound colours enclosed by a square will include almost the whole area of the colour circle, the requirements as to purity of the colours are not so stringent, and the stable colours chrome yellow, madder lake, and a blue and green lake will be quite suitable.

Finally as regards the choice of colours for the pictures for the photo-chromoscope and polychrome projection, Hübl points out that here the pictures are formed by the admixture of coloured lights, and therefore the fundamental system of colours must be chosen from a suitable colour chart which differs from that previously mentioned in that the centre must be white.

The fundamental colours must, however, be again separated by 120°, and there are therefore here also innumerable correct colour systems which may be chosen, but that, if the yellow, crimson, and blue-green accepted for printing be taken, a less saturated and whitish blue will be formed as the compound colour; and, as blue is specifically the darkest colour, this must be chosen as a fundamental colour, and the other colours must therefore be red and green, and, according to the blue chosen, the fundamental colours may be ultramarine spectrum-red, and yellowish-green, or violet-blue, reddish-orange, and pure green, and "these are the combinations which have been chosen by Ives, Vidal, and others for the work in question."

E. J. WALL.

CLOUDS AND CLOUD NEGATIVES.

[Lecture delivered before the South Manchester Photographic Society on Monday, April 1, 1901.]

"THE sky is the crown and glory of the landscape; it is capable of all varieties of expression, from the smiling cirrus to the inky frown of the storm-cloud; nothing in nature is more conducive to pictorial effect; nothing so helpful for saving a picture that has not quite enough in itself; nothing so easy to photograph, and yet we not only do not give it the attention it deserves, but treat it with indifference and neglect." So wrote that grand old photographer, the late H. P. Robinson. There are few land or seascapes taken that would not be improved by the addition of clouds—in fact, in very many cases an otherwise indifferent foreground may be made into a picture by the judicious use of clouds from another negative. It must, however, be remembered that clouds that are unsuitable, or are lighted differently to the foreground, are really very much worse than none at all. It is a great mistake to think that the clouds that are present at the time the landscape negative is exposed must of necessity be the best. They may be natural, but so may others be equally natural, and at the same time more pictorial, and give a better harmony of line and tone. So do not run away with the idea that it is always advisable to get the clouds present at the time on the landscape negative. Still, there are times when the clouds and landscape, as seen together, do harmonise most perfectly and are also most pictorial; and when this occurrence does come to pass, they should be secured on one plate, if that be by any means possible. And, fortunately, it very often happens that the clouds that can be so secured do agree with the landscape—such as heavy storm-clouds and some sunset clouds. In nine cases out of ten the clouds, even if they are distinctly visible in a landscape negative, will not print out with the view, as nearly always the sky develops the quicker, and so becomes exceedingly dense. Several methods have been suggested for keeping back the sky during development by local application of restrainers, &c. But these methods are very uncertain, and far more difficult than blocking out the sky and printing the clouds in from a separate negative. Next to the sun itself, sunlit clouds are probably the brightest objects generally met with, and the brilliantly lit edges are often in close touch with comparatively dark shadows. In such cases there is danger of halation and loss of detail in the high lights. This points to the use of backed plates, isochromatic for preference. For sunset and sunrise clouds isochromatic plates are almost essential to do anything like justice to the very beautiful cloudscapes often to be obtained at these times, but, as the light is more or less yellow, it is not necessary to use a yellow screen. Certain few prints, however, are more harmonious without any cloud forms; but a light tint to tone down the glaring white paper is always desirable. This should be graduated from the horizon upwards. I have several times been asked what I mean by suitable clouds, and, in reply, have only been able to say that suitable clouds mean clouds which, in conjunction with a particular view, are such as do not contradict the conditions of lighting or weather depicted in that view. Therefore it follows that clouds to be suitable must accord with the requirements of the foreground as regards perspective, illumination, sunshine, calm, tempest, or rain; and also with the pictorial requirements, in form, depth of printing, size, &c., and combine with the form of the foreground to compose a pleasing and harmonious whole.

T. MORLEY BROOK.

A FEW HINTS ON STORING AND INDEXING NEGATIVES.

I AM afraid most photographers do not take sufficient care of their negatives, considering how important they are. For on them, to a great extent, rests the degree of perfection to which the prints from them may be brought. They are often allowed to lie unprotected by a covering of any sort for weeks in the dust on the workshop table, liable at any moment to be knocked down and smashed, or scratched, by some careless hand. The person may think that a scratched or broken negative could easily be retouched or repaired; but I can assure them that it will all take time, and then I doubt that it can be effectively done, so that no marks whatever show.

A gelatine negative is not one of the most robust articles, and it should, therefore, be protected as much as possible, not only on account of the fragility of the glass basis, but the gelatine itself ought to be shielded from the peculiarities of our changeable climate. Many a valuable one is ruined by silver stains, caused through printing from it in a damp atmosphere. When obliged to print in the open during the damp winter months, when that process takes a considerable ti it is well to cover the frames over with a piece of glass slightly la than the frame itself. This will effectively keep the moisture f getting between the glass of the negative and the frame. It is always wise to lay the printing-frame on the bare ground, as I h seen many photographers do, for if the frame is of a different t perature to the ground it will draw the moisture out of it. To a this, lay the frames when printing on a well-seasoned board. D printing-paper is another fruitful source of silver stains. The place to keep gelatino-chloride and bromide papers is in metal bo which should be kept in a dry, but not warm, cupboard. If the board is too hot it will cause the gelatine surface of the forme become brittle and crack. The bromide paper is very susceptible damp, and soon goes bad if not kept in a dry place, but when damp state it does not stain the negatives so much as the gela papers.

Before using, dry the linen pad of the printing-frame before fire, and place a sheet of bone-dry blotting-paper (photographic) tween it and the printing-paper. All this may seem very faddy, bu is astonishing the amount of steam that will come out of a pad has been kept in what appears to be a dry room. No one would think of sleeping in a bed the sheets of which were not aired. vention is better than cure, for a valuable negative may easily ruined by a slight stain, and it requires an expert to remove a s stain thoroughly without damaging the film.

No doubt to preserve a negative from the effects of heat and da there is nothing like varnishing it. This is a lot too much trou for most photographers, but it is surprising how easily it is d after a little practice. Before varnishing, even if a cold varnish i be used, it will be well to warm the film side before the fire to rem any moisture that may remain in it. Of course, when a cold varnis used, the negative must be allowed to cool before applying. essential that all dust should be cleaned from the surface of the f or when the varnish is applied bubbles will result.

These are the days of cheap printing-frames, many of which made from unseasoned wood, and hail from across the herring p There is nothing, I believe, yet invented that will beat the good fashioned solid box printing-frames. It is true they are lumber but negatives cracked in the printing-frame were unknown when t were in use, but the photographer, like every one else, must st economy, and keep up with the times. Some of the cheap frames all right, but I advise every one who uses them to place a piece glass in front of the negative—plate-glass if the well of the frame allow of it, or he may find to his cost that it has warped and crac his best negative. The plates are not always cut with a clean e and this will sometimes cause a negative to crack in the frame. avoid this as much as possible, I bend the edges of my negatives ro with lantern-slide binding strips. It gives a pleasing white ma to the print, and adds considerably to the stability of the negativ

I have noticed several photographers placing their frames on window-sill to print—this I consider a dangerous practice, for any lifting the window up may cause them to slide off and break the n tives. Amateurs are the greatest offenders in this respect; they p their frames in all manner of dangerous places, and will not learn t more careful till experience dearly teaches them.

All negatives ought to be numbered, and an index of them k If this is properly done it will save endless trouble and temper having to hunt through all your stock to find out any particular They should be kept in envelopes, sold especially for the pur then one can be sure that they contain no chemical that will b jurious to the film. The envelope is best numbered on the flap, it can easily be seen without bodily moving the negative. The n tive must also be numbered the same as the envelope, or it ma placed in the wrong one. A packing-case, with a little trouble, be made into an excellent negative cabinet by placing partitions i in the form of "pigeon-holes," as used in offices. Use screws, not nails, when fastening the partitions in, as the former are n stable, and do not split the wood like the latter. When varni over with mahogany-stain varnish it has quite a pleasing appeara and is a useful addition to the workshop furniture (see fig. 1). "pigeon-hole" should be kept for each class of negatives, which considerably help in finding a negative at once. They need not all the same size, as, for instance, larger spaces will, no doubt required for portraits and landscapes than for any other classes. course, the size of the packing-case will depend upon the amoun negatives the photographer possesses. The cases can be obtaine almost any size from wholesale warehouses. A good plan is to l the "pigeon-holes" with a letter for each class, such as (a) portr (b) landcapes, (c) groups, (d) architecture (interior), (e) architec (exterior), (f) animal and flower studies, (g) instantaneous work, miscellaneous (negatives that will not come under the heading of other classes).

Now a word as to the placing of the negatives in these "pig holes." Never place one negative on the top of another, as pressure of the topmost will often cause those underneath to cr The proper way is to place them in side by side on their edge

similar manner to that of books on a shelf), so that the flap of the envelope projects towards you. Each negatives can then easily be taken out as required, and the number of it can be seen without moving any of them.

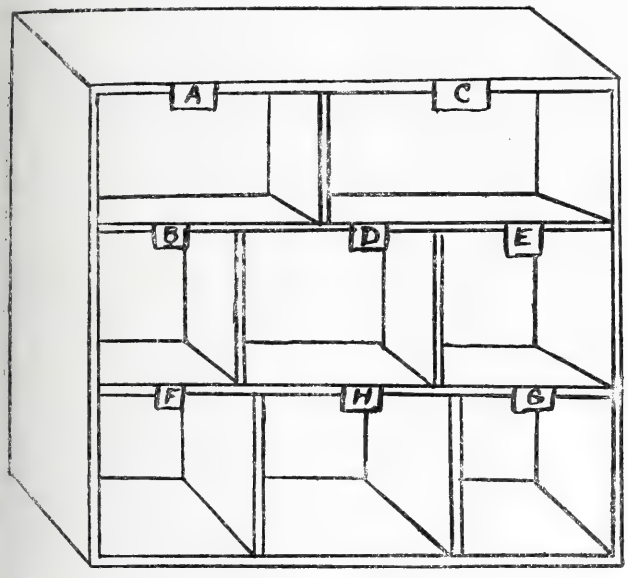


Fig. 1.

A splendid index-book for negatives can be made from a ledger or day-book; either of them can be purchased at most stationers' for bout sixpence or one shilling. No notice need be taken of the olumns ruled in them in faint lines. I myself use a ledger, the ages of which I have divided out into six columns each. Thus I ave twelve columns for the description of a negative—six on the left-and page and six on the right. All these are not necessary, but I ke to keep an index, and a record of the negative at the same time, s it is useful for reference and educational purposes.

For those who require an index only, two columns will be sufficient, ne for the number of negative and the other for the subject.

EXAMPLE (left-hand page).

Number and class,	Subject.	Light.	Time of Day.	Date.	Lens.

EXAMPLE (right-hand page).

Stop.	Make of Plate.	Exposure.	Developer.	Further Treatment.	Remarks.

The columns must not be all the same size. For instance, small nes only will be required for the number, stop, date, time, lens, and rger for subject, &c. To facilitate the finding of a negative quickly, ch class should be indexed separately, and several pages allowed er for negatives to be added from time to time. At the commence-ent of each class a slip of paper, with the representative letter of at class printed on it, may be pasted on the edge of the first page, that it projects outward. If all the classes are done in this way e book can be opened at any desired class instantly. All this may em very complicated, and a lot of trouble to take over a negative, t it will well repay the photographer who tries it, in the time it will ve him afterwards.

OSBORN THORNBERY.

Studio Gossip.

THE Penalty of Greatness.—A Scarborough lady has received from her son, who is a naval lieutenant attached to one of the ships of the Mediterranean Squadron, a graphic account of the reception at Malta of the Duke and Duchess. The correspondent says that he was at Malta when their Royal Highnesses arrived. He pitied them very much, for every one was staring hard, and no sooner had the Duchess taken her seat than a great camera was planted down a few feet off her face to snap her.

SHORTLY after Gainsborough's famous "Duchess" was stolen, says the "Daily Chronicle," a journalist was invited to attend a spiritualistic séance in North London. For some time he listened, incredulous. Then he sent a request to the effect that the spirit of the lady who had sat for the purloined portrait should be summoned, and examined as to its whereabouts. This was duly done, and a series of knocks indicated her arrival. Now, it happened that the medium had but a vague idea of the period in which the artist had lived. The journalist, noting this, said, "Ask the Duchess if she remembers sitting for the photograph at Gainsborough." The medium put the question, and the spirit answered "Yes!" The séance ended. "Solvuntur risu tabulæ."

CINEMATOGRAPH for the Blind in France.—According to a contemporary, Dr. Dussaud, of the Psychological Institute of Paris, recently gave a lecture at the Hospital des Sociétés Savantes, on the education of the blind and deaf. A large audience witnessed interesting experiments founded on his method for supplementing the senses of these two classes of unfortunates. The cinematograph for the blind is a machine which passes under the fingers of the blind a series of reliefs representing the same object in different positions—the branch of a tree, a bird, or any other object. The blind person has the illusion of moving scenes just as photographs passing over a luminous screen lend the illusion to those with sight. Dr. Dussaud has also arranged an electric vibration for the use of the deaf who are incurable. This gives them the notion of musical rhythm. For those not entirely deaf, he has invented a "gradual amplifier of sounds," which supplements the organs of hearing and in some instances improves them. Dr. Dussaud expressed the hope that these two inventions would materially aid in the education of the deaf and blind. The doctor gave a number of statistics already furnished by him to the Academy of Medicine and the Society of Biology, showing that his method had been applied during the last four years to more than three hundred patients affected either with blindness or deafness, and that in most cases the results obtained had been extremely satisfactory.

News and Notes.

WE are sorry to learn of the death of Mr. Ashley Cowan, the only son of Mr. Alexander Cowan. The deceased gentleman, who had long occupied a responsible position at Messrs. Marion's Southgate Works, was about thirty-seven years of age, and passed away with great suddenness last week. The sympathy of our readers, we are sure, will be extended to Mr. Cowan, sen., and the other members of the family in their severe loss.

ROYAL Photographic Society.—Ordinary Meeting, Tuesday, April 16, at 66, Russell-square, at 8 p.m. Mr. Charles L. A. Brasseur, of New York, will read a paper upon "The Sampolo-Brasseur process of indirect colour photography—one negative, three printings." The exhibition of Colonel J. Gale's photographs now on view at 66, Russell-square, from 10 to 4 (Wednesdays 10 to 8), on presentation of visiting card, will remain open until Saturday, April 20.

AT the last meeting of the National Photographic Record Association—Sir Benjamin Stone, M.P., in the chair—one hundred and one prints were received from Mr. G. Bingley, Leeds, and a selection of views of old London, from the Duke of Bedford, J. W. Marchant, and E. Scamell. The total number of prints received and promised now amounts to about 2000. The value of the photographic survey work has now been generally recognised, and societies have been started in Switzerland, Belgium, and Sweden.

DR. George G. Hopkins, of Brooklyn, has, says a contemporary, been using decomposed light in the treatment of consumption with considerable success. Dr. Hopkins' system is to use decomposed light as a substitute for sun rays. The patient is fed with arsenic, cod liver oil, &c., in order to build up the system and strengthen the tissues. Then the light, which restores vitality, is used and the patient is enabled to throw off the germs of consumption. The system originated with Dr. Finson, of Copenhagen. It has also been used for the treatment of cancer. A 15,000-candle power arc light is used and the light is decomposed by blue glass, thus allowing only certain of the rays to strike the patient.

Commercial & Legal Intelligence.

MESSRS. F. H. Taylor and Sons, Medical and Photographic Glass Merchants, have removed to No. 1 Wharf, New Wharf-road, King's Cross, London, N.

The prize of a folding camera awarded for the best negative on Thornton films has been won by E. J. Robinson (aged twelve years), of Poulton-le-Fylde. The cash prizes for the best prints on Thornton papers have been awarded as follows:—First prize, Mr. Isaacs, of Clifton, Bristol; second prize, Mr. F. Sharp, of Heaton-park, Manchester; third prize, Mr. F. J. Matthews, of Chelmsford, Essex.

Mr. F. S. Horsey, of 1 and 2, Queen-street, Cheapside, writes: "I beg to inform you that I have purchased the business of the late Mr. A. A. Wood, at the above address. The transfer was effected on the 11th ult. The business is undergoing careful revision, and is being placed on a thorough commercial basis, and we trust that those of our friends who have had dealings with us in the past will appreciate the additional facilities we intend to place at their disposal. The name of the firm will remain as heretofore."

Photo Limited.—In the Chancery Division of the High Court on Tuesday last week, before Mr. Justice Joyce, Mr. James moved on behalf of a debenture holder in the above-named company for the appointment of a receiver and manager. Mr. James stated that his client had received that morning a letter from the liquidator stating that the company had gone into voluntary liquidation. The company dealt in photographic materials, and his client wished a manager to be appointed to continue the business. The application was granted.

Messrs. Newton and Co., of 3, Fleet-street, have made an arrangement with Messrs. W. and D. Downey, of 61, Ebury-street, Eaton-square, by which they obtain the sole right to publish as lantern slides the principal copyright photographs of that celebrated firm. These pictures which have never been allowed to be sold as slides before, comprise the new photograph of His Majesty the King, and Her Majesty Queen Alexandra, taken the other day by special command, which will be published on April 15, as paper photographs by Messrs. W. and D. Downey, and on the same day as lantern slides by Messrs. Newton and Co.; a series of royal photographs taken during many years by Messrs. Downey, and their well-known art studies. In addition there will be a fine series from the "Sign of the Cross."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
15	Bradford Photo. Society	Members' Slides.
15	Glasgow and West of Scotland	*Photographic Chemistry.* George Watson, B.A.
15	Walthamstow Photo. Society	Demonstration: *Photographic Tabloids.* W. H. Judson.
16	Birmingham Photo. Society	*Composition.* C. T. Cox.
16	Croydon Microscopical	*Pagan Survivals in Modern Britain.* A. C. Haddon, M.A., B.Sc.
16	Leicester Literary	Prize Lantern Slides.—*The Aphengescope.* F. R. Rowley, F.R.M.S.
16	Rotherham	Demonstration: *Velox Printing.* Donald A. Nightingale.
17	Borough Polytechnic	Lantern Night.
17	G.E.R. Mechanics Institution	*Elementary Pictorial Work.* Mr. Bennett.
17	Redhill and District	Lantern Slides.
17	Southport	*Colour Photography.* Henry Ball.
17	Woodford	*Figures in Landscape.* J. P. W. Goodwin.
18	Camera Club	*Man's Place in Nature.* Percy Ames.
18	Leigh	*Some Typical Subjects and their Treatment.* A. Horsley Hinton.
18	London and Provincial	Lantern Night.
18	Manchester Amateur	*Copying from Books.* F. W. Parrott.
18	Röntgen Society	Discussion: *X-ray Therapeutics.* Opened by Miss M. M. Sharpe, L.R.C.P.
19	Aberdeen	Business Meeting.
19	Croydon Microscopical	Photographic Chat.
20	Borough Polytechnic	Excursion: Hampstead Heath. Leader, H. A. Norman.

ROYAL PHOTOGRAPHIC SOCIETY.

Lantern Meeting, April 2,—Mr. J. J. Vezey, F.R.M.S., in the chair.

Mr. Charles Reid, of Wishaw, N.B., gave a most interesting lecture or chat upon

Animals and Birds in their Native Haunts.

A large audience again being present, drawn together largely by Mr. Reid's well-known reputation as an animal photographer, and by the fact that it was the last lantern lecture during the present winter session. Most of Mr. Reid's photographs were taken north of the Tweed, but, on the other hand, there were a good many taken in England, notably in the series that illustrates the different methods of ploughing in vogue in the various parts of these islands. Agricultural pursuits formed the subject of a large number of pictures, the not very common sight of oxen ploughing being included. Various methods of sowing, reaping, and binding adopted in different counties and districts were exemplified, forming an attractive feature of the display. Mr. Reid brings to bear upon his work a very intimate knowledge, sympathy, and love of the dumb creatures, and one can well understand that he has very little trouble in getting his subjects to assume the charming attitudes depicted in most of his pictures. His bird series deserves particular attention, including as it does some fine representations of all our common birds. We would mention the picture of the blackbird on nest, which seems to exhibit not the slightest fear of anything harmful from the near presence of the photographer and his camera. In addition to the wild birds of the country-side, there were the inhabitants of the farmyard—the ducks and geese, the various breeds of fowls, silver Wyandotes, Brahmas, &c. The cattle and sheep in the wild and rugged highlands of Scotland formed most picturesque groups, the scenery itself adding largely to the beauty of the pictures. Dogs of all sorts were shown, and many interesting anecdotes were given. Very quaint was the little Shetland pony standing by the side of a sheep which, in point of size, certainly had the advantage. A colony of Beavers was the subject of a number of slides, which showed them at work on their dams, cutting trees, &c. At the end of his interesting lecture Mr. Reid made a very earnest plea against the wanton destruction of animals which were being exterminated, he thought, quite fast enough by the march of civilisation.

Croydon Camera Club.—The Annual Easter outing was held on Good Friday, when a party of members, numbering thirty-eight, in charge of the President, travelled down to Horsham in a special saloon carriage. After a slight "refresher" the party drove to Leonardslee, where Sir Edmund Giles Loder, Bart., kindly gave them the run of his delightful preserves, in which are acclimatised a very remarkable and striking assemblage of exotic animals and plants. Of the latter there were growing, quite without protection in the open, cacti, palms, some of the latter being quite twenty feet high, innumerable clumps of bamboo, and scores of the curious "pitcher" plants, with many more of similar strangeness to English gardens. Perhaps nothing was more beautiful and noteworthy than a magnificent camellia bush, which must have been twenty years established, this planted out on a lawn was almost covered with brilliant carmine flowers, in bloom and in bud. As for the animals, they seemed to revel in their liberty, and to be quite at home in our land of many climates. It was a long tramp round the lakes and park which the party went in for. First to attract great attention was the beaver pool. Here many were asked by one, "Have you photographed the dam?" "Yes." "May you not have later on to d—— the photograph." Strange wild fowl kept well out of range. A magnificent Asiatic deer plunged into the lake and swam across. Presently we came on a company of kangaroos, one having a little offspring being held in the pouch. These were, of course, much aimed at, several highly respectable middle-aged gentlemen, attired for the occasion in faultless new suits, were so carried away as to lie down and thus drag themselves through wet clay and bog land. Truly sweet are the uses of photography. There was a charming herd of exotic deer which, when driven, and the two-score snap-shooters did not give them much rest, not only ran with a swiftness which probably put all shutters to shame, but had a trick of skipping every fifteen or twenty yards some eight feet up into the air. The effect of a score of them rushing and jumping was singularly attractive. A museum of splendid monster trophies and a fascinating Alpine garden, added to much pleasant talk with which Sir Edmund favoured the party, these and many other items of moment must be passed by because Leonardslee was only half the loaf; the other half being Warnham Court. This belongs to Mr. C. J. Lucas—one of the well-known Lucas eleven famed in the annals of cricket. Some of the party were prepared for an anti-climax after the wonderful things seen at Leonardslee. Far was this from being the case, for not only were they charmed with Mr. Lucas' kind and thoughtful personal attention and much appreciated explanations of many of the objects of interest at Warnford Court but although there was so much to see calculated to gratify the beholders, the gardens and the views therefrom in themselves afforded the greatest of pleasure; and then the plant houses ablaze with amaryllis, orchids, and coloured arums, not to speak of the remarkable miniature trees from Japan. These included an old but perfect oak tree some eighteen inches high, and others of like proportions. Perhaps the keenest delight was felt when Mr. Lucas showed us through his reception rooms, which contained a grand store of curios and objects of art. Old Sussex iron work was much appreciated, and the uses of the various strange objects explained. The pictures, mainly by masters of the British school, came in for great praise. At the end of a long day, so rich in rarities seen and photographed, the general feeling expressed was that the owners of these two splendid collections were, both of them, worthy of their good fortune, and both had laid the party under a great debt of gratitude. After the customary spread at the Station Hotel, Horsham, at the instigation of Mr. Hicks the party awarded, by hearty acclamation, their thanks to the President (Mr. Hector Maclean), for having arranged such a brilliant outing.

Bath Photographic Society.—At the last ordinary meeting the chairman said the ordinary business would be dispensed with, on account of a rather full lecture, which Mr. Luke H. Woods, English Lecturer to Belgian Government Railways, had that day come from Lincoln to deliver before the Society, the title being "Belgium: What it is—How to see it—How to get there." By means of upwards of a hundred lantern slides and a lucid description of these illustrations, the audience were entertained with ample information to enable any present to profitably and economically enjoy a few days' holiday in the most interesting portions of the Belgian Kingdom. Starting from Dover pier and arriving at Ostend, everything of interest to an English tourist was plainly stated, and the best course to take in going from place to place during the stay in the country. The unique system of railway communication was explained, and the following towns separately dealt with: Ostend, Heyst, Brakenberge, Bruges, Ghent, Antwerp, Brussels, Malines, Waterloo, Liege, Louvain, Spa, Chaud

ntein, Dinant, Namur, and the Belgian Ardennes. At the close of e lecture Dr. Adcock, who took the chair during the lecture, thanked r. Luke H. Woods for the able manner in which he had depicted d dwelt upon the many places introduced. He felt tempted to put e programme to the test for he could not conceive a more pleasurable liday of a fortnight's duration.

Patent News.

IE following applications for Patents were made between March 25 and arch 30, 1901:—

INS.—No. 6194. "An Improved Fluid Cell Lens for Photographic Use." EDWARD FERDINAND GRÜN.

IOTOCHROMO-STEREOSCOPES.—No. 6200. "Improvements in and relating to Photochromo-stereoscopes." THOMAS KNIGHT BARNARD.

STALLO-PHOTOGRAPHY.—No. 6246. "Process for the Application of Metallic Coating to Plates and any desired Material, framed or otherwise, for the Permanent Fixation of Photographs." Complete specification. CARL PETER HERMANN AHRLE and the "METALLINE-PLATTEN-GESELLSCHAFT M. B. H."

IOTO-ZINCOGRAPHY.—No. 6307. "A Process of Direct Photo-zincography." Complete specification. FREDERICK REGINALD VANDYKE.

INTING PAPERS.—No. 6609. "Improvements in or relating to the Manufacture of Photographic Printing Papers and the like." MAURICE BERGÉS.

Correspondence.

* *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

* *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—The truism, "Unity is Strength," has always seemed have been treated as a falsehood by professional photographers as class, and the selfish maxim, "Every man for himself," &c., embraced a soothing balm for their guilty consciences. Petty professional alousy is undoubtedly at the root of the whole matter.

Have you ever heard two professional neighbours greet each other ith even a friendly "How d'do?" I never have—much less exchange otes on the business prospects of the season. No; on the contrary, y man who dares to take photographs as a means of providing the cessaries within gun-shot distance of their respective studios is oked upon as an enemy, and treated as such. Why should this be? ecause the first essentials of friendship and brotherliness have been glected, viz., association. We don't understand each other. We ve no interests in common one with the other; therefore, instead fraternal respect, there is a vile prejudice that is akin to hatred. ow I, for one, have longed for a change in this respect, and I am nscious of the fact that I have tried to do my part in creating a tter feeling, though with feeble results, and therefore I greet the ospect of the inauguration of a National Association of Professional notographers as a step in the right direction, and personally thank u for the efforts you are making to bring about a much-to-be-desired ity and subsequent co-operation, by which means alone the real emies of the profession can be overcome.

Re the contemptible, not to say vampirish, business which, by eans of Smoke and Bubble has awakened the profession from its mbers, I may remind you that such a demoralising means of feedg the fatted calf, at the risk of starving the lambs, could not ist in Germany—then why in Britain?

What a dangerous thing is liberty to a man who, in order to further s own selfish interests, will slay the innocent in cold blood. As a dy of workers we must energetically support any movement that ill tend to bring about the establishment of laws that will for ever op such disreputable practices. The new Copyright Act will not it! It will simply affect the welfare of the "classes," while the bread and cheese" votary of the art is still unprotected and helpless. I shall be pleased to support, by becoming an active member, any sociation that will be national in its constitution, which alone can ad to a better condition of things.—I am, yours, &c.,

HENRY J. COMLEY.

The Studio, Wimborne, Dorset, April 3, 1901.

To the EDITORS.

GENTLEMEN,—I shall be very pleased to add my name to the Assoation.—I am, yours, &c., JAMES GRAY.

Old Cross Studio, Hamilton, April 2, 1901.

To the EDITORS.

GENTLEMEN,—The outlook of professional photographers is not one to be envied by other professions, and the seriousness of the situation calls for a Bill in Parliament to give professional photographers an absolute copyright in all their productions. I think it only right that the work of photographers, the outcome of many years' study, &c., should be protected to the utmost. If such a Bill became law it would be practically impossible for the wily and artful schemers that we are hearing so much about just now to do a just and honourable profession the harm that is seemingly inevitable to it.—I am, yours, &c.,

April 1, 1901. E. J. H.

To the EDITORS.

GENTLEMEN,—Notwithstanding somewhat discouraging experiences of my former connexions with professional associations—as an original member of the late N.A.P.P., and later of the Glasgow Professional Photographers' Association—I shall be pleased to enrol myself a member of our new organization, which, at last, seems to command a support wide enough to secure for it a power to act with some effect for the benefit of professionals, whose greatest necessity is united effort to free themselves of the parasites which cling to them in ever-increasing numbers. Could we but secure a modified or restricted copyright in every photograph taken for a consideration (except in cases taken by special agreement for publication or reproduction otherwise), we would at one stroke free ourselves from the free portrait swindle, the cheap enlarger, the pirate publisher, and last, but not least, the "Tuppence-ha'penny" bromide man who now uses the tallow-boiler and the "Three-smokes-a-penny Company" to provide a market for his bromide paper. By the way, gentlemen, I'd like to get a hint of the identity of this precious manufacturer of bromide paper, in order to satisfy myself that I'm not using any of his productions. I may add, however, that I see no reason for excluding amateurs from such an Association. A Photographers' Defence Association would be all the stronger, and all the more influential if, through the various societies the greater bulk of photographers could be got to act solidly for the benefit of all. There are so few absolute amateurs, that I look upon the bulk of them as fellow-professionals—whose interests as photographers are identical with my own—except as regards the solitary and inevitable item of personal competition, which I look upon somewhat philosophically.—I am, yours, &c., R. C. PLATT.

Airdrie, March 30, 1901.

To the EDITORS.

GENTLEMEN,—Would you kindly hand my name to the Secretary of the Professional Photographers' Association for admission as a member of same? I would have sent in my name before this, but fully intended to be at your meeting in Fleet-street, and was only prevented through sudden illness. I have read the whole of your remarks, and am quite at one with you, with one exception, and that is where you mention that the Association might protect photographers who deal a little in chemicals. I don't think it should interfere with this, but rather discourage such dealings. Don't you think that the photographer who does so is just another Smoke and Bubbles? What would we think of some of our professional dealers if they hang a case of specimen portraits at their door, have a saloon at the back, as most of them have, with a staff of qualified assistants prepared to take your photograph, or sell you a Kodak or a pound of hypo? No; let those who have taken up photography as a profession stick to it, push it as hard as they can, mind their own business, and leave other people's business alone.—I am, yours, &c., J. COOK.

32, High-street, Paisley, April 6, 1901.

To the EDITORS.

GENTLEMEN,—I shall be greatly obliged if you will kindly add my name to what, I hope, will be a very long list of members of the Professional Photographers' Association.—I am, yours, &c.,

91, Durham-street, Hartlepool, April 6, 1901. T. COWLEY.

To the EDITORS.

GENTLEMEN,—We are pleased to send you two more names from this district of those in favour of this scheme, viz., Charles Mitchell, of Greenock and Glasgow, and Geo. A. Brown, Greenock. This leaves only one now (which we hope to get soon) to make Greenock unanimous. Long life to the Association.—We are, yours, &c.,

Greenock, April 8, 1901. JOHN PRATT AND CO.

To the EDITORS.

GENTLEMEN,—It was with great interest I read the account of the meeting to form an "Association of Professional Photographers," and certainly it points to success if only photographers will enter heart and soul into it. No half-heartedness will carry it through. it behoves every one of us—employer or employee—to stand together

and work for the interest of a profession that is at once remunerative, useful, and beautiful, if carried on on proper lines. We must strike, and strike hard at low prices and touting, to enable us to bring the profession up to what it ought to be, and deserves to be—to use an old-time proverb, "We must make hay while the sun shines," and the more rakes (not the human sort) we have the better. I want particularly to write a few words for assistants; it was suggested that they should be kept out, this is hardly fair to them, as there are undoubtedly clever men who would like to join the movement, more especially as a large number of employers depend upon skilled assistants to turn out their work, and how about those who hold responsible positions, managers and assistants who have numbers of younger members of the works under them, it would be far better for us employers and employees to be united to make the Association as strong in numbers and brains as possible. Unfortunately there are assistants who do not deserve to belong to such an Association of this sort—careless duffers some of them—could it not be arranged that an employee should be recommended by his employer, or by a reference, that should be witnessed by the secretary of his district when branches are formed? Some arrangement of this sort would be quite feasible, instead of shutting the door in the face of those upon whose skill and energy professionals are in a great measure dependent. I should be glad if you could make room for this, for other assistants to read, that they may make some effort for our mutual improvement, and thereby employers would also benefit by bringing together high-class assistants.—I am, yours, &c., H. J. Hewitt.

16, Oxford-grove, Ducie-grove, Manchester.

To the Editors.

Gentlemen,—Please add my name to what I consider is the most sensible cause ever been put forward for photographers. Wishing it every success. Thanking you for your interest in same.—I am, yours, &c., G. B. Bradshaw.

High Bank Studio, Church-street, Altrincham, Cheshire,
April 9, 1901.

To the Editors.

Gentlemen,—I have read with pleasure the report of the speech made by Mr. Thomas Bedding on the evening of March 28. I agree with him in all points, and sincerely hope that, for the good of the photographic profession, every respectable photographer in Great Britain and Ireland will himself join and use his influence to induce other professionals to join the national and local associations, which is intended to benefit, and will benefit, all connected with photography.—I am, yours, &c., G. W. Morgan.

393, Union-street, Aberdeen, April 6, 1901.

THE PHOTOGRAPHIC SALON, 1901.

To the Editors.

Gentlemen,—I shall be obliged if you will kindly allow me space in your columns to state that the Ninth Exhibition of the Photographic Salon will be held at the Dudley Gallery, Piccadilly, from the 20th of September to the 2nd November next. Intending exhibitors who may be going abroad can receive advance copies of the entry form by application to me at the Camera Club, Charing Cross-road, W.C.—I am, yours, &c., Reginald Craigie.

April 9, 1901.

THE EDUCATION OF PHOTOGRAPHERS.

To the Editors.

Gentlemen,—In your editorial notes a week or so ago you mentioned the want of photographic education displayed by many assistants. The idea that a ten-inch lens would act as a wide-angle one for a whole-plate is about on a par with the information I received from an operator that the largest stops were for use with the largest plates the lens would cover, and the smaller apertures for smaller plates, i.e., *f*-8, say, for 12×10, *f*-32 for quarter-plate, &c.

Now that we have a Photographers' Association, I think that one of its chief purposes should be to establish a system of examinations for photographers, these to be of varying standards, and after the style of the various science and art examinations. For instance, a "preliminary" requiring a general (not too high) knowledge of work, say printing, toning, developing, &c.

A third class, taking fewer subjects, say four, to be chosen by the candidate, and requiring greater knowledge.

A second class, taking only two subjects—retouching and operating, retouching and finishing, printing and operating, &c., and a first-class for only one subject—operating, retouching, finishing, printing (all processes), &c.

Arrangements could be made in every large town for the examinations to be taken at fixed periods. Knowledge would have to be obtained chiefly by the candidates at their various berths, and by reading. The reading of your Journal alone is an education to photographer; but how many assistants read anything but the ad tisements for employment, and works such as H. P. Robinson's practically unknown to the majority.

The technical schools in the principal towns have a photogra class, but very few professional assistants attend, the classes b chiefly composed of amateurs. Much useful work is taught wh could be taken advantage of by learners in our business (or professio the people they are intended for, but not used by.

If this suggestion of examinations were adopted, a photographer quiring help would know pretty well the kind of assistant he wo be getting by the exams. passed, and thereby save both time and appointment to himself and others. The real reason of the low st of knowledge is, I think, in the fact that so many people are dr from other businesses as clever amateurs (?) taking situations as p fessionals, and not having gone through the trade of photography.

I do not wish to insinuate from the above that all assistants unqualified; on the contrary, I know many very competent men, one does not hear much of this kind; they can do, and do their du and therefore have little difficulty in obtaining and keeping a be It is the incompetent class who want something to stir them up better themselves, and to show them how ignorant they are of th business.—I am, yours, &c., T. Everitt Innes

108, Wellington-road, Heaton Chapel, April 8, 1901.

HYPO.

To the Editors.

Gentlemen,—"Free Lance's" strictures concerning the "d quescence" of hypo (page 98), are perhaps technically justifiab though the etymology of "deliquesce" favours it occasional use, ev in chemical text-books, as synonymous with "liquefy." And, inde the humidity of the atmosphere may be assumed to be of some i portance if hypo can be dehydrated without appreciable liquefact in a current of dry hot air at temperatures not beyond those wh ordinary thermometers are at times called upon to register. A cor spondent, re the coupon discussion, recently suggested that pho graphers should retaliate by giving presents of soap or cigarettes their clients. Whether anything similar is done in Great Britain. cannot say, but across the Channel one sometimes sees such an a vertisement as this:—"N.B.—A chaque client qui prendra une d zaine grandeur visite (7fr.) ou six albums (8fr. 50), il sera donné com prime une jolie Broche vieil argent ou doublée or."

This is certainly a step in the direction indicated by your cor spondent.—I am, yours, &c., J. Dormer.

Rouen, April 1, 1901.

THE SALE OF POISONS.

To the Editors.

Gentlemen,—May I be allowed to correct an error in last week Journal, as it has been several times repeated. The sale of certa poisons is not restricted to pharmaceutical chemists only. Chemis and druggists are fully qualified for that purpose. The oilman ma of course, be quite as capable of fulfilling the requirements of t Poisons Act as the pharmaceutical chemist is, only he has given proof of his ability, which the chemist has. It is equally proba that he would conduct The British Journal of Photography the satisfaction of all parties. The suggestion that the purchaser p a fancy price to the druggist for an inferior article is not, I think, t general experience. I shall be glad to know where I can buy carbo acid at a few pence a pint. The oilshop article known to the pub as carbolic acid would not know itself under that name. You do n appear to know that the Home Office has been memorialised by juri all over the kingdom for twenty years to place carbolic acid on th poison schedule. Parliament yielded at last to an overwhelmin weight of public opinion.

You may be surprised to hear that the Pharmaceutical Society's la expenses amount to a large sum annually over and above the amou received as fines. The cost of administering the Pharmacy Acts borne entirely by the chemists of the kingdom. The Society has n monopoly in the sale of poisons. It is a body entrusted by the Legi lature to carry out the Pharmacy Acts. It certainly does not se poisons.

You are fond of the expression, "poisons used in photography. Now, a poison does not lose its poisonous properties because it is goin to be used for photographic purposes, neither can it on that accoun cease to conform to the laws of the country.

I have not seen an account of erroneous dispensing at Sheffield i any other paper than The British Journal of Photography, but if correct, it has nothing whatever to do with the question of poisons.

You say it is notorious that pharmaceutical chemists are the greates infringers. This is absolutely untrue. Finally, the man who ha not heard of the Pharmaceutical Society prosecuting one of its own profession is not the proper person to write an article on this subject The object of the Pharmacy Acts is to protect the public agains

rsons such as the writer of the article referred to, who are quite norant of the matter.
Trusting you will be able to find room for these few remarks in your xt issue.—I am, &c., J. OSBORNE.
Wiveliscombe, April 1, 1901.

A NEW LENS.

To the EDITORS.

GENTLEMEN,—I beg to send you specimen photographs taken with y new lens, provisionally protected, working at *f*-1.5 and *f*-.84. ey are an advance in photography hitherto unattained. You will e I can take instantaneous photographs by ordinary gaslight, also n take photographs of stage effects with ordinary stage illumin on instantaneously from the auditorium.—I am, yours, &c.,
E. F. GRÜN, L.R.C.P.Lond., M.R.C.S.
The Hall, Southwick, Brighton, April 7, 1901

[It will be seen by the application included in our Patent News is week, that in the lens referred to by Dr. Grün, the fluid principle s been availed of. By the courtesy of Dr. Grün we have had one of e lenses before us, as well as a number of photographs of stage oups and domestic interiors taken at night with very rapid ex- sures. These prints show that instantaneous work by ordinary ar- icial illumination may be successfully accomplished by the aid of e modified lens above referred to.—EDS. *B. J. P.*]

ELECTRICAL ACTINOMETERS.

To the EDITORS.

GENTLEMEN,—I should esteem it a great favour if you would spare e a few lines to state that since writing the article upon the above, have had placed at my disposal a treatise by H. Riggollot, "Actino- ètres: Electro-Chimiques," a scientific and exhaustive study of the ole subject. From this it appears that Dr. Riggollot, in using es as sensitisers, bathes the plates in a solution of the dye, allows em to dry, and then immerses in the cell. This is rather different om dipping them in a coloured solution of the dye. On testing some ates in this manner I obtained a large increase of the E.M.F. Thus copper-oxide plate giving .0262, on tinting with malachite green ve .0699, whilst erythrosine, under similar conditions, showed an crease from .0349 to .1051. Properly used, therefore, it is evident at dyes do increase the E.M.F. of the plates in a marked degree. r. Riggollot's work is well worth studying before experimenting on e matter, as it deals with the preparation of the plates, the effect the spectrum, and the spectrum rays which have the most marked tion on various dyes. All the phenomena, however, may be ob- rved by the simple apparatus described by me.—I am, yours, &c.,
JOHN A. RANDALL.

KODAK, LIMITED.

To the EDITORS.

GENTLEMEN,—The following resolution was passed by the Man- hester Photographic Society at its meeting held April 3:—"That is meeting of the Manchester Photographic Society believes that e restrictions the Kodak Company are attempting to impose on dealers photographic materials would, if carried out, be highly prejudicial the art of photography by limiting or discouraging improvements or ventions."—I am, yours, &c., Pro C. C. Coote, Secr., J.B.
April 5, 1901.

PHOTOGRAPHY AND THE FOURTH COMMANDMENT.

To the EDITORS.

GENTLEMEN,—Your correspondent, "Six Days a Week," is quite ght in protesting against Sunday labour for photographers' assistants. hey have a right to "a day of rest," which, I have no doubt, they lly earn by their work during the week. But he is unwise to base is argument on the untenable assumption that the observance of the abbath is obligatory on Christians as a religious duty, and I fancy hat any attempt at enforcing wholesale an almost obsolete law would e strongly opposed by many who, while wishing to maintain a salu- ry practice, would not submit to their "Christian liberty" being urtailed in deference to the mistaken views of those who would assert principle for which they cannot produce any Scriptural authority.—
am, yours, &c., J. H. W.
April 5, 1901.

To the EDITORS.

GENTLEMEN,—I was very pleased to see in THE BRITISH JOURNAL F PHOTOGRAPHY, dated April 5, a letter headed "Photography and he Fourth Commandment." I quite agree with your correspondent, and think that Sunday business is a very serious thing to be considered. If I were to write a whole volume I could not express my feeling on the subject more strongly than your correspondent "Six Days a Week" has done for me. I sincerely hope that his letter has been read and duly considered by many, and I should like to ask all those who have not read it to do so. I myself have never yet worked on a Sunday, and I never shall do; but it is for the sake of those who are almost obliged to accept seven-days-a-week engagements to escape being left on the great list of unemployed, that I am writing these few lines. Trusting that this very serious matter will be properly taken up, as it should be, and that I may see more correspondence on the subject next week. Is not this another thing for the future Professional Photographers' Association to consider? Could not they do something to alter this very bad state of affairs?—I am, yours, &c.,
IN EARNEST.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. Paterson, 32, Church-street, Inverness. *Photograph of case of Taxidermy.*
C. Gostellia, 55, Thomas-street, Limerick. *Photograph of part of Jubilee Procession and Pope's Celebration.*

LENS QUERY.—"LANDSCAPE." Your query was answered last week, see page 224.

ADDRESSES WANTED.—J. ADAMS writes: "Will you kindly inform me the names of a few firms who are wholesale picture-frame moulding dealers?"—In reply: Messrs. Frost and Reed; or Messrs Epstein, of Bristol, would probably meet your requirements.

PHOTO-MECHANICAL PROCESSES.—J. R. C. says: "I want to get a general idea of the photo-mechanical processes. Can you tell me where I can get some books dealing with the subject up-to-date?"—In reply: Messrs. Penrose and Co., supply all the books published on the subject. Write to them for a list.

CARBON PRINTING.—W. WARDLE writes: "What is the best work for a novice to get for information on carbon printing?"—In reply: The best, and for a novice the most comprehensive, would be the manual published by the Autotype Company. Messrs. Elliott and Son also issue a very practical pamphlet on the subject.

TONING—LENS.—"ATHOS." We prefer to wash the prints before toning them. There will probably be little difference in the permanence of the prints by the two baths, provided they are perfectly fixed. The drawing shows that the elements of the back combination of the lens are misplaced. The convex side of the meniscus should be next the front lens, and the most convex side of the other next that.

A BOOK QUERY.—J. H. BALDOCK writes: "Can you say whether there is any book published similar to Benedict's 'Chemistry of the Coal Tar Colours? I have inquired about this one for the past six months (last time to-day), and it seems problematical if it will be republished."—For the moment we do not remember any other, in English. Possibly some of our readers may be able to tell our correspondent of another.

HAND CAMERAS.—"CANTAB" writes: "I am desirous of having a hand camera with a full-size finder. Do you consider the reflector or the twin lens the better system for practical general use? The question of cost is not of importance, so that it may be left out of consideration."—In reply: It is very much a matter of taste. The one is as good as the other in practice, provided that the finder is accurately adjusted in register with the dark slides.

QUESTION OF CARRIAGE.—"VELOX" writes: "I had been out operating, and, on my return journey by train, I had to change trains at a junction. I went to the guard's van to get my apparatus and the porter told me to go and get my train and he would bring the things to me. However, he forgot to bring a background (which was labelled), and it went on in the other train, and I was kept without it for a week; and, when it turned up, the railway company wanted to charge for it as lost luggage, and I have refused to pay. Can they make me pay?"—In reply: Probably, if you explain the matter to the railway company they will forego the charge. If they do not, we expect it is but a trivial sum.

DEVELOPING CELLULOID FILMS.—T. BRIDGER asks: "Can you tell me of any way of treating rollable celluloid films, before development, so that they remain flat in the developing dish like some other rollable films?"—In reply: We know of no method of previous treatment that will do what is desired. There are different contrivances for keeping the films under the solution during the operation, but those, we opine, our correspondent is aware of.

SUBDUING LIGHT IN STUDIOS.—S. J. says: "I took over the studio last autumn and was never troubled with the sun on the roof till just now, and I expect it will get worse as the summer advances. Can you tell me of anything I can put on the glass to keep the sun out that can be easily removed again in the autumn, as then as till just now, all the light is wanted?"—In reply: Make a mixture of starch paste and whiting, and with this stipple over the glass to be obscured. It can then be easily removed with a sponge and water when it is no longer required.

STUDIO LIGHTING.—"MAD" writes: "Please say best manual on studio lighting, showing and explaining system of blinds, and where same can be bought, and the price."—In reply: All the following are good works on the subject—"Artistic Light," by Jas. Inglis; "The Studio and what to do in it," by H. P. Robinson; "The Lighting in Photographic Studios," by P. H. Duchochois. The price of the first-named 4s. 6d., the second 2s. 6d., the third 1s. The works can be had through all booksellers, or from Messrs. Dawbarn and Ward, Farringdon-avenue, E.C.

COPYRIGHT.—"AJAX" writes as follows: "Last year I took a cabinet portrait of a gentleman who has just died; he only paid for one copy and ordered no duplicates. I know that the friends will want a number of copies, and, likely, some enlargements, but I fancy they will get the latter elsewhere. Can I make the portrait copyright in order to prevent that, so as to secure the orders for enlargements to myself?"—No, because, as you were paid for taking the picture, you have no copyright whatever in it. The friends are at liberty to get the enlargements produced where they like.

AN ENGAGEMENT QUESTION.—"BOBS" writes: "I have taken a situation in answer to an advertisement, which said, 'One year's engagement to suitable man,' I have been in that situation nearly four months and nothing has been said or signed. What I should like to know is, would such an engagement be considered binding, either side, in a court of justice?"—In reply: It would not if there is no written agreement for the year's services. You are only a weekly, or monthly, servant, as the case may be. Therefore you are liable to be discharged at any time on receiving a proper notice from your employer.

ORTOL.—H. C. writes: "(1) I should be greatly obliged if you would explain why the use of ortol, as a developer for bromide paper, at times gives the fixing bath a pink tinge, and often imparts the same colour to prints. (2) Would the use of an acid fixing-bath cure this? and would the use of such bath endanger the permanence of prints or enlargements?"—In reply: The cause of the discolouration is that the prints were not sufficiently washed after the development. (2) To an extent, yes. (3) We are no advocates of acid fixing-baths. Still, they are largely used, and the results are said not to be less permanent than those fixed in the ordinary bath.

MARKINGS ON PRINTS.—"SQUEEGEE" writes: "I should feel obliged if you could tell me how to avoid the markings upon enclosed collodio-chloride print? They are squeegeed upon a pulp board in the usual way, and I cannot get a gloss without these marks appearing—no enamel, collodion, or gelatine being used."—In reply: The cause of the markings is air imprisoned between the print and the pulp board, upon which it was squeegeed. In the squeegeeing this has been broken up into minute parts. Place the pulp board into the water, seeing that no air-bubbles are adhering to it, and then bring the wet print into contact with it; remove and squeegee together.

GLASS FOR STUDIO.—"GLASS-BLOWER" asks: "Will you inform me which of the enclosed specimens of fluted glass are suitable for studio glazing, or if there is anything better, and where obtainable? I may not use clear glass as there is an objection. I enclose a stamp for return of samples."—In reply: Of the two samples we should prefer the fluted marked "No. 1." But both are unnecessarily thick for the purpose. Fluted glass, half the thickness, would be preferable to either, and such may be had from any of the glass merchants. Such glass will obscure the view quite as well as the thicker, while it will admit more light. The samples have been returned as requested.

ECLIPSE PHOTOGRAPHY.—W. H. writes: "I herewith enclose some photographs of the eclipse of the sun that I took last year, they were put on one side and forgotten until a few days ago, when they were developed with the ordinary pyro-soda, and to my surprise the object is reversed, excepting in the one marked with an X on back. Can you favour me with an explanation of this? I should much like to be able to do something with them as I wanted them for lantern slides."—In reply: The cause of the reversal is very much over-exposure, which has brought about the reversed action of light. In the one where this has not taken place we notice that the sun is obscured by clouds, which have subdued the strong light. The only thing that can be done is to treat the negatives as positives.

LENS QUERY.—M. HENRY writes: "Will you kindly give me information on the following—I am only able to afford one lens. My studio is twenty-five feet long, twelve feet wide, camera twelve by ten. (1) Will a Goerz double anastigmatic lens (series III., rapid and three-quarter inches focus) answer for portraits and out-door work? (2) As the lens covers a seven by nine plate at *f*-7.7, shall I be able to use it for carte-de-visite size? I enclose portrait I have taken with 20s. rectilinear, nearly a quarter-plate with *f*-16. Do you mind telling me if I could get as good results on small plate carte-de-visite and cabinet with lens I mentioned?"—In reply: (1) Yes, but it will be slower in action than a portrait lens. (2) It will be too long in focus to take a full-length carte-de-visite portrait in a studio twenty-five feet long. (3) Yes.

PHOTOGRAPHIC HOLIDAY.—J. A. A. writes: "Will you kindly give me some suggestions for a photographic holiday in England? I do not care to trouble you, only I am an utter stranger to the south of England and have no idea where to go. I should like to go south of the Thames, and I propose to spend a week. The class of things I want are picturesque villages, houses, churches, &c. I believe that Kent, Surrey, and Sussex are good fields, and I should like to get the names of some particular places (not necessarily in the three counties), with a good centre to work from, as I do not want to go on tour."—In reply: Each of the three counties mentioned abounds with food for the camera. Plenty of subjects, such as you desire, will be found in the neighbourhood of Chislehurst and the Crays, which are near London. We should recommend you to postpone your holiday till a little later on, when there will be a little foliage on the trees which will enhance the scenes wonderfully. In either of the three counties there are several weeks' work with the camera.

STUDIO-BUILDING.—"STUDIO" writes: "Will you give me your opinion on the enclosed plan? I purpose building a studio, and the only position I have available is on the lead flat, about 18 by 6 by 10 feet, and faces south-west, or nearly so. As the opposite side, which faces about north-east, is blocked by adjoining property, as shown in plan (end elevation), I cannot get a side light there. Is there any advantage in my glazing that side of roof, as well as that shown in front elevation, or any other arrangements you think to advantage in the glazing? The camera must be at the east end, and, therefore, I purpose placing sitter at the other end—is that the better? I could use both ends. I am thinking about using a 12 by 10 field camera, but will you say what focal length lens I should get (portrait) for a studio of these dimensions—say for full-length figures and groups of about twelve or fourteen, also size of backgrounds? If I am to work with south light would you recommend something permanent stuck on glass, or work different shades of blinds?"—In reply: From the aspect, the studio will not be one of the easiest to work, and we should recommend that it be glazed with ground glass. From the drawings we should say there will be no practical advantage in glazing the north side. As both ends of the studio can be used, we should say avail yourself of the opportunity of doing so, as occasion may require. With regard to the lens for so short a studio, the only thing we can say is to have one of about nine inches focus, which will require a distance of about thirteen feet between sitter and camera for a full-length figure cabinet size. But that will not include a group of twelve or fourteen persons in so short a studio. As you desire to take groups better have the backgrounds as large as the studio will permit.

ENLARGING QUERIES.—"ARC LIGHT" writes: "I should be glad if you would answer me a few questions in your Answers to Correspondents column, upon the subject of enlarging by electric light. I had, firstly, better tell you what I have in my mind on the subject. I have recently seen some very compact little ½-h.p. engines with dynamos, the output of which is 300 volts. The dynamo is said to work satisfactorily one arc lamp of six amps. I am at present working a whole-plate enlarging lantern with limelight, but unless I insert a circle of ground glass just behind the condenser, which, of course, increases the exposure necessary to a prohibitive extent, I get every little scratch and even retouching medium reproduced in a very objectionable manner. Now to my questions—(1) Would the arc light, using the circle of ground glass behind the condenser, reduce the exposure and get rid of the lines objected to? (2) Would an arc light of six amps. give a satisfactory steady light for enlarging purposes? (3) Can you give me an idea of the power of an arc lamp necessary to work an enlarging camera by reflected light instead of using a condenser, i.e., by throwing the light upon the reflector of my daylight enlarging apparatus? (4) If there is a book published upon this subject, I should like to know of it, that I may read up the subject thoroughly before moving in the matter."—In reply: (1) Yes, to a great extent it would. Two thicknesses of ground glass would, perhaps, be a greater improvement. (2) Yes; though six ampères and fifty volts is rather a smaller light than is generally used for the purpose. But it is simply a question of exposure. (3) Here, again, it is merely a question of exposure, but to get it within reasonable limits much stronger light will be necessary than when employing a condenser. (4) We know of no work dealing with the arc light for enlarging purposes.

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EX CATHEDRÂ.

e Professional otographers' sociation.

We are happy to announce that a further and most important stage in the history of the Professional Photographers' Association was reached on Friday last, April 12. e first meeting of the Provisional Committee was held on t evening at the rooms of the Royal Photographic Society, Russell-square, W.C. A considerable amount of busis was transacted. The title of the Association as given he heading of this paragraph was decided upon, and the scription was fixed at five shillings per annum. After ch discussion it was resolved that assistants shall not be ible for membership of the Association; and the vital tter of defining a "professional photographer" was carey gone into; the exchange of views on the point will, s believed, enable the Committee to frame a definition ch shall meet the case of the Association. It will be embered that the meeting at Anderton's Hotel decided t the Provisional Committee shall exist for three months y—a length of time considered to be sufficient for the proper organization of the Association. The following officers, chosen at last Friday's Committee meeting, will therefore only act provisionally: Chairman of the Committee, Mr. Thomas Bedding, F.R.P.S.; Vice-Chairman, Mr. Alexander Mackie, F.R.P.S.; Hon. Treasurer, Mr. Wm. Grove (of Messrs. Window and Grove, 63A, Baker-street, London, W.); Hon. Secretary and offices, Mr. Alfred Ellis (of Messrs. Alfred Ellis and Walery), 51, Baker-street, London, W. The four officers mentioned were appointed a Sub-Committee to draw up rules, &c., and its first meeting will take place this evening (Friday), April 19. It may be useful to remind intending members of the Association that, besides the four gentlemen named, the following constitute the Provisional Committee:—Messrs. Harold Baker, H. Walter Barnett, F. A. Bridge, Robert Beckett, G. R. Cleare, H. J. Dalby, J. Done, R. H. Ellis, H. E. Hull, F. Hollyer, W. G. Parker, E. Milner, W. E. Wright, Lang Sims, H. W. Newton, Dowdall, Green, H. Hallier, Gibbs, E. D. Lavender, all of whom, with two unavoidable exceptions, attended last Friday's meeting—surely a most encouraging start! In Mr. Grove as Hon. Treasurer and Mr. Alfred Ellis as Hon. Secretary, the young Association could not be better served, and their names as office-bearers may be taken as the most unfailing indication that London is earnestly desirous of co-operating with the provinces in the work of the Association. For the future, then, let it be understood that all communications relating to the Professional Photographers' Association must be addressed to the Honorary Secretary (pro tem.), Mr. Alfred Ellis, 51, Baker-street, London, W. The work of drawing up rules and outlining a Scheme or Constitution on the bases of the suggestions made by the Chairman of the meeting at Anderton's Hotel on March 28, will be pushed forward rapidly, and we anticipate that in a short time every professional photographer in these islands will receive a communication direct from the Committee. In again wishing the Association success, may we ask the hundreds of correspondents who have written us on the subject during the past two months to accept from us the assurance that, in our opinion, everything points to the early growth of the Association into a large and power-

ful membership. One thing we promise: no effort, no labour, no trouble on our part shall be spared in promoting this most deserving cause.

* * *

The Photographic Trade Association. The first public meeting of the Photographic Trade Association was held on Thursday in last week, and naturally attracted a very large attendance of members and others. We have not hitherto had an opportunity of referring to this very necessary Association, which should have been formed years ago, for obvious reasons. Readers of the JOURNAL hardly need reminding that for weeks past much of our time has been occupied in the preliminary work of personally initiating the Professional Photographers' Association—an organization that has been urgently demanded for years. This work being now happily and successfully out of hand, we turn with pleasure to the Association formed in the interests of the dealers and the trade. So excellent a movement deserves the support it invokes. Thursday night's meeting dealt with the formalities of rules and the election of Council, and it was stated that the Association now numbers 600 members. The principal item on the agenda was the reception of the "report of the Executive Committee on the new conditions of sale imposed by Kodak, Limited." In reply to the Committee's circular, it was stated that nearly a thousand dealers had expressed disapproval of the Kodak conditions; and about fifty the contrary view. A lengthy discussion terminated by the opening of a fund, to which a sum of about £400 was subscribed in the room, for the purpose of testing the legality of the Kodak conditions. The dispute between the Company and the trade is, we perceive, being ventilated in some of the morning newspapers, and both sides of the case have been given. With regard to the point at issue, we expressed ourselves fully and clearly in our article of March 29. The view we took on that date remains absolutely unchanged, and we have nothing to add to or subtract from what we then wrote. The Trade Association has been formed at an opportune time. Competition amongst the manufacturers has become extremely keen, and our advices from the Continent and America point to the probability of further attacks on the English market from abroad. The outlook is lively, and we can quite imagine that in undertaking the task of reconciling the interests of the various groups of its members—retailers, wholesalers, and manufacturers—some nice difficulties may confront the Trade Association.

* * *

The Eternal Poisons Act. Our contemporary, "The Pharmaceutical Journal," takes umbrage at our recommending representative photographic bodies, such as the Professional Photographers' Association, to give active support to the newly formed "Traders in Poisons and Poisonous Substances for Trade and Technical Purposes Protection Society." In its comments our contemporary charges us with "petty spite against chemists," and controverts our statements that pharmaceutical chemists are great infringers of their own law, or charge fancy prices for the scheduled articles as compared with what they are supplied at by photographic dealers. The majority of our readers are able to judge for themselves, from their experiences when purchasing scheduled chemicals, as to whether the conditions of sale, as laid down by Act, are always complied with, and the prescribed formalities gone through. In some cas they may be, but how frequently not? As to the charg made for them, as compared with what they might ha obtained them for from their dealer, they are fully awa At the time we wrote the note—re the Dublin cases—th does not meet the approval of our contemporary, we h not the Irish Poisons Act before us, and we were in dou as to whether the oxalates were included in it. We ha it now, and they are not. Oxalic acid is, just as in t English Act. But in neither are the oxalates me tioned. Had the Dublin cases been contested we have litt doubt but that, in the case of oxalate of potash, a conv tion would not have followed. It could certainly have be proved that it was the "deadly poison," if it came with the meaning of the Act (?), that it was represented to by the representative of the Pharmaceutical Society. was a great pity that the defendants admitted any offen with regard to this sale. We shall wait to see if the Pha maceutical Society will take action against any London deal who supplies oxalate of potash. The new Society, who support we advocated, is promoting a Bill to enable deale who are not pharmaceutical "certified chemists" to supp poisonous substances, used for trade and technical purpose and not for therapeutic or medical use, nor for the prepar tions of medicines, under precisely the same conditions pharmaceutical chemists now do. The poisons are to stored in the same way, and with the same precautions, laid down by the Pharmaceutical Society. They are, wh sold, to be duly labelled "Poison," and entry made in a boo kept for the purpose of the sale, with the name of the pu chaser, and for what purpose the poison is required, & For this privilege an annual licence is required, and th licence or registration is only to be obtained by applicatio to His Majesty's Privy Council, and must be verified by th signature of a Justice of the Peace, or of the chief of th police of the borough or district within which the applica resides. This Bill, if passed, would certainly safeguard th public quite as much as the Pharmaceutical Act. Hen our advocating its promotion.

* * *

Apologists for Monopoly. In our issues for the 5th and 12th inst. a two letters on the subject, signed "Chemis and "J. Osborne," upholding the pharmaceutical monopo The former says, as has been said many times before, th the restrictions on the sale of poisons were made for th safety of the public. True, but why should not others, du licensed, be permitted to sell them under the same restri tions, when they are required only for trade or technic purposes? That is the object of the Bill the new Society promoting. Mr. Osborne rather gives his case away wh he says "The oilman may, of course, be quite capable of fulfilling the requirements of the Poisons Act the pharmaceutical chemist is, only he has given no pro of his ability, whilst the chemist has." Precisely so; bu the Pharmacy Act does not at present permit him to do i The object of the new Society is to remove that monopol Referring to our remark about the price of carbolic acid f disinfecting purposes, which, until the recent regulatio was to be purchased at the oilshop at a few pence the pin our correspondent says he would like to know where it is be had for that price. We suspect nowhere now, since th

alified chemists" have secured the monopoly in its sale. price-list now before us of one of the largest firms of lesale chemists in London, commercial carbolic acid is ed at 2s. 6d. the gallon. A cruder kind than this was lly sold at the oilshop, and, for disinfecting purposes, nswers quite as well as the purer kinds—if not better. h regard to his remark that the Pharmaceutical Society's costs amount to a larger sum, annually, over and above recovered in fines, and that the extra amount is borne rely by the chemists of the kingdom, that we can well gine, seeing that some judges, who, though they have to inister the law as they find it, have expressed their ion upon it—or rather the way in which it is enforced—ot allowing the plaintiffs their costs. Still, most busi- men will consider it a good outlay in maintaining so table a monopoly. Our correspondent further says a poison does not lose its poisonous properties because s used in photography. That is quite true; but are more poisonous when sold by a photographic dealer when they are sold by the "qualified chemist," or are e accidents likely to accrue with them? Further, our espondent adds that he has seen no report of the Sheffield s in any paper but THE BRITISH JOURNAL OF PHOTO-PHY. It is evident that he does not read the Official rnal of the Society.

APPEARANCES IN THE STUDIO.

TOGRAPHIC studios of the older type are, as a rule, any- g but apartments with a cheerful and exhilarating ap- rance, though one would naturally surmise that if they it would be an advantage, seeing that surroundings , to an extent, an influence on sitters, and on some more others. First appearances, with many, often have a ked effect, and, with such, a shabby and slovenly studio not inspire confidence in their obtaining high-class pic- s; though, as a matter of fact, it makes no difference tever in the character of the work—that depends upon artist. Yet appearances do go a long way with the eral public, and if the sitter has, at the time of sitting, givings as to the result, it is not conducive to a pleasing ression in the portrait.

Many of our readers may possibly be able to call to mind tographic businesses that have been built up in a very f period mainly through appearances and display. We w a case, a few years ago, in a country town where there e two photographers who did very good work indeed, had been going on, undisturbed, in their old "jog-trot" e for years, and were doing the main trade of the place. n a third came on the field, built a new studio, had new aratus, new furniture and appointments, so that every- ng looked bright and fresh. In a short time he had blished a lucrative business, while that of the others cor- pondingly declined. Now, this man's work was not a whit ter than, if really so good, as that of the old-established ; neither were his prices lower. But evidently the nsfolk thought they got better portraits from the new dio than they could from the older ones, which, it must confessed, had a somewhat woebegone, or, at any rate, thing but a cheerful appearance.

Studios generally have a more or less sombre and monotonous appearance by reason of the backgrounds and accessories being in monochrome, and not relieved by colour. There is no actual reason why this should be the case, for they might as well be painted in colours—that is if the photographic value of the colours employed were rightly gauged. This, however, would entail more judgment than the ordinary background painter possesses. A little colour in the studio, instead of everything in monochrome, would be, in many instances, a great relief to the eye, and enliven the place greatly.

Many photographers fail to realise the dejected and woebegone appearance their studios present to strangers. The change has crept on unnoticed by the owner. Under these circumstances Burns may not inaptly be quoted, "O wad some fay the giftie gie us, to see oursels as ithers see us." Of course, our remarks must not be taken as applying to some of the modern high-class studios; they refer only to some—and there are many—middle-class and old-school ones where we know appearances are very much neglected, as indeed they are in the reception and dressing rooms, as well as in the studio. The advent of spring light renders the shabbiness all the more pronounced to strangers. We were recently in a studio, we have in our mind, the proprietor of which is an excellent photographer, and is old-established, but is doing anything but a flourishing business. He made the remark that the improved light made the place and everything in it look very shabby, and there was no question that it did. But he said things were so bad that he could not spend the necessary money for its renovation this season. The placed looked worse than it would otherwise have done by reason of a number of antiquated accessories that were never used being stowed away in one corner with a fair accumulation of dust upon them. We quote this place because it is typical of others we are aware of.

There is no reason, however, why such places as above alluded to should not be greatly improved by the owners themselves with, or without, the help of an assistant, at a very small cost. Photographers at this season are not, as a rule, too fully occupied. Every one can use a "sash tool" and a paint brush, and with these and a few pounds of paint, and a very little labour, a great improvement may be wrought in spare times. Soap and water will also effect much, particularly with blinds and curtains, also with the furniture, especially if it be followed by a little polish. Shabby cameras and stands are always eyesores in a studio, although they are none the worse for that in the results they yield. Yet some observant sitters may have misgivings on the point. These, however, may easily be renovated by any one at little or no cost. If the woodwork of the camera be carefully cleaned with soap and water, taking care that no dirt is left in the corners and crevices, and afterwards one or other of the well-known furniture "creams" or "revivers" be applied according to the directions supplied with them, the apparatus will look almost as good as new, particularly if the bellows, after being freed from all dust and dirt, be given a coat of leather varnish. This may be obtained from any dealer in bookbinders' material. The camera stands may be similarly dealt with, with soap and water in the first instance. Then, if the wood be unpolished, as some is, an application of glass-paper, followed by a mixture of boiled oil and turpentine sparingly applied, will

greatly improve the appearance. Emery-cloth will do the needful with the metal work. Indeed, with a little trouble the whole of the apparatus may be made to look, at least to a layman, quite like new.

If all the shabby accessories that are not in use be removed entirely, they will no longer disfigure the studio, and thus give the place a brighter look. Backgrounds and composition accessories can easily be improved by touching them up in the damaged parts with colour—distemper or flatting, as the case may be.

Our chief object in this article is to call attention to the fact that shabby surroundings are the reverse of inspiring confidence in customers, and often influence business, as many are much influenced by appearances. Also to point out that they may always be greatly improved without any large outlay, with a little extra industry on the part of photographers whose limited means will not enable them to call in the aid of skilled workmen, or replace the old apparatus by new.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

II.

HÜBL, having laid down the principles which should be observed in the choice of the pigments both for trichromatic printing and the superposition of stained gelatine films, goes on to consider the photographic processes involved, and immediately emphasises the importance of the connexion between the colours and the preparation of the negatives, and gives the following figures and statements as to the necessary sensitiveness of the plates which are to be used for preparing the negatives, prefacing the same by an explanation of the formation of the reproduction by means of the three colours, and showing, as will be seen, that if the printing inks are altered so must the photographic processes.

Taking first the theoretically correct colour system, yellow, blue-green, and crimson,[1] Hübl says, "As will be seen from the colour chart (fig. 3) the mean absorptions of these rays occur at—

Yellow 103, F ⅓ G,
Blue green 45, C ⅔ D,
Crimson 68, close in front of the E line.

"The plates are to be so sensitised that a maximum sensitiveness must correspond to those places in the spectrum which in the accompanying figure (fig. 5, I.) are designated *b*, *r*, *g*.

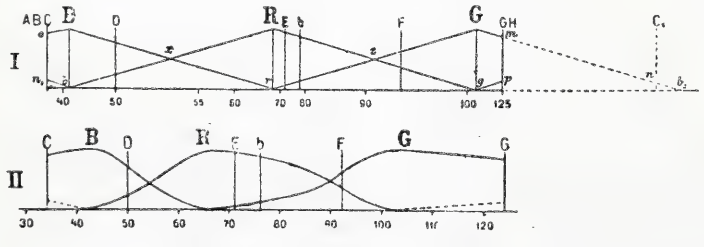


FIG. 5.

"In the colour circle spectrum *r* lies in the middle between *b* and *g*, as the colour tones belong to an equilateral triangle.

"The plate for the preparation of the red printing negative has to be sensitised for the space *b g*, and in such a manner that its sensitiveness decreases towards *b* and *g*, according to the straight lines R *b*, R *g*. In order to obtain the necessary sensitiveness for the yellow printing plate, the maximum sensitiveness has to be placed at *g* G, and the point G to be joined with the mean absorption points *r* *b* of the two other colours. The result is that for the decrea sensitiveness towards green, we get the straight line G *r*. In orde obtain the line of sensitiveness towards *b*, the line must be carrie far beyond the violet into the red till one again reaches the colou In the diagram this prolongation is shown as a dotted line, and or C *c*, corresponds to the whole spectrum joined together. straight line G b_1 represents then the second part of the curve sensitiveness of the plate which is used for the negative, for yellow printing plate. Of this straight line, however, only the p G *m* lies in the ultra-violet part of the spectrum, the piece *n* b_1 belo to the spectrum red and *m n* is entirely wanting in the spectr The plate is therefore to be sensitised not only for the blue-gr and blue, but also—though in a less degree to the reddish orang its ratio of sensitiveness is characterised by the straight lines *r* and *n b*.

"In a similar manner it will be seen that the blue printing pl should have a colour-sensitiveness included in the straight lines *r* and *g p*, therefore this plate should possess also a trace of blue-vi sensitiveness.

"As the distance *b* b_1 is formed by the three sides of an equilate triangle, the colour corresponding to the point of intersection *x* m be equal to that of the yellow, and the colour corresponding to point *z*, be equal to that of the blue printing ink.

"If the sensitiveness lines are imposed on the prismatic spectr in the previously mentioned manner, we obtain the Diagram II. (5), the curves of sensitiveness B, R, and G, to which the plates ou to correspond in the spectroscopic tests.

"The sensitiveness curves for the stable colour system—yell madder lake, and Berlin blue. The tones corresponding to the me absorptions of these colours lie, as will be seen from the colour circ

For Berlin blue at 50, thus on the D line,
„ madder lake „ 82, „ „ E ½ F, and
„ chrome yellow „ 103, „ „ F ⅓ G.

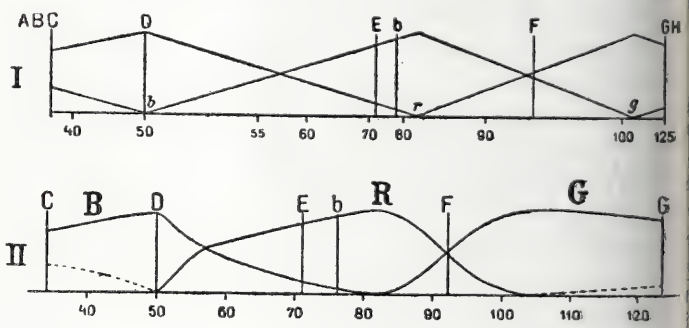


FIG. 6.

"The points *b*, *r*, and *g* (fig. 6, I.), of the colour circle theref determine the maximum sensitiveness of the plates and the sensiti ness has to follow the straight lines. If these are imposed on t prismatic spectrum we get the curves of sensitiveness B, R, and G, which the spectroscopic behaviour of the plates has to correspon In a similar manner, the sensitiveness curves of a four-colour syste may be constructed.

"The sensitive zones for the photographic plates to be used f three-colour printing extend therefore always over a considerab portion of the spectrum. The sensitising of each of the three plat is influenced by all three plates; it has therefore to be suited, n only to one colour, but to the whole colour system. If one of th colours is changed, it requires a change of the sensitive zones of a three plates. If the sensitising is dependent only on the colour f which the negative is determined, there would be always the san sensitising; for instance, for the madder lake and chrome yellow, ar if one chose one time a Berlin blue, and another time a blue-green a the third colour, the resultant compound colour must always be th same, which obviously is not possible.

"In order to obtain the necessary broad bands of sensitiveness, it essential as a rule to use a mixture of colour sensitisers, and the zone of action has to be corrected by interposed light filters. On th basis of spectrographic exposures only can such a suitable preparatio

[1] Hübl throughout uses the term "Purpur," but as the corresponding English word "purple" conveys generally the impression of a totally different colour, it has been considered advisable to substitute the word crimson, which is the term that more nearly describes the colour of nachtrosa.

the plates be found. Mixtures of useful dyes are chosen as sensi-rs, their proportions altered and their actions corrected till the trum photograph shows a band of sensitiveness that corresponds he curves found as above.

As we indeed want a simple method of comparing the intensities the course of the sensitiveness bands, their appearance alone nishes us in this respect no reliable support. It is therefore isable to make exposures on the determined colours, in order in way to obtain a control for the correctness of the sensitising. the three pigments which are chosen as the fundamental colours photographed, two of these must act on each of the three plates white, and the third like black. This result can only be hoped for, vever, if the colours are of absolutely equal and faultless purity, ich, as a rule, especially with the blue colours, is not the case.

"The pigments which are complementary to the fundamental ours are more suitable for this purpose, and which, as they have the ivity of the fundamental colours, must appear on each of the plates. ch colours may be taken from the colour chart or obtained through colour circle. A reddish blue, of the colour of a not too dilute ution of cyanine is thus complementary to the yellow printing ink, l therefore such a pigment must be represented in the red and blue gative, as equal and half as dense as white. Thus also vermilion y be used as the complementary colour of the blue-green, and st act on the plates which are to be used for the preparation of the l and yellow impressions equally strong and half as vigorous as ite. The same behaviour must be shown as regards the blue and llow printing negatives by the green, which is complementary to chosen crimson."

The British Journal of Photography has already published digest of Hübl's practical directions for sensitising the plates and king the colour screens. E. J. Wall.

THE SCIENTIFIC VALUE OF PHOTOGRAPHY FOR ASTRONOMICAL INVESTIGATIONS.

[A Paper read before the Edinburgh Photographic Society.]

The first application of photography to astronomical research was event no less epoch-making than was the invention of the tele-pe itself. It has been likened to the invasion of electricity on the l-time methods of illumination; and, indeed, just as a few brilliant ventions transformed electric lighting from a scientific curiosity o an eminently practical reality, so have the many and varied provements in photography rendered that art an indispensable xiliary in any modern observatory. I purpose in this paper to licate briefly the nature of the revolution in astronomical method us brought about, though it is impossible, within the limits of such paper as this, to give more than a general, and at best very perfect, sketch of some of the results so obtained. Indeed, there is e highly important department of our work on which I shall rdly touch at all—that of spectroscopic photography; for any scription of this must of necessity be more or less technical, and ould require, for anything like adequate treatment, a whole paper itself.

It is just sixty-one years since Daguerre's great discovery first tonished the world, but at that time there were very few who eamed of the future value of photography in the arts and sciences. is interesting, however, to recall the almost prophetic words of one hose forward gaze *was* keen enough to foresee something of its ssibilities—the famous Scottish scientist, Dr. Thomas Dick, whose orks on popular science are still useful and delightful reading, and ere, moreover, the means of first starting on his magnificent career hat giant among astronomers, Professor Barnard, of Yerkes.

In his "Practical Astronomer," published in 1845, Dr. Dick says: It is not improbable that this art (*i.e.* photography), when it approx-nates to perfection, may enable us to take representations of the ublime objects of the heavens. The sun affords sufficient light for his purpose, and it is by no means improbable that one may obtain n accurate delineation of the lunar world from the moon herself. . . . Nor is it impossible that the planets, Venus, Mars, Jupiter, and Saturn may be depicted in this way, and objects discovered which cannot be descried by means of the telescope. It might, perhaps, be considered beyond the bounds of probability to expect that very distant nebulæ might thus be fixed, and a delineation of these objects produced which shall be capable of being magnified by microscopes; but we ought to consider that the art is yet in its infancy, that plates of a more delicate nature may yet be prepared, and that other properties of light may yet be discovered which shall facilitate such designs."

Were Dr. Dick alive at the present day, he would be amazed to find how much of his prediction has come true. But not even his so active imagination could have foreseen the marvellous extent to which astronomy at the close of the nineteenth century would be influenced by the light-picturing process developed by Daguerre.

Within a few months of the announcement of Daguerre's discovery the first celestial photographs were obtained. These were daguerreotypes of the moon, taken by Dr. J. W. Draper, of New York, and though they were not very good, they foreshadowed something of future success. But while the daguerreotype was the only available process, no great progress could be made, and the same is true of the collodion method which succeeded it. Both were inherently unsuitable for astronomical work, and it is surprising that any really useful results were accomplished by their aid.

The invention of gelatine dry plates was, however, a decisive event in the history of astronomical photography. Since then the uses of the camera as an astronomical instrument have multiplied at a prodigious rate. Its versatility appears unbounded. Hardly any task has found it unready or incapable. "It is the very Ariel of the astronomical Prospero." A volume might be written on its successes, while its comparative failures would scarcely fill a page. Few departments of astronomy remain in which the eye has the advantage over it.

Now, the reason for this is not, as is so often said, that the photographic plate is more sensitive to light than the human retina. That is a popular fallacy. The fact of the matter is, that the eye, if it is to see at all, must see *at the first glance*, while it is the happy faculty of the sensitive plate that by merely looking long enough it can see anything there is to be seen. The human retina can retain an impression only for a short time—perhaps about one-seventh of a second; consequently there is no cumulative effect of the luminous impression to be obtained by prolonged watching. But the sensitive plate knows no such fatigue. The vibrations of the waves of light throw themselves assiduously and persistently on its surface, and steadily apply themselves to the task of shaking asunder the molecules of silver salts in the gelatine film. Just as the waves of ocean by incessantly beating against a shore will gradually wear away the mightiest cliffs, so the innumerable waves of light incessantly impinging upon a single point of the plate will at length effect the necessary decomposition, and so engrave the image of the star.

Obviously this process will be more complete the longer the exposure which is permitted. Now, in taking celestial photographs of very faint objects, we can give exposures of many minutes and even of many hours. Indeed, it is a common thing to give an exposure lasting throughout the whole of three successive nights—the instrument being covered during the day, and the utmost care being taken to keep it directed night after night to the same part of the sky. Every additional minute of exposure means a greater accumulation of the effect of starlight, and thus may mean the bringing of new intelligence from farther and farther sky-depths. Hence it is that a star altogether too feeble to produce any impression upon the most acute eye, even when it is gazing through a telescope of the greatest power, may yet be competent to leave its record on the plate. Thus photographs of the heavens disclose to us the existence of thousands of stars which could never have been detected except for this cumulative method of observation which is the essential prerogative of photography.

You may ask, then, is it possible to penetrate space to an absolutely limitless distance? Does a plate exposed hour after hour and night after night *continue* constantly receiving new impressions of stars, or does there come a time after which no additional amount of exposure will produce a new image on the plate?

The latter appears to be the true state of the case. Dr. Roberts has found that lengthened exposure need not necessarily mean an increased number of stellar images, and that there are even districts in the sky which are, so far as we can ascertain, absolutely void of stars. We are thus led to the belief that the part of the starry realm visible from our earth is limited in extent. Notwithstanding the enormous assistance afforded by the photographic method, there is still a *ne plus ultra*, where we are again brought to a standstill, perhaps because of the inadequacy of the space-penetrating powers we at present possess, perhaps because there exists only utter emptiness beyond the universe which we know, or perhaps because the ether which seems to us so all-pervading is confined to our universe as the atmosphere is to the earth, so that there is no vehicle to convey to our senses any information whatever of worlds beyond our ken.

There is another peculiarity about photographic methods of observation which gives them an importance from quite a distinct point of view. The radiation from a star consists of a number of rays of very varied hues all blended together. These rays may be divided into two great groups—those which are able to affect the eye and excite the sense of vision, and those which are incapable of doing so, and are therefore quite invisible. Now, it happens that the rays with which photography is concerned lie partly in the visual portion, but chiefly in the invisible part of the star's radiation. And this affords another reason why the camera may, and indeed must, largely extend our conceptions of the extent of the universe, for it will grasp and depict light which would be utterly wasted so far as vision is concerned. Even if those chemically acting rays were poured in torrents into our eyes, they could excite no sense of vision, and a star whose light is composed of such rays would be absolutely unseeable even in the most powerful telescope, though perfectly capable of being recorded by a photograph.

This phenomenon comes into play in a very pronounced fashion when we attempt to measure by photography the relative magnitudes of the stars. No visual means have hitherto been found competent to deal with this problem in its completeness. It is easy enough with the help of certain instruments known as photometers to estimate by eye the relative magnitudes of the brighter stars, but with faint stars estimates so made break down. What is called "photographic irradiation" affords, however, another method of photometry. The particles directly meeting the stellar rays reflect them irregularly all round to other particles in the film, thus widening the area of chemical decomposition, and creating circular images which, with the same exposure, and on the same plate, are found to vary in size with the magnitudes of the star they represent—a brighter star producing, *ceteris paribus*, a larger disc on the plate. Even in this way, however, the faintest stars give rise to dots so small that their differences cannot be reliably measured; but for these lowest ranks of stars a fairly accurate estimate of their comparative brightness may be obtained from the relative lengths of exposure necessary to get their impressions at all.

What I wish particularly to draw attention to, however, is this, that the size of the disc produced by a star on a photographic plate is not always a safe guide to the real brightness of the star as we see it in the sky. Red stars, stronger in visual than in photographic rays, give smaller discs; while bluish stars, feebler in optical and richer in photographic rays, make a larger disc than would be expected from their appearance to the eye. There are many stars in the sky which, though apparently single, are really double, consisting of a large star with a smaller one revolving round it. It has been found that the larger star is generally yellow or red, while its smaller companion is commonly a bluish colour. But a photograph of such a binary star often shows a curious reversal, the smaller star giving a larger disc than it primary does, simply because of the preponderance of actinic rays in the light it emits. These cases, nevertheless, are the exception and not the rule, for the eye and the sensitive plate in general agree in estimating the graduations of stellar light, and even the exceptions may, I believe, be put right by the use of orthochromatic plates and colour screens.

The sun, from its abundance of light, offered special inducements to the early workers in photography, but the method was applied too late to discover any of the great laws of solar activity. The principal outcome of solar photographs hitherto has been rather to confirm t results previously obtained by patient eye-observation. At the sa time photographs of the solar surface in all its varied moods are extreme interest and importance. *Facile princeps* in this branch astronomical photography is M. Janssen of Meudon, who long a succeeded in making by far the best photographs of portions of t sun's surface which have ever yet been made. They show t granulations of the surface and the details of the sun-spots a faculæ with admirable clearness. Janssen has always used the o wet-plate process, which, oddly enough, seems to give the best resu in solar work. The instrument he uses is a very crude affair. T lens, five inches in diameter, is placed in a wooden box, which mounted on an old camera stand on rollers. It is not provided wi clockwork. When Janssen wishes to photograph the sun, he whee this primitive machine, stained and daubed with nitrate of silve from a shed on to a platform, elevates it towards the sun, makes a exposure with a rapidly moving slit, and secures a photograph suc as hitherto has not been approached in excellence.

From the importance of a more thorough understanding of th effects of the sun upon the climate of the earth, daily photograph of the solar surface are made at a number of observatories, *e.g.*, a Greenwich, Kew, and in India. These have been kept up for a gre many years, and probably no single day goes by without photograph of the sun being made at one or other of these stations. One thin which this repeated and constant photographing of the sun ha proved, is the non-existence of any planet nearer the sun tha Mercury. For if such a planet did exist it would frequently be see to pass across the sun's disc; and, indeed, before the days of photo graphy many astronomers fancied they had actually witnessed suc transits. But in all the long series of solar photographs which w now possess, no strange thing occurs, unless perhaps, on one made i India, where a distant bird was caught in its flight, and shows it head and outspread wings clearly projected against the sun.

Probably the most important contribution to our knowledge o solar physics which photography has made has been during th observation of solar eclipses. A total solar eclipse lasts so short time—never more than just a few minutes—and there is so much t see and note during its occurrence, that it need not be a matter o surprise that drawings and descriptions of the phenomena observe differ very widely.

As you are no doubt all aware there is one portion of the su which the eye of man cannot see by any means whatever, excep when the glare of the sun as we see it is shut out by the occulting moon. Then and then only is there visible the strange white sheen of the Corona—that mysterious solar extension of radiant filaments and beams, and sheets of pearly light, which stream out to a distanc numbering many thousands of miles from the solar surfaces, formin an irregular halo with the black globe of the moon in its apparen centre.

To determine accurately the constitution and form of the coron has long been one of the grand problems of astronomy, and th testimony of the camera in this case is invaluable. For example, a the eclipse of 1878 a great many drawings of the corona were made by eminent astronomers, but a subsequent comparison of these showed that scarcely any two could be supposed to represent the same object, and that none of them at all resembled some photographs which were also made at the same time, and which agreed perfectly with one another. The method of free-hand drawing of the corona received its death-blow at that time, for it showed the utter inability of the average astronomer to sketch or draw what he really saw under the circumstances. Before this time some scientists had thought that the corona was simply an atmospheric effect, but the photographs taken at stations hundreds of miles apart give so precisely the same details of form and structure that no doubt can remain as to its being truly a solar appendage.

In speaking of this eclipse, and of the success attained by photography at that time, it is perhaps well to mention the evil influence which the old method had upon at least one observer. A Mr. Holiday had made observations of the corona from a housetop, and thus describes the result in his report:—"As soon as the eclipse was over, I came down from the roof and plunged my head into

'old water, for I was violently excited, and before breakfast I had nade three drawings from my memoranda." If photography had lone nothing more for astronomy than to prevent occurrences of this kind, it would at least deserve lasting respect from a humane point of view.

You are all so familiar with lunar photographs that I need spend ,ut little time on them. Exquisite as many of them are, it is still :he case that what is shown by the best lunar photograph has not yet approached what can be seen with a good telescope of very moderate size. Prof. Pickering avers that "the best lunar photograph ever taken will not show what can be seen with a ;ix-inch telescope under favourable atmospheric conditions." For general outlines, for completeness of coarser detail, and for purposes of future testimony, the photograph clearly stands unrivalled; but as regards what is really most interesting upon the moon—the finer detail and more delicate features where alone, if any lunar change ever occurs, that change will show itself—the photograph does not even hint at their existence. Atmospheric agitations are one cause of this imperfection in lunar photographs. The eye can seize the instant of exquisite definition; the camera must take what comes. Another cause is to be found in the disparity of actinic intensity in the various lunar formations, which is so great, that, in order to get an ideal picture, a different length of exposure should be given to each. What is enough for a plain—to take an example—is too much for the crater rising from it, or for the rampart enclosing it.

In the autumn of 1882, the world was thrilled by the advent of a magnificent comet, which suddenly appeared near the sun in September, and for the next four or five months delighted every one with the splendour of its display. Attracted by the great brilliancy of the comet, Sir David (then Dr.) Gill, at the Cape of Good Hope, with the aid of a local photographer and his 2½-inch Dallmeyer rapid portrait lens of 11-inch focal length, secured a fine series of photographs of the comet with dry plates, and exposures of from half-hour to an hour. When these reached the northern hemisphere they attracted a great deal of attention, not only on account of the comet itself, but also from the number of stars impressed on the plates.

At this time the Brothers Henry of Paris were making a chart of the stars along the ecliptic by eye observations, for the purpose of finding out new minor planets by their slow daily movement amongst the stars. They had at this time reached the region of the Milky Way, and the marvellous wealth of stars they encountered upon entering the boundaries of that vast zone completely discouraged them. At this juncture Dr. Gill's comet photographs came to their notice. They were struck with the great numbers of stars shown on these pictures; it came to them as a revelation of the power of photography in this direction, and incited them to attempt the use of this wonderful process in making their charts. It was to this simple incident that the active application of stellar photography is due. They began at once the construction of a suitable photographic telescope of thirteen and a half inches diameter; it was soon completed, and the exquisite star pictures produced with it, the photographs of nebulæ, and of some of the planets, were perfect revelations.

One of their first and greatest successes was their famous photograph of the Pleiades. In an exposure of an hour 1421 stars were photographed. But that was not all; round one of the principal stars a nebula was discovered whose existence had not formerly been suspected, and which even afterwards could only be seen with the most powerful of existing telescopes. A later photograph, with a longer exposure, showed still more; for now it was seen that the whole group of stars is filled with an entangling system of nebulous matter, binding together the different stars of the group with misty wreaths and streams of filmy light, nearly all of which is entirely beyond the keenest vision and the most powerful telescope. This is largely due to the fact that nebular light is much more actinic than usual, and therefore, of course, much more photographic. This photograph is interesting for another reason, and indicates very forcibly the revolution brought about in astronomical methods by the aid of photography. M. Wolf, of the Paris Observatory, a most industrious and skilful worker, had devoted three years of unremitting labour to the formation of an accurate chart of the Pleiades. His catalogue contains only 671 stars, so that the photograph done in one hour (or rather three hours) shows more than twice the number of stars, and represents them, moreover, as M. Wolf does not quite, with absolute accuracy and precision.

I have remarked that the object with which MM. Henry were charting the heavens was that they might thus pick out any small minor planets by their movements among and between the stars. Curiously enough the photographic methods which they thus introduced not only did away with the necessity for mapping the stars, but also gave a new means for discovering these asteroids. For while the stationary stars make circular images on the plate, the moving asteroid makes a trail, and is thus identified at a glance whenever the plate is developed. The first discovery of this nature was made in 1892; and since then they have been discovered simply wholesale by this method, a very large number having now been observed. Indeed the supply of goddesses after whom to name these worldlets is running out, and has to be reinforced by apotheosis or invention, so that already, to some extent, as Professor Holden remarks, the asteroidal catalogue "reads like the Christian names on the roll of a girls' school."

While speaking of discoveries made by the aid of photography, I must just mention two others, namely, the discovery of double stars in which the components are so close as to defy separation visually; and the discovery of many stars whose brightness varies, and whose images on the plate are consequently periodically larger and smaller. I ought to say, too, that star photographs are susceptible of very accurate measurement, and are eminently suited in this respect to afford data from which to estimate the distance of the stars. This is derived from a series of measures, made at different seasons of the year, of the space between the particular star whose distance is required, and another star lying nearly in the same direction. If, therefore, a series of photographs at different seasons be obtained, the measurements made on these will disclose the star's distance, if it be sufficiently near to admit of the application of the process.

I come now to one of the most remarkable results attained in recent times in the domain of astronomical photography, namely, Professor Barnard's pictures of the Milky Way. This stupendous star-cluster is not susceptible of accurate measurement, and hence it is useless to photograph it with a large photographic telescope designed more for accurate representations of star-positions. The aim of the astronomer here is to obtain as correct an idea as possible of the structural peculiarities of the galaxy. Though so conspicuous an object to the naked eye, the view we thus get of it is not sufficiently tangible, from lack of detail, to enable one to form any more than a crude idea of its coarser features. What we require, therefore, in the study of this wonderful object is something that will increase the penetration of our vision, and at the same time give us a certain amount of accuracy of position with a large field of view, so that we may study its peculiarities of structure in detail, and at the same time closely locate these details with reference to the whole, and thus, by finally putting structure and detail together, form a comprehensive idea, not only of the details themselves, but also of the relation of these features to each other. Now, the long-focus telescope with a very limited field is not capable of dealing with the Milky Way in the manner stated. Its structural details are very large, far larger in general than the field of view of the ordinary photographic telescope, and vastly greater than that of a powerful visual telescope. We want, therefore, a short-focus instrument, one capable of not only taking in a wide part of the sky, but also of giving a brilliant image; or in other words, we require the reduction of the large details to a smaller scale, with a correspondingly great increase of effective light power.

These conditions exist in the large portrait lenses which were needed in the early days of photography to reduce the exposure time by collecting a great quantity of light from the object and which in these days of rapid dry plates are no longer required for portrait work. Taking in some ten or twelve degrees of the sky these lenses are specially suitable for photographing large surfaces, such as are presented by the Milky Way. Those who have seen Milky Way photographs made with an ordinary photographic telescope, or who

have tried to make out its complexities with a visual telescope, must be struck with the remarkable beauty of the pictures obtained with these portrait lenses. They show many peculiarities which must materially alter our ideas of the constitution and structure of the galaxy, and they have brought to light in it a great mass of very diffused nebulous matter, apparently freely mixed with the groundwork of stars, and differing in many respects from the ordinary nebulæ of the sky. It must be in the study by photography of such regions that we shall finally clear away some of the mysteries of the galaxy, and approach more nearly to a solution of the universe.

These old-time portrait lenses have made another very important revelation in connexion with comets' tails. The photographs of Swift's comet taken with their aid in 1892 showed that most extraordinary and rapid transformations were taking place in it. This comet was an insignificant affair visually, and even in the telescope showed no sign of any untoward features; yet the photographs showed the tail one day whole and next day broken up into streamers, while on another day the plate showed a second comet formed within the first having a system of tails of its own. Other amazing changes of a similar nature have since been observed photographically in several later comets, but all of these marvellous phenomena would have been unknown to astronomers but for those pictures, and these comets would have passed without any unusual notice.

I have mentioned these photographs of the galaxy and the comets because I should like to emphasise the fact that there is a large part of celestial photography which requires no elaborate or expensive apparatus, and in the delights of which all of you here are perfectly capable of sharing. Each one has, of course, his own particular taste, and many of you may find other departments of your science more fascinating than this; but I am sure that any of you who attempt celestial photography will find yourselves more than repaid, not only by the beauty and novelty of your results, but also by their constant unexpectedness, for it is one of the charms of such work that you really never know just what you will find on your plate.

Even with a small lantern lens of $1\frac{1}{2}$-inch aperture and $5\frac{1}{2}$-inch focal length, wonderful pictures may be got. Moreover, it will photograph in a few minutes what the ordinary quick-acting portrait lens would require several hours to take, and will show faint nebulosities quite beyond the reach of the larger photographic telescopes. The action of these lenses upon celestial objects of large field does not seem to be strictly subject to the ordinary law of the ratio of aperture to focus; it seems to be always quicker with the short focus than the law requires. With the small lens referred to, the earth-lit portion of the new moon was readily photographed in a single second, while with a six-inch portrait lens of ratio one-fifth, from twenty to thirty seconds were required to show it well. The brighter cloud forms of the Milky Way were shown in from ten to fifteen minutes' time, while with the larger lens upwards of three hours were required; and faint extensions of nebulæ, like that in Orion, have *for the first time* been revealed by these small lenses on plates, and by processes which are in all respects the same as those you ordinarily employ.

Thus it is no paradox but simple fact to say that the non-possession of elaborate and highly specialised apparatus, far from being an insuperable obstacle, is, in many ways, a positive advantage for celestial photography. There is, therefore, the greater inducement for some of you at least to attempt it; and when you are in the mood for an experiment, or are in want of a new subject, may I hope that you will point your cameras heavenwards, and find a new delight in the portraiture and the study of the wonders of the sky?

George Clark, M.A.,
Assistant Astronomer, Royal Observatory, Edinburgh.

THE LATE FRANCIS COBB.

By the courtesy of Sir Henry Trueman Wood, M.A., the editor of the "Journal of the Society of Arts," we have received the following advanced proof of the obituary notice of the late Mr. Francis Cobb, a prominent member of that Society, and of several photographic societies, by the members of which he was highly esteemed: "Many members of the Society will receive with very great regret the announcement of the death of Mr. Francis Cobb, which took place suddenly on the 9th inst., at his office, 79, Cornhill. Mr. Cobb, whose first appearance at the Society was in 1869, when he joined in the discussion of a paper, by Mr. Thomas Dickins, on Silk Supply, became a member in 1873. In 1875 he was elected auditor, and in 1878 treasurer. This office he filled for four different periods, 1878-82, 1885-89, 1891-94, and 1896-1901. During the intervals between his treasurerships, he served as a vice-president. He was a most regular and constant attendant at the meetings of the council and of the Society, so that he had perhaps a more intimate knowledge of the working of the Society than almost any other member. His experience, therefore, caused him to be highly esteemed by his colleagues, to whom also his kindliness and unvarying sweetness of character endeared him. He will be greatly missed at the council meetings and it will probably be long before his special place can be filled. Mr. Cobb was born at Yarmouth in 1824. He was the younger son of Mr. Benjamin Cobb, and belonged to a family which can be traced back in Norfolk as far as the fifteenth century. A voyage taken for health as a lad led to his starting in business in Hong Kong. He was afterwards with Messrs. Jardine, Matthews and Co., at Shanghai, and later he settled up-country as a tea-grower and raw silk producer. He acquired a remarkable mastery over the Chinese language, and when Robert Fortune was sent out by the English Government to select tea plants for the Himalayan districts, Francis Cobb accompanied him in the disguise of a Chinaman. Failing health obliged him to return to England in 1858, and though he afterwards made several visits to China, he not long afterwards finally severed his business connexion with that country. After a short residence in Natal he settled down in London in 1870 as secretary of the Globe Marine Insurance Company, which company he helped to found. A few years ago the Globe was taken over by the United Dutch Marine Insurance Companies, and he then became secretary to the united companies. This post he held until his death.

"Mr. Cobb was an ardent photographer. For some years he was a member of the council of the Photographic Society. He was also on the committee of the Camera Club and of the Photographic 'Salon,' and acted as hon. secretary of the Photographic Field Club."

EXHIBITION OF THE WEST SURREY PHOTOGRAPHIC SOCIETY.

The Thirteenth Annual Exhibition of work by the members of the West Surrey Photographic Society was held at the Railway Hotel, Battersea-rise, S.W., on the 10th, 11th, 12th, and 13th inst.

We have much pleasure in congratulating the Society in having made a marvellous advance in the quality of its work since the last exhibition. We regretted very much that so excellent a collection of photographs could not be shown under more favourable conditions than those afforded by the room in which the exhibition was held. It is perhaps natural that a progressive Society, in an endeavour to make its exhibition as full of attractions as possible, should cultivate the trade exhibitor, and to those visitors who practice photography the exhibits of novelties in apparatus and material are always interesting, but in every exhibition the first thought should be given to the display of the pictures, and in so circumscribed a space as that available here the two things are incompatible.

We noted with satisfaction that the Society had abandoned the division of the pictures into classes. Except that a stated number of medals was offered, the system followed by the Royal Photographic Society was adopted. A feature of the exhibition was the very fine architectural work of J. G. Tryhorn; most of it was in toned bromide, but it had all the good qualities of carbon, and was quite free from the objectionable characteristics which are too frequently found in bromide enlargements of architectural subjects. Many of the landscapes were admirable. In a few cases, however, good cloud effects were marred by a want of appreciation of the relative values of sky and foreground. Several of the woodland scenes were very commendable. The portraiture and figure subjects were not so hopelessly behind the other work as one usually finds at society exhibitions.

The trade exhibitors were Messrs. Otto Scholzig, the Prosser Roberts Co., Rosenberg and Co., the Rotograph Co., and R. W. Thomas and Co. An interesting feature of the show was the display of photographs in colour by the Ives kromscop and the Sanger-Shepherd and the McDonough-Joly processes.

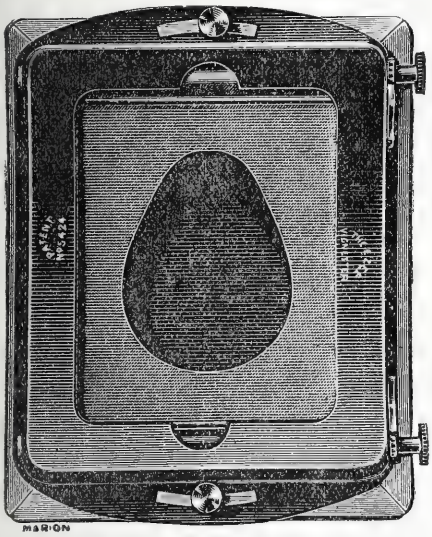
The Judges were Messrs. H. Vivian Hyde, Alexander Mackie, and J. C. S. Mummery. Their awards were a silver medal each to "The Path through the Wood," by W. H. Wilshere; "South Choir Aisle, Norwich," by F. G. Tryhorn; "Nearing the Jetty," by W. T. Marriott; "The Silvery Way," by R. H. Baskett; and "A Smoke-Fog in the Pool," by T. Digby Mottram. They also specially commended "The Old Wharf," by F. G. Tryhorn.

Our Editorial Table.

The Burgess Vignetter.

Manufactured and Sold by Marion and Co., Soho Square, W.

rs. Marion have submitted to us for our inspection the Burgess etter, which, relying on the roller blind principle for variety size of opening, affords the photographic printer a wide field of e in this department of his work. Of its kind, the Burgess etter is a veritable multum in parvo, as when once screwed e frame the adjustments are as simple as they are varied, and tting becomes a delightfully certain and easy operation. With llustration to guide him, the photographer can easily judge for lf, by the following description, how the vignetter is used. It d be mentioned that bushes and screws are provided: To attach ignetter to the printing frame, place it on the frame and mark all dot in the centre of each slot at the ends of the vignetter,



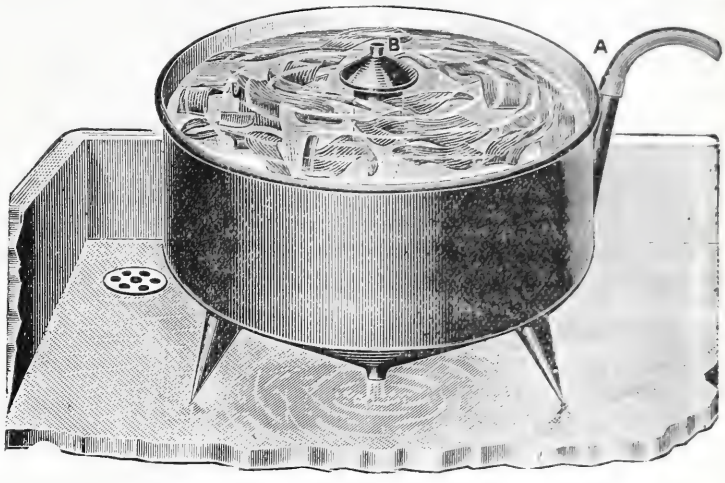
remove the instrument, and bore two holes at the points marked, enough to receive the "bushes," which should be screwed home; replace the instrument on the frame, and secure it with the s. Place the negative in the frame, and the sensitive paper in on, close the back of the printing frame, and turn the vignetter frame face upwards. By means of the rollers wind the size of tte into position which will suit the negative, drop the catches he ratchet wheels and wind tight. Tighten the screws into the s, and place out into diffused light to print. If printed in sun- slip the sheet of celluloid over the opening in the cloth and neath the flange of the vignetter. The bars at the end of the tter serve to press the cloth nearer to the negative if desired.

The "V.H." Print, Plate, and Film Washer.

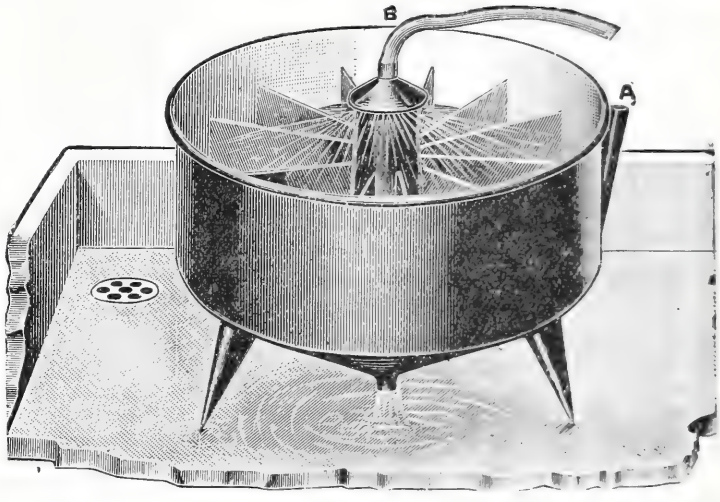
factured and Sold by Geo. Houghton and Sons, 88 and 89 High Holborn, W.C.

rs. Houghton inform us that the "V.H." washer can be seen lly in use at their showrooms, where one has been specially up for the purpose. Those of our readers who are interested e subject of efficient plate, film, and print washing—and what grapher is not?—would therefore do well to call and inspect vasher at work. We append the official instructions for using asher in both forms: For print and film washing, connect fresh tap by means of rubber tubing with the inlet pipe "A" in a manner as to ensure its not being forced off when under pres- Then turn on the tap gradually until the required force is ob- l, which should not be very great, as the prints will swing round sufficient velocity to ensure thorough washing at a moderate ure. From twenty minutes to half an hour should be ample ng under all conditions. The vessel will remain full when the s turned off, and, when desired, it can be easily emptied by y raising the central column (having previously seen that the is firmly attached to the false bottom) with the hand to a height out one inch, when it should be smartly depressed. This will syphonage, and empty the vessel, when the column with the bottom can be bodily lifted out with the prints which latter easily be removed without damage. The prints can, of course, moved while the vessel is full, if preferred, when the contents be discharged as before explained. Before placing the prints in essel it should be filled up a little more than half way. To save this may be done straight away from the tap, *i.e.*, before con- ng with the inlet.

To wash plates, remove the central column and reverse the false bottom, fitting the central column in this side in a similar position to which it occupied on the other side. Grooves are provided both



on the column and on the false bottom for the reception of plates, which, when in position, will stand vertically and radiate from the central column. In this case the fresh water tap is connected with the inlet "B," provided for that purpose on the top of the column. This



arrangement produces a spray, which can be regulated to play between each plate by slightly turning the column in its socket till the desired direction of spray is effected. The water will now rise and fall automatically, giving a number of complete changes in a very short space of time, so that ten to fifteen minutes should be quite sufficient for all ordinary purposes. This device also makes a drying rack, as no dust can get at the plates, providing the vessel be covered, preferably with a sheet or two of blotting-paper, which will readily absorb the moisture given off by the plates.

The Photographic Dealers' Annual. Edited by Arthur C. Brookes.

Published by Marshall and Brookes, Harp-alley, Farringdon-street.

The second issue of Mr. Brookes' ably compiled Annual—a "complete guide to photographic dealing"—appears at an opportune time, namely, at the beginning of the spring trade. The book tells the dealer a very great deal that is likely to be useful to him in his business: law and trade, formulæ, statistics, shop methods and ethics, colour photography, directory information—these are only a few of the subjects dealt with in a carefully edited volume, which is issued to the trade only.

The Photo-Miniature. Edited by John A. Tennant. 1s. per copy.

New York. Tennant and Ward. Loudon: Dawbarn and Wa d, 6, Farringdon-avenue, E.C.

This unique essay in photographic journalism has now reached its 24th number, and closes its second volume. Time and the accumulation it brings is obliging us to "weed out" our photographic library, but the unhallowed hands of the waste paper merchant are not likely to fall upon the dainty "Miniature." Each month Mr. Tennant sends out an exhaustive monograph on some branch of photography, and, so far as we can judge, he leaves little of the subjects he chooses for

anybody else to touch upon. Since we last noticed "The Photo-Miniature" the following numbers have been issued:—No. 13, Photographing Flowers and Trees; 14, Street Photography; 15, Intensification and Reduction; 16, Bromide Printing and Enlarging; 17, The Carbon Process; 18, Chemical Notions, &c.; 19, Photographing Children; 20, Trimming, Mounting, and Framing; 21, Albumen and Plain Paper Printing; 22, Gum-Bichromate Printing; 23, Photographic Manipulations; 24, Photographing Clouds. Our confrère Tennant may justly be proud of his work; while to English readers we say that we can conscientiously recommend these "well made" books on photography.

THE USEFUL ARTS AND HANDICRAFTS SERIES. Edited by H. Snowden Ward.

London: Dawbarn and Ward, 6, Farringdon-avenue, E.C.

THIS excellent collection of simple guides to the minor arts and crafts has reached the thirty-second number. Since we last notified receipt of a monthly copy the following additions have been made to the series:—No. 25, Pastel or Crayon Drawing, and Crayon-making, by Charles E. Dawson; No. 26, Stone Cutting and Polishing (G. Day); No. 27, Home Adornment and Furnishing (C. G. Leland); No. 28, Jewellery and Trinkets, Home-made (C. G. Leland); No. 29, China Decoration and Repair (C. G. Leland); No. 30, The Decoration of Fabrics (C. G. Leland); No. 31, Paper Work (Decorative and Useful) (F. C. Lambert, M.A.); No. 32, Gums, Glues, Pastes, and other Adhesives (Mr. Thos. Bolas). Editor and authors alike are to be congratulated on their work. The books are clearly written, and the illustrations are plain and helpful. We look upon the series as being of the greatest educational use.

LESSONS IN OZOTYPE. By Thomas Manly. 36 pp., price 3d.

Published by the Ozotype Co., 1, Weedington-road, Kentish Town, N.W.

MR. Manly announces that he issues this pamphlet as an appendix to his treatise on "Ozotype" as the result of further experiments with that process. The "lessons" are so intelligibly written that the merest beginner in photographic printing could not fail to understand them. For those who have not yet tried this system of printing the following explanatory note, taken from the preface, may be of interest: Ozotype is a modification of the carbon printing process, and produces permanent photographic pictures in various monotints. Any good paper is rendered sensitive to light by the operator, by simply coating the paper, by means of a brush, with the patent sensitising solution sold by the Ozotype Company. The dried sensitive paper is exposed under a negative to daylight in the usual way. A plainly visible image is the result. This initial print is washed in water and dried, when it will keep for years in a dry place. A piece of pigment plaster (which is paper coated with pigmented gelatine) is applied to the initial print under the surface of a bath containing acetic acid and hydroquinone. The print and pigment plaster, clinging together, are removed from the bath and squeegeed together. After the expiration of a few hours, or any time afterwards, the picture is developed in hot water.

THE IMPERIAL HAND-BOOK, 1901.

Published by the Imperial Dry Plate Company, Cricklewood.

"WELCOME as the flowers in spring." is the little photographic remembrancer that is issued about this time of year by the Imperial Dry Plate Company. The Hand-book for 1901, which is illustrated with reproductions from some clever original photographs that, in themselves, constitute a sound sermon on technique, has a valuable little paper on the phenomena of halation, and the means of avoiding an unpleasant effect only too common in photographic prints. "Hand Camera Notes," and "Angle of View," are among the other subjects dealt with. There is an announcement relating to Imperial P.O.P., and we are introduced to the Imperial Printing Girls who make their first appearance in public on the back cover, and "who are to make a wider acquaintance with the photographic world in other and still more attractive forms." A truly delightful prospect for the students of photographic periodicals! We congratulate the Imperial Company upon its prosperous growth—a result due to the sterling excellence of its preparations.

Studio Gossip.

THE Long Lost Gainsborough.—There has been considerable excitement in the art world—and amongst the public generally—during the past week or two about the recovery of the long-lost picture, "The Duchess of Devonshire," by Gainsborough. This picture, it will be remembered, was sold at auction, some twenty-five years ago, and purchased by the Messrs. Agnew for the sum of ten thousand guineas, said to have been the highest price that had up to that time ever been paid for a picture that was only a portrait. At the time of the sale there was much controversy amongst art critics as to whether the p ture was really painted by Gainsborough, or rather whether it w entirely his own work. While the discussion was going on the pict was stolen from Messrs. Agnew's gallery in Bond-street—the can being cut out of its frame, which was left behind. The picture h now been recovered from America under—according to sensatio articles in the daily press—extraordinary, not to say romantic, circu stances. We shall now, no doubt, hear more as to the picture hav been actually painted and finished by Gainsborough. Also whether is the portrait of the Georgiana, Duchess of Gainsborough, who was so w known in the political circles of her time.

"WHAT to do with our Girls."—Mr. Herbert Tear, of 12, Clapha road, writes: "I think the problem of 'What shall we do with o Girls,' is solved by the enclosed cutting from 'Answers,' April 13. may be as interesting to you as myself, who am only a poor 'Pho graphic employer':—'Photography is an excellent business for a g providing she has some taste for the subject. Hundreds of photogra ers take assistants without a premium, the general rule being that salary begins after the first three months. If she learns retouching girl may, at the end of a year, earn from 18s. to 20s., afterwards ris to 35s. weekly. Or, if she can "work up" enlargements, this wage pands to 45s. or 60s. Business hours are, in nearly all cases, 9 till Granted she is a good retoucher, she can get home-work, either by c vassing or advertising; and hundreds of girls who started with a lit occasional home-work have finally had so much to do that they h left their situations, and now do nothing else, as the pay for a fai quick worker is from 1s. 9d. to 3s. per hour. Given plenty of work, is not difficult to make £4, or even £5, a week.'" Many of our read will smile at the foregoing, which appears in a publication wh mission is to be amusing—at one penny per week.

News and Notes.

MR. Drinkwater Butt, F.R.P.S., has removed to 109, Gow street, W.C.

STONYHURST College Observatory.—By the courtesy of the Rev. Sidgreaves, S.J., F.R.A.S., Director, we have received the results meteorological and magnetical observations for 1900.

"THE Red Book."—The Affiliation of Photographic Societies Ann for 1901, has been issued. Eight thousand have been printed and copy sent free to every member of an affiliated society. The volun which is published at 66, Russell-square, has been carefully compil and is distinctly useful to those whose interest in photography is son thing more than superficial.

ROYAL Photographic Society.—April 23,—Technical Meeting. T Chapman Jones, F.I.C., F.C.S., will read a paper upon "A sim and inclusive method of testing plates." April 24,—Wednesday. exhibition of photographs not previously exhibited in London, the w of Monsieur Robert Demachy, of Paris, will be opened at 8 p.m. may be seen daily from 10 to 4 (Wednesdays 10 to 8).

THE Goldsmiths' Institute (New Cross, S.E.), classes in Photograp —During the summer term of 1901, the following courses in pho graphy will be held. These courses, which are suitable for ladies a gentlemen desirous of obtaining instruction in either amateur or p fessional photography, are of a thoroughly practical character; t provide instruction not only in the elementary and advanced proce of pure photography, but also in the various photo-mechanical cesses. Elementary Practical Photography (for ladies only), mentary and Advanced Practical Photography (for gentlemen), Ph mechanical Processes. The teacher is Mr. W. T. Wilkinson. syllabus and list of fees can be obtained at the Institute.

MESSRS. Newton and Co., of 3, Fleet-street, London, inform us t Mr. T. E. Freshwater, who has spent the whole of his life in th service, and who has been well known in the trade as one of th principal managers for some years past has been offered and accep a partnership in the firm. We congratulate both Messrs. Newton a Mr. Freshwater on this happy circumstance. Mr. Freshwater is wid esteemed in the photographic world for his knowledge and urbanity. the department of optical projection he is possessed of sound inform tion, which he is always willing to impart at society meetings elsewhere. Those who have the privilege of knowing him appreci his personal excellence and good qualities, and will, we are sure, j us in wishing him a prosperous career in his new and well deser position.

THE Forthcoming Loan Exhibition of Pictures at the Guildhall.—Sunday Opening.—At its meeting last week, the Court of Comm Council decided that the approaching loan exhibition and all fut exhibitions of the kind should be opened on Sunday afternoons, hitherto. As usual there was much opposition to the proposal, on part of some members of the Council, but, in the end, the motion carried by a majority of thirty-two. The Corporation of the City London has often been charged with extreme conservatism, but should be mentioned that it led the way in the opening of art galle on the Sunday, and the example set by it has led to the opening other art galleries. On Sunday, last week, the Edinburgh Museum Science and Art was opened for the first time on the Sunday, and attended by a large number of visitors. We read, however, that th

as a demonstration outside the building by the good people who were pposed to the Sunday opening. It was Sir William Treloar who first roposed and carried against a strong opposition, the decision to open ne City of London Art Gallery on Sundays, which set the example to thers, and to him must be credited the pleasure that so many enjoy n seeing fine works of art that their daily avocations would otherwise revent them from doing, not only in London, but elsewhere in the ountry.

ALEXANDRA Palace Photographic Exhibition.—The organizing committee of this exhibition, which will be held from May to October next, onsists of the Right Hon. the Earl of Crawford, K.T., F.R.S., and Messrs. T. R Dallmeyer, Pres. R.P.S., F.R.A.S., Alexander Mackie, George Scamell, F.R.P.S., John Spiller, F.I.C., F.C.S., F.R.P.S., H. nowden Ward, F.R.P.S., and Maj.-Gen. J. Waterhouse, I.S.C., .R.P.S. The circular that has been issued states: "The purchase of he Alexandra Palace and Park having been happily accomplished by he united efforts of the Middlesex County Council, Hornsey Urban District Board, and the North London Districts and Boroughs, and he 18th May announced as the date of the official opening as a place f recreation dedicated to the use of the public for ever, the trustees re desirous of adding to its educational value by instituting a series of xhibitions embracing works of fine art and technical processes. The bove-named organizing committee has been specially invited to collect and rrange a photographic exhibition. Two galleries adjoining the Great Central Hall have been allotted to the photographic section, and the ommittee propose to devote the present year's exhibition partly to a an collection illustrating the progress of photography since the days f Daguerre and Fox Talbot, and partly to a selection of pictorial hotographs by the best known workers of the day. The lines of the Royal Photographic Society's Exhibition at the Crystal Palace, 1898, ill be followed as closely as possible. The pictures will remain on view ntil October. Mr. John Spiller is Hon. Secretary, and he may be ddressed at No. 66, Russell-square, W.C."

Commercial & Legal Intelligence.

THE well-known series of Kodak war pictures are now on view at he company's Glasgow branch, 72 and 74, Buchanan-street.

MESSRS. Fuerst Bros., of 17, Philpot-lane, E.C., have issued a new atalogue of the well-known "Axe brand" photographic chemicals.

MESSRS. James Woolley, Sons, and Co.,, Ltd., of Manchester, are ssuing a new photographic catalogue. It extends to over 150 pages, nd fully illustrates a large selection of modern photographic apparatus nd material.

THE Austin-Edwards Monthly Film Negative Competition.—The prize amera for the current month has been awarded to Mr. William A. aylor, London-street, Richmond, Christchurch, New Zealand, for his egative, "New Zealand Volunteers in Camp."

THE Thornton-Pickard Manufacturing Company have appointed Mr. . Hesketh to the vacant position of secretary to the company. Mr. Hesketh has been with the company for the last eight years and is ell-known to many dealers and amateurs.

"THE Travelling Partner."—Under this title Smith's Advertising gency, of 100, Fleet-street, are publishing a new journal of interest o advertisers. It is brightly written and full of suggestive matter to hose who utilise newspaper publicity for commercial purposes.

COLLODIO-CHLORIDE Postcards.—Wisely taking advantage of the still rowing post-card boom, Messrs. A. and M. Zimmermann, of 9 and 10, t. Mary-at-Hill, E.C., are issuing collodio-chloride P.O.P. postcards, hich are packed in dozens with two needle paper masks to sell at 1s. er packet. They are printed and toned in the same manner as collodion aper, and are stated to give good results with any separate toning and ixing baths. They are made in glossy and matt surface.

THE Little Nipper Camera.—Messrs. W. Butcher and Sons, of Blackeath, announce in connexion with the Little Nipper Camera the following competitions. It is proposed to offer, from time to time, prizes or photographs taken with the "Little Nipper Camera." The first wo competitions are open to dealers in photographic apparatus and heir assistants only. Negatives and prints must be sent in on or efore April 30. 1. One guinea will be awarded to the best set of ix negatives of general subjects taken with the "Little Nipper Camera." Negatives and a print from each to be sent in. 2. Two guineas will be awarded to the best display of "Little Nipper Cameras," either in the hop or in the window, to be photographed with the "Little Nipper Camera." Negatives and prints to be sent in. Each competitor can ubmit any number of negatives. Entries must be accompanied by the orm duly filled in, and delivered to W. Butcher and Sons, Blackheath, London, not later than April 30.

THE following is the list of awards of the Warwick competition for he current month:—£10 prize—J. A. Draycott, photographer, New-treet, Birmingham, "A Portrait." £5 prize—Miss W. Haslett, Belgravia, Belfast, "A Portrait, Lois." £1 prizes—Miss Alice Baird, Belleive, Lausanne, "Lake Geneva;" T. H. Baker, photographer, Egremont, "Sixty Fathoms Underground;" A. E. Bregmen, Karangahake, Auckland, N.Z., "Karangahake Suspension Bridge;" J. Coster, Selwyn-oad, Eastbourne, "Tobogganing;" J. Cox, 46, Almack-road, Clapton, 'Piscina, St. Albans Abbey;" J. W. Eadie, photographer, Lenidale, Airdrie, "A Portrait;" E. J. Edwards, photographer, Dolobran-road, Sparkbrook, "A Portrait;" Dr. G. Findlay, Brailes, near Banbury, "Head Study;" J. R. Gunson, The Priory, Whitehaven, "Chums;" Miss R. A. Hoare, Aylsham Vicarage, Norfolk, "The Porch," Aylsham Church;" Miss K. R. Image, St. Margaret's, Bury St. Edmunds, "Venus;" T. E. Innes, photographer, Heaton Chapel, "A Flashlight Group;" Miss M. S. Levack, Grantley-terrace, Guildford, "My Sister;" A. Morrison, Grafton-street, Glasgow, "Spring Flowers;" D. Murray, Queen-street, Wolverhampton, "A Quiet Evening;" O. W. Seville, photographer, Barclay-street, Leicester, "Leicester Races;" T. G. Snowdon, Field-street Studio, Kettering, "The Mouse Catcher;" J. Thomas, Grugos-terrace, Port Talbot, "A Spray Study;" S. Thompson, Eglinton-street, Belfast, "Copy of Picture;" F. G. Young, Alexander-road, Penzance, "Ancient Mariner."

Patent News.

THE following applications for Patents were made between April 1 and April 6, 1901:—

HALF-TONE SCREEN ADJUSTMENT.—No. 6896. "Screen Adjustment Indicator for Half-tone Photo-engraving." (Upendrakisor Ray, India.) ANDREW WYBRANT PENROSE.

SCREEN HOLDERS FOR HALF TONE.—No. 6897. "Improvements in Screen and Plate Holders for Half-tone Photographic Cameras." ANDREW WYBRANT PENROSE and WILLIAM GAMBLE.

VIEW FINDERS.—No. 6930. "Improvements in and relating to View Finders for Photographic Cameras and the like." EDWIN DREW BARTLETT and GEORGE HOUGHTON.

INTAGLIO PLATES.—No. 6962. "Improvements in the Production of Photo-engraved Intaglio Plates." DONALD CAMERON-SWAN.

DEVELOPER.—No. 7025. "A New Chemical Compound for Use as a Photographic Developing Agent and for other purposes." EDGAR STUART BARRALET and JOHN BURTON.

CAMERAS.—No. 7062. "Improvements in Photographic Cameras." MAGNUS NIÉLL.

DARK SLIDE.—No. 7068. "The 'Simple' Dark Slide." TOM PATCHETT.

CINEMATOGRAPHS.—No. 7199. "Improvements in or connected with Cinematographic Apparatus." ALFRED WRENCH.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
22	Aberdeen	Prize Slides.
22	Bradford Photo. Society	*Home-made Apparatus for Enlarging and Transparency Making.* Harry Akam and Frank Nicholson.
22	Camera Club	*Electric Radiations as Revealed by Photography.* K. J. Tarrant.
22	Doncaster	Exhibition.
23	Ashton-under-Lyne	Excursion: Chatsworth. Leader, Walter Chadwick.
23	Birmingham Photo. Society	Exhibition of Loan Collection of Pictures.
23	Newcastle-on-Tyne	*Artistic Photography.* Walter Scott.
24	Croydon Camera Club	*Photographic Facts.* Fred. O. Bynoe.
24	G.E.R. Mechanics Institution	*Scenes on the Pennsylvania Railway Road.* W. H. Rau.
24	Redhill and District	*Lantern Slide Making.* Gelatine: H. Speyer; Collodio Emulsion: A. H. Dunning.
25	Camera Club	*Variable Stars.* J. A. Formoy, F.R.A.S.
25	Darwen	Members' New Slides.
25	London and Provincial	Open Night.
25	Oldham	*Bits of Old Oldham and its History.* A. Marcroft.
25	Woolwich Photo. Society	Hand Cameras.
26	Croydon Microscopical	Canadian Slides.
26	West London	Lantern Night: *Rambles in the Engadine.* G. Lamley.
27	Croydon Microscopical	Excursion: Grove Park. Leader, W. Whitaker, F.G.S.
27	Walthamstow Photo. Society	Excursion: A City Church.

ROYAL PHOTOGRAPHIC SOCIETY.

ORDINARY Meeting.—April 16, 1901,—Mr. Thomas R. Dallmeyer, F.R.A.S., President in the chair.

GENERAL BUSINESS.

The names of four candidates for membership were read a first time, and nine candidates were balloted for and duly elected members of the Society.

THE ROYAL PATRONAGE.

The President announced that in accordance with the wishes of the Society an address of congratulation upon the King's accession to the throne had been forwarded to His Majesty, with a prayer for the continuance of the Royal patronage. He (the President) was pleased to say that a communication had just been received from His Majesty's Keeper of the Privy Purse, General Sir Dighton Probyn, intimating the King's pleasure to continue as a patron of the Society.

Affiliation.

It was announced that the following societies had been admitted to affiliation—Swansea Photographic Society, and Stonehouse Camera Club.

Mr. William Gamble, on behalf of Messrs. Penrose and Co., showed

A Spectroscopic Camera,

constructed on the lines suggested some months ago before the Society by Mr. A. A. K. Tallent. The camera is fitted with a Thorp prism grating. The apparatus consists of a rectangular box having an adjustable slit and a repeating back and dark slide at the other end. A lens, whose principal focus is at the slit, forms parallel rays which fall upon the prism grating and then upon another lens whose principal focus is at the plane of the dark slide, producing there a large and brilliant spectrum. The idea is to produce a spectroscope camera, having none of the objections of the ordinary direct vision hand spectroscope when attached to cameras, and one which shall be equally as cheap and efficient an instrument, and ready for use at any moment. The appartus is very small for the large spectrum given, and great care has been taken to avoid scattered light.

The Sampolo-Brasseur Process of Indirect Colour-photography.

Mr. Charles L. A. Brasseur, of New York, read a paper upon this process, involving the making of one negative, and from that three printings, specimens of which were exhibited in the Technical Section of the New Gallery Exhibition held by the Society last autumn. The results which were then shown on this occasion, the lecturer said were only laboratory experiments. He believed he could justly term the process the complement of all the indirect processes of colour-photography —those of Maxwell, Cros, Du Hauron, Ives, Joly, and McDonough. A single negative of the subject is required. It is made through a ruled poly-chrome screen, such as is described by Du Hauron and Joly, the specimens shown and used in this process having 531 lines per inch. Seen on the sheet by means of the lantern the lines were only barely visible even at close inspection. The negative obtained in black and white, the relative values of the colours of the object. From this negative the three intercalated negatives can be extracted, and from them prints on paper can be obtained by photo-engraving, photo-lithography, and other methods of reproduction. Positives from the negatives are apparently no different from ordinary positives, but if they be examined under a microscope it will be found that they consist of three interwoven images. Slides were projected making this fact quite clear. While one of the photographs was on the screen, Mr. Brasseur passed in front of it in the lantern an analyser ruled in black so as to cut out two lines in every three. By shifting this screen over the negative three separate times, the width of one line, the audience were enabled to see that in the one negative are three negatives, the differences of opacity corresponding with the colour values of the subject. The advantages claimed for the process are (1) that the negatives furnish prints in black and white that are very much superior to those from ordinary negatives, as the colour values are more exactly rendered. The lines, too, are so fine that they are practically invisible. (2) That the negatives serve as a permanent record of colours, and either prints on glass or paper can be made commercially. (3) That positives from the three interwoven negatives can be used for projection by means of the triple lantern, or positive can be made on glass by means of three superimposed films. (4) Positives on glass when viewed through a screen ruled in primary colours, will show the colours of the original (see Du Hauron and Joly). In the space at our disposal it is only possible to barely outline the process. The means adopted for the production of coloured images by substraction of light have considerable interest. It is absolutely necessary that the pigments must be superposed, not juxtaposed as are the colours in the screens. To do this the positive is placed in close contact with black and white analysing screen or stencil. As before described, the effect of this is to block out everything but the lines forming one colour impression. A negative is made from this, and while it is being exposed the negative plate is shifted twice each time the space of the width of one line, a suitable exposure being made between each move. The result of this is to convert a partial image occupying but one-third of the surface of the plate into one occupying the entire surface. Thus separate or independent printing surfaces, one from and for each partial image, are obtained, and from these half-tone blocks may be made and results secured in which the original lines of the colour-sceen are removed. The exposures for landscapes, under average conditions will vary from one-fifteenth to one second, for marine views one-sixtieth second, and studio exposures fifteen to thirty seconds. Mr. Brasseur showed several photographs by his process, including two of the American flags, which were considered very good performances.

Mr. Sanger Shepherd was chiefly interested in the production of a continuous tone positive out of a line negative. He referred to the method of getting colour prints from the line negatives, such as those by this process, introduced by the McDonough-Joly Co., in which the paper was first ruled in red, green, and blue lines, and upon that a half-tone block from the negative was superimposed, the impression of the later acting as a stencil, and cutting out the coloured lines or parts not required by the picture. In this there was a lack of brilliancy, however, and Mr. Brasseur's method seemed a decided advance. He was also much interested in the fine ten by eight screen shown, which he believed was the largest seen in this country for this particular work.

Mr. Brasseur in replying to some of the points raised, said that the screens were not ruled, but were made photographically. The manufacture of them was now possible, with practically no flaws.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 11,—Mr. Robert Beckett in the chair.

Mr. G. W. Atkins said that a little time ago he had faced the patent office with a little device for the attachment of the camera to the tripod, which he thought the members might consider an improvement upon the usual tripod head. The legs of the tripod are attached in the ordinary way to a metal ring which is split, and can be opened up by a wedge bolt. This split-ring is inserted into a recess in the camera base and then expanded by the wedge bolt, the grip being remarkably rigid. The ordinary screw is dispensed with altogether. Mr. Atkins showed a wooden tripod and a light aluminium tripod fitted with his new patent device. The latter tripod was not so rigid in itself as the wooden tripod, but that was due to the imperfect method of attaching the legs to the head, which was quite firmly attached with the expanding ring to the camera itself when the wedge bolt was actuated. A stereoscopic camera was shown attached to the tripod, and referring to this Mr. Atkins said it was entirely made by himself, shutter, slides, and even one of the lenses, which was an exact copy of a commercial lens, of four inches focus. The two lenses, the home made one and the commercial lens, worked splendidly together and were identical in every respect. A stereoscopic negative was passed round, and there was nothing to indicate the slightest difference between the defining power or speed of the two lenses.

Mr. S. Heskins, for Mr. J. E. Hodd, showed several pieces of apparatus, including the Clito hand camera for twelve plates, and the Sanderson hand camera fitted with the rising front introduced by Mr. Sanderson. The last camera was fitted with an "infinity" slot or stop into which the front locked for infinity work. It had the Bausch and Lomb Unicum shutter between the lenses, giving time and instantaneous exposures up to one-hundredth of a second. Three double slides and a R.R. lens were fitted to this camera. There were also the Adams stereoscopic Yale camera, a finely finished instrument with a neat device for simultaneously altering the diaphragms of the two lenses; and one of Ashford's latest stands, which, however, was suspected of being liable to vibration in a wind. Mr. Heskins also showed an apparatus for developing rollable films made by Kodak, Ltd., consisting of a dish and a wooden roller supported at either end at a suitable height above the dish. A wedge-shaped piece was cut out of the roller, allowing the insertion of the end of the film, the wedge being then pushed home and holding the end of the film tight. The roller was supported by two elastic rubber rings upon which a tension was put by revolving the roller a number of times in such a manner that the film was taken up entirely by the roller when released by the operator. The roller just dipped below the surface of the developer and so carried the whole length of the film beneath and through the solution. This device was not considered a very valuable piece of apparatus from a practical point of view. Van Hoorn's patent washer for plates and paper prints was also placed upon the table—a metal circular tank into which the water was admitted so as to produce a current in one direction, a syphon arrangement drawing off the superfluous water. A retouching desk with a means for rotating the negative in the carrier was also shown, this completing the novelties submitted by Mr. Hodd.

Mr. W. T. Wilkinson thought that the spirit level on one of the cameras was not so useful as a series of cross lines on the finders for levelling purposes.

Both the Chairman and the Secretary dissented from this view and said that cross-lines on the finder could never adequately replace the spirit level, although they might be a useful adjunct.

The Chairman thought that Mr. Atkins' expanding ring head was a step in the right direction.

The meeting joined in hearty wishes for a safe and pleasant voyage to Canada upon which Mr. Atkins is about to embark.

Mr. R. P. Drage said that he had two or three boxes of cut-films by him that had come to grief. Specimens of them were handed round, and it was seen that they had puckered up in the centre, or in other words that the edges had shrunk. The emulsion was thoroughly good, and he wished to know whether the defects could be remedied. He showed a stripped film to demonstrate that the celluloid itself was at fault.

Mr. A. Haddon suggested that if the films were placed in an atmosphere of acetone or amyl acetate for a time, the celluloid would take up a certain amount of the vapour of the solvent, and would become more or less flat again. The trouble arose through the solvent evaporating more quickly at the edges than at the centre, thereby causing uneven shrinkage. He promised to experiment with a piece of the film.

It was also suggested by others that the celluloid in the first place was not in a fit condition for coating; and, again, that the gelatine film had buckled the celluloid in the way shown.

Mr. J. W. Hodges showed four negatives, two taken with a half-plate lens of a well-known make, and the other two with an extension lens made for use with this lens. The same subject was used for the smaller and larger image, and he asked whether the definition of the negatives taken with the combination could be called good? The foci of the lens and the extension were 7½ and 11½ inches, and the stop *f*-16 in each case was used.

It was thought that the test subject was not a conclusive one, and that some plain surface should be used, such as a newspaper or fine gauze. It was pointed out that then the question of "depth" would not come in as it did in the tests shown. The construction of the lens itself and the supplementary lens was gone into in order to get at the bottom of the matter, and considerable discussion took place, chromatic aberration, curvature of field, and astigmatism being all referred to as likely to bear upon the case.

Attention was drawn to the new table-cover indulged in by the Association, and a vote of thanks was unanimously passed to Mrs. Welford for her kindness in working upon it the initials of the L. and P., and the date of its foundation.

Croydon Camera Club.—Mr. C. E. Kennett Mees lectured on Wednesday, 10th inst., upon "Organic Developers," before a large assemblage of members. The President, introducing the lecturer, stated that they had lately indulged very freely in practice, and so, by way of variety, they were to partake of a little theory that evening. "Rule of Thumb" was convenient, but rule of mind a necessary adjunct. He described Mr. Mees as an enthusiastic student of theoretical photography at University College of five years' standing, who had expended many hundreds of plates in the experiments upon which his remarks were founded. Mr. Mees, who spoke in an unusually clear and interesting way, explained the molecular basis of most of the developers in ordinary use. He defined an ideal developer, and proceeded to point out how most of the developers fell short of the requirements he outlined. He advocated as the nearest approach to what he desired a mixture of resorcin and hydroquinone. This worked slowly but surely, and without chemical fog. Its development factor was three. Mr. Mees had spent a fortnight in investigating Messrs. Hurter and Driffield's development curves for the purpose of this lecture. He fully endorsed the conclusions arrived at by the above, that the ratios of gradation are unalterable by development dodgery. A brisk discussion ensued. Mr. Salt demurred to part of Mr. Mees' contentions, as did Messrs. Kough, Willcocks, Batty, Allbright, and Glanville, while Messrs. Isaac and Maclean agreed with the lecturer. Mr. Mees' paper will appear in our next. The President congratulated Mr. Mees on his lucid handling of a difficult subject, and the assemblage awarded their youngest member a more than usually hearty vote of thanks.

North Middlesex Photographic Society.—April 15.—Mr. Child Bayley gave a lecture on "Exposure." He first gave a simple table of the relative exposures for various subjects, from clouds to very dark subjects, and said that was all they had to remember. The other factors were best obtained by means of an actinometer—Watkins' and Wynne's were recommended equally. He explained both of these instruments, and advised every photographer to have one. In dealing with exposures always double or half, do not split seconds, the difference between one second and one and a half seconds was inappreciable in development. In a competition for prints taken at the Wanstead outing, Mr. S. E. Wall was first, and Mr. J. R. Bennett second.

Southsea Photographic Society.—Tuesday, April 9, was "Visitors' Night" at the headquarters of the Southsea Photographic Society, No. 5, Pembroke-road, and there was a crowded attendance of members and their friends to witness the presentation by the Mayor of Portsmouth (Alderman A. L. Emanuel) of the medals and certificates awarded at the recent very successful exhibition promoted by the Society. After the Mayor, who was accompanied by the Mayoress, had performed his pleasant task, the Chairman (Mr. W. G. Lewis), briefly proposed a hearty vote of thanks to his Worship for his kindness in attending. In seconding, Mr. S. G. Lilley observed that the Society was certainly doing something to encourage a sense of art in Southsea, and brought forward the suggestion that the Mayor should assist in the establishment of an art gallery in the Town Hall. The vote of thanks having been duly carried, the Mayor expressed his pleasure at being present, and gave it as his opinion that it was the duty of the Chief Magistrate to encourage such a Society as this. He considered that the Southsea Photographic Society had turned out some very fine work, while, in addition, the productions of its members were strictly accurate, which was more than could be said of those of some of the illustrated papers, one of which had represented him with his hat on in the presence of the King and Queen on the occasion of their Majesties' reception at the town railway station! He also expressed himself as being distinctly in favour of the institution of the suggested art gallery, and stated that, if approached upon the matter, he would be pleased to set the machinery in motion with the object of showing the inhabitants of the town the valuable work the Society was doing. In conclusion he made a happy reference to the invaluable services of the Hon. Secretary, Mr. F. J. Mortimer, and also announced that he would be very pleased to offer a gold medal as a prize, the members of the committee to decide the nature of the competition for which it should be awarded. During the evening a large number of splendid animated and still life photographs were exhibited by Mr. L. Dyer. All the pictures were excellent examples of the high pitch to which present-day photography has attained, and the display was much appreciated.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—To professional photographers the last eight numbers of the JOURNAL should be of significant and even absorbing interest. Within the brief space of two months the latent desire for mutual co-operation has developed into an earnest expression of views which no man who respects his business connexion with photography can observe without feelings of relief and satisfaction.

To-day we may think this movement has originated in the Ogden-Lever trouble, but, deplorable as we may consider these schemes to be, there have been other influences at work to account for the active spirit of resistance now in evidence, and which union alone can make successful.

In large numbers of studios all over the country the necessity for combination has been keenly felt in the unfortunate tension resulting from the manufacturers' attitude in supplying material to professionals. For years we have been endeavouring to break down the system of obvious injustice entailed by manufacturers allowing preferential discounts to small chemists, stationers, opticians, and others, and withholding these purchasing advantages from men whose livelihood is in photography alone.

It is absurd and irritating that almost the only supplies upon which we fail to obtain trade discounts should be just those things which we should not dream of purchasing through a middleman, viz., plates and photographic papers.

In Mr. Bedding's admirable speech at Anderton's Hotel this vital question was touched upon, and the Association would earn an instant claim to strong financial support if the re-arrangement of trade and professional discounts were to be brought into a prominent position in a programme of associated action.

To be able to influence even twenty or thirty thousand pounds' worth of orders for material would mean a strong position in attacking the present unsatisfactory state of affairs, and surely this is a modest amount of support to expect from the large and important professional studios which are now established all over the country. The correspondence files of photographers furnish a pretty sure guide as to the probable attitude of some important members of the manufacturers' combine when really faced by a critical position, and even if reasonable anticipations should not be justified by events, there is always the final resource of inviting foreign competition against the British ring.

A decision of the Association to approach the outside firms cash in hand would unquestionably clinch business relationships on vastly more favourable terms than its members command at present, and, what is of great importance also, would speedily restore the good feeling between producer and purchaser which has of late suffered considerable disturbance.

It is a matter for sincere and grateful recognition that at this somewhat critical time the professional photographic world in Great Britain has the able and distinguished support of the JOURNAL, and it behoves every one to back up in whole-hearted way this splendid initiative, and the efforts of those excellent friends who have already laid the profession under a great obligation by their earnest appeals for unity and co-operation.

I shall be happy to contribute five guineas towards the initial expenses of the formation of the Association, and promise further support both in London and Hull.—I am, yours, &c., T. C. TURNER.

Regent's-terrace, Hull; 17, Upper-street, London, N.

To the EDITORS.

GENTLEMEN,—In reference to the P.P.A., I would esteem it a great favour if you will add my name to those already sent in.—Yours, &c.,

55, Thomas-street, Limerick. C. GOSTELLIA.

To the EDITORS.

GENTLEMEN,—Please add our names to list of those wishing to join the P.P.A.—We are, yours, &c., T. PRICE AND SON.

2 and 4, Peter-street, Jersey, April 10, 1901.

To the EDITORS.

GENTLEMEN,—Please place my name on the list for membership of the Professional Association, and accept my congratulations upon the success of your endeavour.—I am, yours, &c., H. U. KNIGHT.

The Studio, Cranleigh, Surrey.

To the EDITORS.

GENTLEMEN,—I am anxious to join the Professional Photographers' Association, and if you will forward this in the right direction I shall be thankful to you. I have been a photographer for 40 years.—I am, yours, &c., JAMES MILLARD.

70, Market-street, Wigan, April 10, 1901.

To the EDITORS.

GENTLEMEN,—I shall be pleased to support the P.P.A. now formed, and trust that great good will come of it. Thanking you, Sir, for what you have done in the interest of this Professional Association.—I am, yours, &c., FREDK. G. BENSON.

Westerham, Kent, April 9, 1901.

To the EDITORS.

GENTLEMEN,—Will you kindly add my name, and that of my daughter, Miss A. Clara Cooper, to the list of those willing to join the Professional Photographers' Association. I shall, personally, be very pleased to do all I can to forward the interests of the same in Birmingham and district.—I am, yours, &c., HOWARD COOPER.

19, Bearwood-road, Smethwick, Birmingham, April 10, 1901.

To the EDITORS.

GENTLEMEN,—As the Committee will have so many things to consider, I will only touch on one of the valuable suggestions you made, viz., the present action of the P.P.M.A., which hinders photographers as a body from dealing in plates and papers, and which has resulted in driving a good portion of their legitimate trade into the hands of chemists, which is a most unfair thing to do, and largely because they have already a monopoly in their own line. You are aware that this Association was started ostensibly to prevent plates and papers being sold below list-prices; but, as letters in your paper not long since have shown that where nothing of the kind has been done photographers, because they were such, were cut off from the Association list, and thus, had they been quite dependent on their trade, might have gone to the dogs. Now, I have been told by two or three makers if I would send an order for £20 worth of various my name would be brought forward to be put on the list, but I declined to be bribed in this fashion. I consider that any photographer who is prepared to pay for his purchases should be allowed to buy according to his judgment of his requirements for his customers, and if the Association continues to hinder this (I do not mind what terms, so long as they are equitable, not for me to buy at ten per cent., and the chemist twenty-five per cent., although he supplies photographs and prints for his customers), then I say all the members of the P.P.A. should combine and agree not to purchase plates or papers of any of the firms in the P.P.M.A. I could give you an illustration to prove the injustice of the present condition, and how it works harmfully to the trade, but you doubtless need it not. I feel it will be useless for the P.P.A. to be formed unless it can effectually tackle a question of this kind, amongst others. As soon as I hear I will forward the subscription that is settled upon. I very gravely question if the trade agreed to sell Kodak on condition that they would not sell other rollable films at a lower price than theirs, but what the Kodak Company would agree. What it seems to me they fear is this everlasting cutting down, which has been the ruin of other trades besides photography, and which is the bottom of the Ogden. Who would have raised a word against their competing if they were going to supply cabinets at 12s. or 15s. per dozen? I am a strong advocate for free trade, but not cutting.—I am, yours, &c.,

A COUNTRY PROFESSIONAL.

To the EDITORS.

GENTLEMEN,—It is pleasant to notice the practically unqualified approval with which the Professional Photographers' Association has been inaugurated. That there is plenty of work ahead of such an Association is evident from a perusal of Mr. Bedding's speech. It is sincerely to be hoped that the P.P.A., gaining strength by accession of numbers, will not fail to tackle some of the questions, at least, referred to by Mr. Bedding.

For the immediate present, however, the large body of photographers appear to look to some not clearly defined reform of copyright as an amelioration of the difficulties now met with. It looks very much as if the professional photographer had allowed things to slide and take their own course. He is face to face with a state of things which, in themselves, cannot well be helped—the practice of photography is universal, cameras are plentiful as sewing machines, and, worse than all from the purely professional point, the camerist is possessed of, to say the least, rather hazy notions of the morality of copyright. Even at this time of day he gives too much for nothing, and cheapens the photographic print all round.

Mr. Lyddell Sawyer writes feelingly on this matter of copyright. Still, I question whether he looks at it quite from the point of view of the average (rather low down) photographer. Mr. Sawyer is himself one of the best exponents of that personal and unique class of work, of which the late H. P. Robinson was facile princeps. The able followers of the late H. P. Robinson are far from numerous. Enthusiasm, technical skill, and unwearying effort all go to make the photographer of the genre, but these desirable qualifications are useless without the ability to originate and design; there is an immense difference between this class of work and the everyday work of the average camera man, with its constant succession of bald and uninteresting presentments. Mr. Sawyer, by the exercise of the above-mentioned acquisitions, produces a picture and claims, and rightly so, copyright in it. The average photographer of the human face can make, it seems to me, small claim of a similar nature. The normal condition of things is of the nature following: Brown goes to Jones for the purpose of having his photograph taken at the advertised price of, say, 10s. 6d. for one dozen; in due course Brown pays his money, and receives the photographs, which then become his own property; that is to say Brown is then, in the absence of any express agreement or stipulation to the contrary, at liberty to copy them, or have them copied or enlarged as the case may be, by any person he may commission for that purpose. Now, I am informed by a legal friend that this is a statement of fact decided more than once in the courts.

How is the photographer to safeguard himself? He cannot register every photograph he takes, and, if he could do so, the benefit likely to accrue is doubtful, for between himself and his sitter the position would probably be as before; but the question is, Could not something be done, or stated in one's advertisements or prospectuses, and more effectively in one's form of receipt to customer, which should definitely give to the photographer the sole right to copy and reproduce? It is clear that the photographer may have much to say in favour of his claim; the negative is a means to an end, in itself it may be a poor thing, and very unlike the finished article which has earned the approval of the sitter. Jones, when posing and lighting Brown, may have been using his great skill and experience, and Jones' retoucher and printer have added (paid for by Jones) their efforts, the nett result being a better portrait of Brown than ever before seen. Clearly Jones should not allow his interest in this to lapse for the paltry amount of 10s. 6d. Actually, the businesslike way would be for Jones to say expressly in his receipt "that the payment of half a guinea was for the proofs only, and that the right to copy or reproduce the same was withheld." But the mere retention of the negative is no advantage to Jones; he may not exhibit proofs of it without the permission of Brown. It is obviously his interest to keep on terms with his client, and so work things that future orders are likely to come in.

It is clear that some explicit agreement with the sitter must simplify this matter very considerably. In ninety-nine out of a hundred cases no trouble or dispute would arise, and the hundredth should be reduced to a mere matter of business; in other words, if Brown objects to the form of receipt, let him pay another sum of half a guinea, and hand him over the negative. If the P.P.A. would endeavour to bring about a common understanding with regard to a set of minimum charges for photographic work, portrait work in particular, amongst its members, a good beginning would be made.

Price lists are frequently worded in something like the following style:—"Cabinet portraits, first copy (say), 7s. 6d.; 3 copies, 10s. 6d.; 12 copies, 21s.," &c. If this means anything it is that the 7s. 6d. is to cover cost of the negative, and if the sitter says he has paid for the negative he is clearly not far out, but most photographers would agree that 7s. 6d. is not sufficient payment for a good negative portrait; but why not specify distinctly on one's list and receipt for what the charge is made? The Association might, with legal assistance, draw up a simple form of agreement and receipt which would tend to a better business understanding between photographer and client. This, accompanied by a printed statement on the photographic mount, to the effect that "the right of reproduction is reserved by agreement," would have a wholesome deterrent effect upon the piratical copyist.—I am, yours, &c., J. PIKE.

April 9, 1901.

[We, of course, shall be pleased to print further letters in regard to the field of work that lies in front of the Association, and hope shortly to deal with some of the many interesting points that have been raised in the course of this discussion. But on the question of membership, financial support, and other business details, will our many correspondents note that the Hon. Treasurer of the Association is Mr. William Grove, 63a, Baker-street; and the Hon. Secretary, Mr. Alfred Ellis, 51, Baker-street, London, W.—EDS. *B. J. P.*]

"THE COPYRIGHT UNION."

To the EDITORS.

GENTLEMEN,—I read with interest Mr. Sawyer's letter in your issue of March 29, in which he presses the need for photographers "Joining the Union," and thus strengthening its hands in looking after the interests of photographers generally touching the copyright question. I quite agree with him on the importance of this, but perhaps he is not aware that very many photographers have perforce not

ned the Union because of its stringent rule to make the minimum for reproduction of a copyright photograph 10s. 6d. I was one of se who joined the Union at its start, and adhered to this rule, to my loss financially, because I found that while I was adhering the rule others outside the Union were granting the right to re-duce at a lower figure. While I am no advocate for cutting ces, I think that the price to be charged for such reproductions st be left largely to the circumstances of the case. A few months ce a publisher wrote me for terms for reproduction. Not knowing w many he would require, I replied the usual fee was 10s. 6d., which, would probably know, was considered a fair charge by the Copy-ht Union. He replied, "We cannot afford price you name. I can t nearly as many required from 2s. 6d. to 5s., and from good photo-aphers. The Association you name we only go to members of when cannot get our own man to do them, or cannot get what we want ewhere, and that is very rare indeed. I buy hundreds of photos in year, do best I can for myself, mind my own business, and not lk to any one at what price I pay for same." Mr. Sawyer might ink this exceptional. I was disposed not to trouble you with any rrespondence on it, but to-day brings me a letter from one of the gest publishing houses in the kingdom, and they say:—" . . We y 5s. each for the right of reproduction, price to include two good mounted prints." My only object in writing this is to show that a Union is formed for a specific purpose, viz., to watch Parlia-entary procedure re copyright, it ought to leave its members free transact their own business in the way they deem best. There are rtain subjects which a payment of 5s. to reproduce is ample, but hers are worth £5. Who ought to be the judge? I think the man ho holds the copyright, but if the Union makes a hard-and-fast le that the minimum fee for each in all cases shall be 10s. 6d., then excludes those who prefer to be free rather than accept a rule d not adhere to it. I ceased to be a member when I found there as no inclination to alter it, but should join again and subscribe ereto if it confined itself to the business for which it was formed, d left its members free to attend to their business.—I am, yours, &c.,

April 9, 1901. PROFESSIONAL.

PHOTOGRAPHY AND THE FOURTH COMMANDMENT.

To the EDITORS.

GENTLEMEN,—Your correspondent "J. H. W." is very much in error hen he says I "cannot produce any scriptural authority" for six ys-a-week business and work. The Fourth Commandment is ample r all who believe in God and His Almighty and Everlasting Word; show "J. H. W." how scripture deals with Sunday workers I ould refer him to Ex. xxxi. 14-17, where we read that in those ys, when law-breaking needed severe punishment, God ordained that hoever broke His Command (the Fourth Commandment) should be t off from his people and put to death. We see that God con-ders Sabbath-breaking a very serious offence. God always pro-ides for the seventh day (the Sabbath), for He commanded the raelites in the wilderness to gather manna sufficient on the sixth ay for the seventh also.

Looked at from a religious point of view, there is no excuse and o necessity to break the Sabbath; looked at from a secular point of iew, seven days-a-week work is utter folly, for it resembles running achinery without oil to lubricate; looked at from an unselfish and ational point of view seven-days-a-week employers ought to be rought to common-sense by boycott. If "J. H. W." cares to corre-pond privately, I shall be pleased to show him amplest scripture uthority for my protest, which space does not allow here.

"SIX DAYS A WEEK."

THE PHOTOGRAPHIC COPYRIGHT UNION.

To the EDITORS.

GENTLEMEN,—Presuming that the following two copyright cases nay be of interest to photographers generally, I trust you may find pace to publish the same. The first case was of the cheap enlarge-ent kind, where a copyright photograph of my own was enlarged nd sold. Without having any negotiations either by writing or seeing he offending parties, I referred the matter to the Copyright Union. This was, I believe, at the commencement of June, 1899, and about he middle of July I received my reply to the effect that it was not case the Union could take up, but I should be justified in making a laim for breach of copyright. The second case was as follows:—A local newspaper issued a supplement at Christmas which consisted f one large sheet with local information, photographs of prominent nen in the centre, and advertisements around the reading matter. One of the photographs was a copyright of my own, for the use of which neither permission had been asked or pay offered by the pub-ishers. I wrote the firm a letter, in reply to which a representative rom them called upon me. We had a conversation "without pre-udice," and they offered a less sum to settle the matter than the Copyright Union rules allow a member to charge. I refused it, and asked a certain amount, which was refused me. This, in my innocence, I thought a case which would interest the mighty Committee of the Union, whose rule No. II. distinctly states that "The object of the Union shall be to secure and Protect (a capital P, please) photographic copyrights, to suppress piracies, and generally to promote the interest of the profession." How beautiful and sublime it reads, and yet my case had no interest for the Committee of the Union, as, in trying to settle the matter myself, I had grievously offended the Union, they being of the opinion that upon finding "I could not carry it through," I had had the audacity to appeal to them, as if a member had the least right to expect that great Committee to take up a case where the said member had commenced negotiations, though said negotiations left the matter entirely open. I wrote to the Union about the middle of January, and it took the Committee a month to decide it was not a case they could take up for above reason. With the help of a local solicitor the case was quickly settled to my satisfaction.

The proposed new Professional Society may congratulate themselves that the leading photographers have kept aloof from the movement, if the above cases are a sample of their work, as I believe the Union Committee is composed of leading photographers.—I am, yours, &c.,

11, Knowsley-street, Bolton, April 12, 1901. A. WEBER.

THE POISONS ACT.

To the EDITORS.

GENTLEMEN,—The letters appearing in your last two issues anent the sale of poisons do not for one moment attempt to solve this question. The writers, evidently members of the Pharmaceutical Association, are solely anxious for their own sakes to keep up this monopoly. Let the new professional organization make a strong endeavour to get the existing law altered so that we can buy our poisons at fair prices, without being made to pay the seller for his fees to the Pharmaceutical Association to let him trade. What is wanted is a simple licence, costing, say, 5s. a year, to be granted to all and sundry who can satisfy a simple examination in poisons—the examination to be under direct Government control, and the licence revokable on conviction of misuse or malpractices by the holder.—I am, yours, &c.,

FAIR TRADE.

THE SALE OF POISONS.

To the EDITORS.

GENTLEMEN,—Permit me to answer the letter of "Chemist" in your issue of 5th inst. Apparently "Chemist" has not heard of the Traders in Poisons or Poisonous Compounds for Technical or Trade Purposes Protection Society, or of the proposed Trade Poisons Bill. If he will write to me I shall be happy to supply him with the information he needs, and also a copy of our draft Bill.

Having carefully perused "Chemist's" letter, I can only find one point calling for a reply from me—his abuse of yourselves may be passed over—namely, his statement that the present restrictions on the sale of poisons are for the safety of the public.

The framers of the Pharmacy Act, 1868 (under which statute the Pharmaceutical Society is now carrying on a crusade against photographic dealers by means of vexatious prosecutions) never contemplated conferring a monopoly in favour of the chemist and druggist of the sole right to retail the articles containing poisons now so largely used in photography.

Thirty years ago photography was not what it is to-day; and I have yet to learn that the chemist claims it is he who has raised photography to its present high scientific and commercial position. Why, then, should he continue to claim the existing monopoly? The safety of the public is his answer. But the time has arrived to combat and overthrow the unjustifiable claim of the chemist and druggist to this monopoly, and also to have removed the unwarrantable restrictions now existing.

The Society I represent was formed for this specific object. There will shortly be introduced into Parliament a Bill making it lawful for all dealers (including chemists and druggists) to sell poisons and poisonous compounds where the same are sold for agricultural, horticultural, disinfecting, photographic, and numerous other trade and technical purposes, under certain restrictions, among which are that the person or firm selling shall be registered and pay certain duties; that such poisons are not to be sold for therapeutic or medicinal use, or for the preparation of medicines; shall be only sold in closed vessels or packages, and where the seller is not the manufacturer in the original packages as received from the manufacturer without breaking bulk.

This Bill, of which the above is merely an outline, has been very carefully drawn, and absolutely meets the old, old cry of "the safety of the public." Let the shoemaker stick to his last, the chemist to his compounding and dispensing of medicines, and leave to the general dealer, be he agricultural agent, seedsman, florist, ironmonger, hardwareman, oil and colourman, or photographic dealer, who shall comply with the provisions of the proposed Trade Poisons Bill in the retailing of such articles as sheep-dips, weed-killers, insecticides, disinfectants, paints, photographic chemicals and compounds, or the

thousand and one articles in general use to-day, which, by an out-of-date Act of Parliament, may only be lawfully sold by a chemist.—I am, yours, &c., THOS. G. DOBBS, Secretary.

The Traders in Poisons or Poisonous Compounds for Technical or Trade Purposes Protection Society. Offices: 5, Clement's-inn, Strand, London, W.C., April 10, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. W. Sargent, 12, Albany-road, Cardiff. *Photograph of S. Jenkins.*

G. W. Gibson, High-street, Coldstream. *Photograph of room in Ford Castle.*

A. S.—See the first paragraph of "Ex Cathedrâ" in this week's JOURNAL.

M. O. F.—Both Messrs. O. Sichel and Co., of Bunhill-row, E.C., and George Houghton and Sons, 89, High Holborn, W.C., supply self-toning papers. We have used both successfully. Either will answer your requirements.

THE CITY AND GUILDS EXAMINATIONS.—"INQUIRER" writes: "Would you oblige me by letting me know where I could get the questions and answers for the last ten years set by the 'City and Guilds of London Institute,' for examinations in photography?"—In reply: They are contained in a volume published by Messrs. Whittaker, Paternoster-square, E.C. Price, we believe, Tenpence.

WATCH-COVER PHOTOGRAPHS.—"CALLANT" writes: "I have seen photographs in the inside of a watch cover (on the metal surface). Can you tell me how the same are done?"—In reply: Without seeing an example we cannot say. They may be fixed in on enamel, or they may be on paper, similar to the bromide or collotype prints that were so popular, as "war buttons," last year. If you send us an example we shall probably be able to assist you.

BOOKS ON PRINTING.—"PRINTER" asks: "Could you kindly recommend me the best book on Photographic Printing?"—In reply: We do not know of any very recent work devoted entirely to printing, dealing, up-to-date, with modern papers. All photographic manuals treat upon the subject. The Paget Plate Company, and others, issue pamphlets dealing with their papers. We should advise you to get them, and from them you will gain much practical information, if not theoretical knowledge.

RETOUCHING.—"VELOX" asks: "When a retoucher is working upon a negative, how can he make certain portions appear darker when the photograph is printed? I mean to obtain the opposite effect to that which is the work of a retouching pencil, which appears lighter in the printed picture."—In reply: By the use of the knife—that is scraping or cutting away the film where it is desired that it should print darker. Special knives for the purpose are sold by all dealers, or a penknife may be used.

LENS QUERY.—"LEONIDAS" writes: "I have a R.R. lens, half-plate of nine inches focus. Could I obtain a lens to place in front to make focus six inches without sacrificing the rapidity? If so, will you please tell me where I can get it, and about how much?"—In reply: You could obtain a lens that would shorten the focus of the R.R., but if there is a well-corrected lens any addition to it will, to an extent, impair those corrections, and probably a smaller stop will be required to get fine definition. Messrs. Griffin and Sons supply supplementary lenses. Write to them for prices. Would it not be better in the end to get a six-inch focus lens?

VALUING A BUSINESS.—P. and R. writes: (1) Could you give us the name and address of some good valuer of a photographic business (as we contemplate taking one over), some local man preferred? (2) If not, perhaps you could give us some idea as to the value of portrait negatives, also the value of a turnover of £300?"—In reply: (1) We can only refer you to the advertisement columns. Any of the agents who advertise in them would value the business. We do not know of any in your immediate neighbourhood. (2) We are sorry we cannot, as the value depends upon so many things—such as, who the portraits are of, the prices charged, the rent of premises, &c.

TONING.—"A SUBSCRIBER" writes: "I enclose two prints which a bad colour. I should be greatly obliged if you would inform what the cause is. Do you think it is caused by insuffic washing before toning, or too much sulpho-cyanide in to bath? They appeared to tone nicely, but when put into fi bath they turned this nasty colour, and some worse. I sh esteem it a kind favour if you could guide me out of this difficul —In reply: The prints are certainly not a pleasing colour, as no data are given as to the paper used, or the composition the toning bath—proportion of sulpho-cyanide to gold, &c.— can give no definite opinion. Why not try washing more using less of the sulpho-cyanide?—that would satisfactorily ans the query you put to us.

BORAX TONING.—W. P. ADAMS writes: "Some years ago I used a bo toning solution with great success for P.O.P. I believe it peared in one of your issues, or the ALMANAC, and I should greatly obliged if you could put me in the way of finding it, I cannot get good results with the ammonium sulpho-cyan solution recommended by the makers, and never have been a to, although I have the advantage of a fifteen years' experie in photography, and a thorough training in chemistry."—In rep A borax toning bath is given on page 1060 of the ALMANAC. this bath is seldom used for gelatine papers, as it does not yi good tones with all of them. The sulpho-cyanide is the that is most universally employed and we cannot understa why you should not be successful with it.

THE ALUM BATH.—COL. GUBBINS asks: "Is alum (the alum bath) u after adurol likely to produce stains? I believe that it is af quinol. On Monday I developed four (Wellington) films w adurol; on Wednesday five. The latter seemed all right until th were drying, when they turned white, and on stripping from t glass both negatives and glasses had a white powder on the I have tried washing the negatives again, they seem all right wh wet, but come out as before when dry. What puzzles me is th both lots were developed, alumed and fixed with solutions out the same stock bottles. There does not seem to be much am with the negatives by transmitted light."—In reply: We ha not found the alum to cause stains. In all probability the seco lot were not quite so carefully washed between the operatio as the first were. We think that you will find that the sour of the trouble.

VARIOUS QUERIES.—"AU FAIT" writes: "(1) Is there a firm or firm that buy up chippings of P.O.P. untoned, or waste P.O.P., &c. If so, kindly give me the address of same. (2) Can you recom mend Maloni's flashlight? Is it a good one for large groups ar indoor work, parties, stage plays, &c.? (3) Can you give m information as to the making of a changing-bag, or where can get one recommended?"—In reply: (1) Any refiner will receiv the cuttings and recover the silver from them for you, and rem their value. We do not know of any firm that will buy the without knowing the quantity of silver they may contain. (We have seen some very good pictures that were taken with i and it is successfully used by many photographers. (3) Severa different forms have been described in the ALMANACS, and in bac volumes of the JOURNALS. Most workers construct them fro their own design. All dealers supply changing-bags however.

VIEW-FINDERS, &c.—M. D. writes: (1) May I ask your kind assistance I am using a ten by twelve field camera, I desire to fix a view finder (or something else) that will give me the exact position the view on the plate. I desire to be able to take yachts racin and to know how they are on the plate. Could the same arrange ment be made so as to show whether they are in focus? use a twelve by ten Cooke lens. (2) I desire also to know th quickest way, with the best results, for printing same, as it of the utmost importance to have them out of hand quick and cheap and to look A 1?"—In reply: (1) Yes, it may b done, and the method is described in Taylor's "Optics of Photo graphy," pages 172-176, but space is too limited in this column t repeat it. A finder of the ordinary type, but on a larger scale would probably answer your purpose if it were accurately adjusted on the camera—though, of course, not for focussing. (2) Bromide paper.

STUDIO GLAZING.—"WELSHMAN" writes: "Would you kindly advise me on the questions below? (1) Would a studio with glass facing east require frosted glass to keep sun's rays out? (2) At what angle should glass in roof be placed so as to miss as much sun as possible? (3) What colour curtain or blinds would you advise for studio where sun is sure to strike? (4) Is a studio so situated much harder to work than if constructed so as to face north? (5) What colour would be best to paint interior of studio?"—In reply: (1) No, as you will only have the sun on in the morning. (2) Any angle of the roof will not miss the sun as it must be on the roof, when shining, up to about mid-day. (3) Light green or dark blue—either will be good. (4) Slightly more in the early morning. (5) Any unobtrusive colour. A French grey will be a good one. If the sun is found troublesome on the roof you might have some tissue, or tracing, paper on light wooden frames, hinged to the roof, to be used, when necessary, to subdue it.

*** Many answers to correspondents, letters, reviews, and other matter, are unavoidably held over.

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EX CATHEDRÂ.

nthetical digo. At the meeting of the Society of Arts, last week, Prof. R. Meldola read a paper on "The nthesis of Indigo." The manufacture of artificial indigo now being carried on by a firm in Germany on a very large ale, and it is said that tens of thousands of pounds have en expended on perfecting the method of making it. digo, as a dye stuff, is reckoned one of the most permanent dyes; will the artificially produced article prove equally stable? One cannot easily conceive why it should not , as other synthetically produced dyes have proved as per-anent as those obtained from natural sources have done—izarine, to wit. It is noteworthy, however, that the Ger-an Government have withheld its use for the army and vy until its stability, as compared with the natural pro-ict, has been better established. Some two years or so o we were shown a sample of this artificial indigo, and a ry beautiful colour it was. Whether it is as stable, when ng exposed to light, as the natural product or not, it is rtain to have a very marked effect on the indigo-growing districts of India. Indigo is largely employed, as a pigment, in the manufacture of carbon tissue where the purple tint is required, and it has usually been looked upon as a permanent pigment, though it may be mentioned the late Dr. Monckhoven controverted this idea when the indigo was used in carbon tissue, but there is indigo and indigo. In the manufacture of carbon tissue it has been found that the artificial alizarine, used with indigo to give the purple colours, is quite as stable as that produced from madder, and there is no reason that we can at present see why the artificial indigo should be less permanent. We should, however, recommend English manufacturers of carbon tissue not to adopt it until they have thoroughly satisfied themselves as to its stability under the prolonged action of light. The carbon process is credited with being one of undoubted permanence, and it would be regrettable if its credit should be shaken by the introduction of a pigment of doubtful stability.

* * *

The Poisons Act and Poisons. The Registrar-General's Report for 1899, recently issued, shows that during that year there were no less than 1159 deaths from poison. But this number includes not only poisons that are used for technical and medicinal purposes, but such things as coal gas, poisonous fish, mushrooms, unsound food, ptomaines, &c. The largest number of deaths from any one substance is that from carbolic acid, 212. This is now scheduled as a poison, and we shall have to wait for a couple of years before we learn if there are fewer deaths from it since the pharmaceutical chemists have secured a monopoly in its sale. Our esteemed contemporary, the "British and Colonial Druggist," in commenting on the report, and the restriction on the sale of carbolic acid to chemists, says the public suffer no inconvenience because they cannot purchase it of the oilman and the huckster, and adds: "In these circumstances it is to be hoped that nitric, hydrochloric, and sulphuric acids, as well as certain other dangerous substances, will also be ere long placed in the poison schedule, a proceeding which would conduce to the public safety." This remark clearly

justifies the formation of the Traders in Poisons (used for trade and technical purposes) Protection Society. If the three acids named, which are so largely used for trade and technical purposes, were scheduled, one would, of course, have to purchase them at the "qualified pharmaceutical chemists'," who would then have the monopoly in their sale, and pay any price that the vendors might elect to charge for them. The deaths for the year from these unscheduled and extensively used acids combined were 70; while those from the scheduled poisons, opium, laudanum, and morphine, which are not used for trade or technical purposes, and can only be purchased at the "qualified chemist's," amounted to 155, considerably more than double those from the acids our contemporary would have scheduled. Again, prussic acid, oil of almonds, and cyanide of potassium, which are only to be had from the chemist, caused 54 deaths. Strychnine and nux-vomica, others of the scheduled poisons, were accountable for 26 deaths, and vermin-killer, which can only be vended by the "qualified," caused ten deaths, while weed-killer, so largely used by horticulturists, was only accountable for one death. Another scheduled poison, oxalic acid, caused 45 deaths during the year. The Registrar-General's report shows that there were considerably over 400 deaths from scheduled poisons. Last week, it will be remembered, we expressed regret that the Dublin cases were not contested as regards oxalate of potash being a poison within the Act, if it could be classed as a poison at all. It is not scheduled in the Irish Poisons Act of 1870, hence our doubts. Through the courtesy of the Editor of the "Chemist and Druggist," we now learn that the oxalates were scheduled as poisons by an Order in Council in 1897, at the same time that carbolic acid, biniodide of mercury, &c., were added to the Irish Act. The Irish and the English Poisons Acts are not quite the same, and the oxalates are certainly not mentioned in the English Act of 1868, and, so far as we are aware, they have not been added by any Order in Council since. Now, although oxalate of potash is so largely used in photography for one purpose or another, it is noteworthy that the Registrar-General's Report does not show a single fatality from it.

* * *

The Expression in the Human Mouth. Though we are no advocates of excessive or pernicious retouching, we are well aware that the portrait photographer has to make use of it if he is to please his clients. The less the better, but when retouching is attempted it needs to be done with discretion, and, above all, with knowledge. We do not hesitate to say that any retoucher who would make a study of Darwin's "Expression of the Emotions in Man and Animals" would find it of immense value, and further knowledge, which means power to impart the best effect with the least labour and departure from the original, would be gained by studying also Bell's "Anatomy of Expression." We see so many photographs of faces with most laboured retouching, upon which far better results could have been obtained by one-tenth of the amount of work if informed by knowledge and study. Our attention has been drawn in this direction by some interesting remarks by Mr. George Frost in the "Leeds Mercury" We think it will be well worth while reproducing from them Mr. Frost's dicta upon the mouth, as they contain criticisms upon this feature which may be rea with advantage by any one desiring to have as great a knov ledge as possible upon this feature as an aid to retouchin Mr. Frost writes as follows:—"The projection of the upp lip over the lower tells of a sentimental disposition; if bot lips advance equally we have a loyal mouth; while a marke projection of the lower lip shows firmness, if not actu obstinacy. A thick under-lip appreciates the pleasures the table. If the lip is merely full, well coloured, an developed at the corners, the nature is benevolent. Th long under-lip records some degree of coarseness or co tempt for conventionality. If it is bowed, it gives the gi of the gab. Thin compressed lips belong to a cold natur and lead us to suspect temper, a possibility of cruelty an selfishness tending to avarice. If the lips turn down we hav a tendency to depression. A buoyant optimistic mout curves upwards. A level mouth, with well-developed li which close sweetly and firmly and part equally, revealin the teeth, not the gums, belongs to a trustworthy person an promises sincerity."

* * *

The Teaching of Optics. We have recently expressed our views upo the lamentable absence of any elementa knowledge of optics displayed by so many photographer both learners and experienced. In some cases, of cours this may be attributed to a want of special culture at th outset of a photographic career; in others it is difficult t offer an excuse. Where the mind has no special math matical bent, it is, no doubt, difficult for a teacher to impa even the rudiments of optics, and it is so difficult to for into some minds even with adequate blackboard illustratio such simple matters as the relations of conjugate foci an the like. Mr. George E. Cory, Lecturer in Chemistry an Physics at St. Andrew's College, Grahamstown, Sout Africa, aware of this difficulty, has devised a very ingenio apparatus for exhibiting the method of the formation of a image by convex lenses, together with the changes in siz position, and nature of the images which are produce just the points upon which knowledge is desirable in pho graphic directions. A teacher by means of this instrume can, in a short time, do more descriptive work than many laborious black-board illustrations, and we are gl to find that the manufacture of the little apparatus being taken up in this country, and that it is now on sale

HYPO AND ITS MORE RECENT FORMS.

In referring to "recent forms" we do not allude to i nomenclature. We suppose every one nowadays is awa that the salt variously known, popularly, as hypo by th photographer, and anti-chlor by the paper-maker, and on known to chemists as hypo-sulphite of soda, is more co rectly under modern chemical ideas spoken of as sodiu thiosulphate: we are dealing more particularly with th salt from a mechanical aspect. A few years ago the onl way in which, virtually, hypo was known to practical phot graphers was in the form of large crystals, varying in si from that of a hazel nut to masses of perhaps a quarter of pound in weight. In fact, this particular crystal len

elf to a great variety of shapes. We well remember see- g in the museum of a large manufacturer of hypo a double ystal shaped like a square snuff-box, with a lid to match. ıe objection to large crystals of any kind is twofold. In e first place, they are apt to imprison considerable quan- ies of mother liquor in their interstices, and so prevent eir assuming the desired condition of purity, which re- ystallisation is expected to bring about, and, secondly, ge crystals are less readily dissolved than smaller ones. ost probably the latter cause has been operative in in- cing the makers of this particular crystal during the last v years to place upon the market a crystal about the size a pea—such crystals, hence, often being termed pea ystals. In every way they are a great improvement: it easier to make a nice shaped solid crystal with no mother uor imprisoned; when this small size is adopted they much more readily dissolved than the large sses or accretions of crystalline form so long in vogue. a crystals had not been long in use when a further im- ovement—improvement, at any rate, in one direction— s made; the crystals were still smaller, being, in fact, e caster sugar or salt. They could be thrown into water l dissolved almost instantly, a very great convenience to ose especially who make up their fixing solu- ns as they needed them, and not in large quantities at ce. For the latter purpose, indeed, the larger crystals e better, a simple plan being to place a couple of stout s a little below the level of the top of the vat, and then, er putting in the requisite quantity of water (its surface ng a few inches above these bars), to place on them a ndredweight cask of crystals with a few auger-holes bored the bottom of the sides. The dissolution is then auto- tic; in a short time all are dissolved, and, the cask being noved, a wooden stirrer will quickly equalise the strength the solution. For this purpose we repeat, the larger stals are best. It is desirable that stock hypo solution not exposed too freely to air, as it is apt to absorb oxygen, l so become weaker (indeed in closed vessels it will nge). Such absorption, however, is but slow. It has n supposed by some, on the strength of a somewhat biguously worded paragraph in the first edition of tts' "Dictionary of Chemistry," that the crystals them- ves absorb oxygen. Such, however, is not the case. The tence runs: "In contact with the air it is gradually completely oxidised to sulphate." But a fair study of context will show that the solution only is referred to. Returning now to the small crystals, it may be said t when very small in size there is less reason to expect nplete purity, owing to the surface mother liquors. Of rse, we are aware that to obviate this drawback, crystals washed by saturated solutions of pure crystals to free m from this surface impurity, but the low price at which po is sold (though now, like everything else, it is "up") uld make us dubious as to this plan being generally pted with it. We believe that the hypo granulated in s manner was first produced for commerce in the Con- ental works, though now it is common in this country. is, we consider, a distinct gain, for English hypo, as far an extended observation on our part goes, is a praise- rthy example of purity in a commercial product. We ve never come across a sample containing large quan- es of sulphate, but we have seen German hypo which s been full of a white floury appearance when a cask has been left opened and untouched for a week or two, the appearance being, doubtless, due to the admixture, purposely, or otherwise, of large quantities of sulphate of soda, which, at ordinary temperatures, gives off its water of crystallisation, and as it becomes anhydrous, becomes at the same time as white as flour, the crystals, carefully handled, still preserving their form. We have spoken of the crystals being granulated, and there can be no doubt that the expression is the correct one to use. Yet, strange to say, if "granulated hypo" be ordered from the manufacturer he will supply, not granulated crystals, but those of a larger size, more approximating the pea-crystals, and not in any respect entitled to the appellation "granular."

There has lately arisen what we can only term a fad in respect to salts usually employed in crystals, we refer to driving off the combining waters, and using them in the anhydrous form. For packing purposes in small quantities, and for portability with a suitable supply of acid to make acid hypo, so useful with some forms of bromide paper, anhydrous hypo does well, but for ordinary employment it possesses no advantage. Further, the labour of dehydrating it is expensive, and in consequence a higher price has to be paid. Higher that is in proportion, for it must be remembered that as hypo crystallises with five equivalents of water it will, when the water is driven off, lose about thirty-two per cent. in weight, so that a hundredweight of anhydrous hypo is equivalent to about a hundredweight and a half of the ordinary kind. It will thus be seen that modern hypo may vary in important mechanical respects from the old kind, and that some samples of it may possess advantages of purity and convenience over the older makes of this familiar salt.

NOTES ON THE FOCAL-PLANE SHUTTER.

The advance made of late years in the manufacture of rapid plates has given to the focal-plane shutter a prominent place amongst the various items that constitute the photographer's outfit; and in some cases it becomes quite an indispensable appliance; for no other form of shutter will give a very rapid exposure in so reliable a manner.

Although it is, perhaps, the easiest of all shutters to analyse, the principles of its action do not appear to be generally understood.

A recent number of a photographic paper contained a photograph, taken with a focal-plane shutter, representing a trotting horse with all four feet simultaneously off the ground; and this picture led to a rather lengthy discussion, which however, left the question pretty much where it began.

It was confidently asserted by some that the attitude of the horse was an impossible one, due to the distorting effect of the shutter; and it was even suggested that the picture was "meant as a joke," though very naturally there were others who failed to see where the "joke" came in.

That the focal-plane shutter does, under certain circumstances, distort the image, is, of course, obvious enough; and for this reason it has sometimes received a kind of wholesale condemnation which it certainly does not deserve.

In the case, for instance, of a man running; if the blind is made to travel at right angles to the direction of his movement, the image receives the exposure, so to say, by instalments; the effect of which is that if a man were holding himself in an upright position, his image on the plate would represent him leaning either backwards or forwards, according as the exposure commenced with his head or his heels.

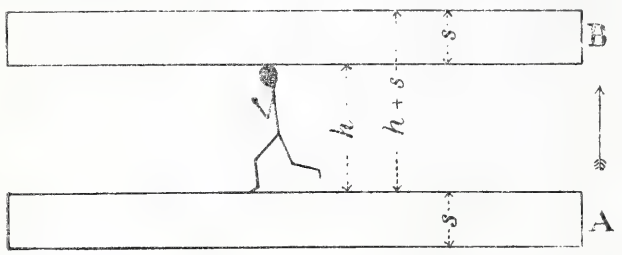
It is, however, equally obvious that if the blind travels in a direction parallel to the man's movement, there would be no

appreciable distortion when the exposure is rapid; and we have here a satisfactory explanation of the picture referred to above, where, presumably, the blind travelled vertically, thus enabling the four feet of the horse to be included in the width of the slit for the period of the exposure.

Knowing, then, that the shutter is liable to give a distorted image, it may be useful to examine the matter a little closer, and to ascertain to what extent the distortion may go in an unfavourable case; *e.g.*, when an object of some appreciable height, such as a man, moves at right angles to the axis of the lens and to the direction of the motion of the blind.

The general features of the focal-plane shutter are so well known that it is unnecessary to enter here into any details as to its construction, and it will be sufficient for the present purpose merely to consider the action of a comparatively narrow slit passing with a *uniform* motion across, and as close as possible to, the surface of the plate.

In the following figure, let h^1 be the height of the image on the plate; A and B the two positions of the slit immediately before and after the exposure of the image; and s the width of the slit. It is



evident that in travelling from A to B the slit moves through the space h^1+s.

Let

T_1 = the time occupied by the slit in travelling the distance h^1+s.

and

T_2 = the time occupied by the slit in travelling the distance s.

then

$$\frac{T_1}{T_2}=\frac{h^1+s}{s}$$

$$\therefore\ T_1=T_2\left(\frac{h^1+s}{s}\right)\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

It is important to note clearly the difference between T_1 and T_2. The first (T_1) is the period during which light is admitted to the image as a whole, or, as it may be called, the *actual exposure;* whilst T_2 is the *effective exposure*, or briefly "the exposure"; *i.e.*, the exposure given to every individual point in the surface of the image, whatever may be its dimensions.

To fix one's ideas on this matter, suppose :—

$s=\frac{1}{4}$ inch
$h^1=1$,,
$T_2=\frac{1}{500}$ second;

then, inserting these values in eq. 1, we have :—

$$T_1=\tfrac{1}{500}\left(\frac{1\frac{1}{4}}{\frac{1}{4}}\right)=\tfrac{1}{100}\text{ second},$$

that is to say, it takes the shutter $\frac{1}{100}$ second to give to every point of the image an exposure of $\frac{1}{500}$ second.

We therefore correctly express what has taken place by saying that the image has "received an exposure of $\frac{1}{500}$ second," notwithstanding the fact that it was actually exposed (*i.e.*, some part of it was exposed) to the light for a much longer period. Failure to understand this particular point has led to some amusing blunders in defining the exposure given by a focal-plane shutter.

The "exposure" proper (and the only one that conveys any meaning if the width of the slit and the height of the image are not stated) is therefore the time that the blind takes to travel the width of the slit, and in what follows it will be denoted by the letter e instead of T_2 as previously.

Various suggestions have from time to time been made as to the best means of ascertaining the amount of distortion, such as photographing the cardboard image of a man, a rolling hoop, and so on. Experiments of this kind have been recorded, but, curiously enough, in those which the writer has met with, no mention is made of the speed of the shutter, the width of the slit, the dimensions and velocity of the object, its distance from the lens, and the focal length of the latter, without which data the experiment merely confirms a fact already obvious.

The following method gives, in the writer's opinion, a better idea of what the distortion may amount to in any particular case :—

Let

f = the focal length of the lens.
h = the height of the object.
c = the distance of the object from the lens.
v = the velocity of the object.
e = the exposure.
s = the width of the slit.
d = the distortion (*i.e.*, the horizontal displacement of the image from the vertical).

[The object here taken is a man moving at right angles to the motion of the blind.]

Since the man is moving at the rate v, his image will move at the rate

$$v^1=\frac{fv}{c}$$

so that, during the period T_1 his image will move through the space

$$d=T_1v^1=e\left(\frac{h^1+s}{s}\right)\frac{fv}{c}$$

But,

$$h^1=\frac{fh}{c}$$

$$\therefore\ d=\frac{fve}{c}\left[1+\frac{fh}{cs}\right]\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

This equation gives the distortion, *i.e.*, the horizontal distance that the image of the man's head will be in advance of (or behind) its correct position; in other words, d is the tangent of the inclination of his image from the vertical.

To apply eq. 2 to a practical case: suppose it is required to photograph a man seventy inches in height, running a speed of 350 inches per second, at a distance of 560 inches from the camera, with a eight-inch lens, an exposure of $\frac{1}{500}$ second, the slit of the blind being a quarter of an inch wide. Tabulating these figures,

$h=$ 70 inches,
$v=350$,, per second,
$c=560$,,
$f=$ 8 ,,
$e=\frac{1}{500}$ second,
$s=\frac{1}{4}$ inch.

Inserting these values in eq. 2, we have :—

$$d=\frac{8\times350}{500\times560}\left[1+\frac{8\times70\times4}{560}\right]=\cdot05\text{ inch.}$$

The height of the man's image on the plate is

$$h^1=\frac{fh}{c}=\frac{8\times70}{560}=1\text{ inch},$$

so that if he were holding himself upright, his image would represent him leaning at an inclination of ·05, or rather less than 3° from the vertical, which is not a very serious distortion in a case of this kind. The example given represents, in some ways, quite an extreme case, and is precisely one where the blind should be made to travel parallel to the man's course. The speed (350 inches per second) is almost record running; the distance, c, is, as will be seen later on, as small as is permissible; and eq. 2 assumes that exposure goes on for the full period T_1, which is only theoretically exact. The man is running at right-angles to the axis of the lens, but, if taken at an acute angle, the distortion would be less. Then, again, a wider slit would also reduce the distortion. For instance, if we make the slit half an inch wide

hich would, of course, require the speed of the blind to be doubled) . 2 gives:

$$d = \cdot 03 \text{ inch.}$$

d the image would lean only about $1\frac{3}{4}$ degrees from the vertical.

In connexion with this subject the distance c at which to operate an important matter, owing the necessity of limiting the amount the blur due to the movement of the object.

If b is the permissible blur, the camera should not be brought arer to the object than

$$c = \frac{fve}{b}$$

Taking $b = \frac{1}{100}$ inch, we have,

$$c = 100\,fve \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Inserting this value of c in eq. 2,

$$d = \tfrac{1}{100}\left[1 + \frac{h}{100\,ves}\right] \ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

hich shows that, for any given blur, the distortion is independent the focal length of the lens. This simply implies that the shorter ie focal length, the nearer may one approach the object and yet btain an equally good image. To put it in another way; by always perating at the distance

$$c = \frac{fve}{b}$$

e always have the same blur, the same distortion, and also the me size of image, with all lenses.

It must not, however, be inferred from this that the small lens is xactly equivalent in this respect to the large one; because although ie images will be of the same dimensions in each case, the image ith the small lens is formed at a wider angle, and is consequently ot so perfect, or so well illuminated.

The chief advantage here of the small lens is that it implies a naller camera, and consequently a smaller shutter; which again nplies the possibility of using a wider slit, and so reducing the istortion.

The *minimum* permissible distance c has been taken at,

$$c = 100\,fve$$

hich in the above example gives $c = 560$ inches (the figure dopted); but for reasons too lengthy to enter into here, and which ie writer has explained elsewhere (see *The Technics of the Hand amera*), it is cutting things rather fine to work to this theoretical *inimum*, and it will be found a good practical rule to adopt the ormula.

$$c = 125\,fve.$$

n which it must be remembered the units are the *inch* and *second*: ut the following equivalent formula will probably be found more onvenient:—

$$c = 60\,fve \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (a)$$

where f is in *inches*; v in *miles per hour*; e in *seconds*; and c in *ards*.

In the case of being constrained to work at some given distance c, t is the exposure e that that we require to know; then

$$e = \frac{c}{60fv} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (b)$$

he units being as in formula a.

By keeping on the safe side of the limits indicated by these two ormulæ the distortion will rarely be noticeable.

It has been recently suggested in a somewhat authoritative manner hat the distortion caused by the focal-plane shutter might prevent a photograph from being of use as "legal evidence" in the case of a railway collision; but even in the extremely improbable event of a photographer finding himself on the right spot at the right moment, t is not at all clear what his picture could be made to prove, even supposing it were perfectly free from distortion. There is indeed a popular impression that a photograph might serve to determine the speed of a vehicle, or other moving object; but it is easy to show that this method would be something more than unreliable.

There is another matter perhaps worth mentioning, though it not of much practical importance.

If the blind is made to travel parallel to the motion of the object, the true exposure will obviously be either greater or less according as the blind travels in the same or an opposite direction to the motion of the image. For instance, if the image moves at the same rate as the blind, but in the opposite direction, the exposure will be half what it would be if the image remained stationary: and, in a general way, the exposure will be that due to the sum or difference of the two separate velocities of the blind and the image.

The velocity of the blind is—

$$v_b = \frac{s}{e}$$

and the velocity of the image is—

$$v_i = \frac{fv}{c}$$

The resultant velocity (*apparent* velocity of the image) therefore:—

$$v^{11} = v_b \pm v_i$$
$$= \frac{s}{e} \pm \frac{fv}{c}$$

and the exposure becomes,

$$e^1 = \frac{s}{v^{11}}$$

or

$$e^1 = e\left[\frac{1}{1 \pm \dfrac{fve}{cs}}\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

the *plus* sign being used when the blind travels against the motion of the image; and the *minus* sign when it travels with the image; and it must not be forgotten that (owing to the reversal of the image by the lens), when the blind travels with the image, it travels against the object itself, and *vice-versâ*.

Applying eq. 5 to the example given above, with the slit $\frac{1}{4}$-inch wide, we find that the exposure of $\frac{1}{500}$ second becomes:—

$$e^1 = \tfrac{1}{520} \text{ second,}$$

when the blind travels against the motion of the image (*i.e.*, in the same direction as the man); and

$$e^1 = \tfrac{1}{480} \text{ second}$$

when the blind travels with the image (*i.e.*, against the man).

With the $\frac{1}{2}$-inch slit the exposures are respectively $\frac{1}{510}$ second and $\frac{1}{490}$ second; so that from a practical point of view the difference is not worth considering. W. B. Coventry, M.Inst.C.E.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

X.—Schütt (continued), Neuhauss (1898).

The only way out is the supposition that the silver in the argentiferous gelatine laminæ merely contributes to the raising of the refractive power, and thus also of the reflective power of the gelatine. Lippmann[1] had made use of this hypothesis to explain the colours on moistened bichromated gelatine plates; thus, in Lippmann's view, the periodic change of refractive-power alone can be the cause of reflection.

Meslin[2] thought it improbable that the silver molecules can influence the refractibility of the gelatine on the ground of the small refractive power of silver.[3] It is, according to Schütt, very probable that in our case we have not to deal with pure silver, but with a sub-bromide, and the indices of silver-combinations are relatively high; but, even if the index of the silver deposit is very small, it is in any case different from that of the gelatine, and the hypothesis of a periodic change of refrangibility is thus justified.

Taking the wave-length of light in gelatine as the same as that in

[1] *Comp. rend.*, cxv., 1892, 575.
[2] *Ann. chim. phys.* (6), xxvii., 1892, 371.
[3] See Landolt-Börnstein, *Phys. chem. Tab.*, 1894.

air, the number of maxima and minima cannot be, after Schütt's preceding measurements, more than three (in the red) to five (in the extreme violet).[4]

A necessary consequence of this inner structure of photochromes is that not the argentiferous laminæ alone generate the light-reflection, and the gelatine laminæ only serve as transparent dividing layers, but both classes of laminæ take part in the reflection, as if laminæ, each a quarter of a wave-length thick, of two refrangibilities, were laid on one another. Just as these laminæ must all have that thickness to be able to reflect a definite colour, we have in photochromes to think of the planes of mean refrangibility as distant by a quarter of a wave-length.

An experiment of Neuhauss's[5] forms a good verification for this equal-valuedness (gleichwerthigkeit) of the laminæ. If one rubs away mechanically from the top layer, which takes most part in the reflection, it becomes thinner, and the colour originally visible gives place to the next one with shorter wave-length; later, after more complete removal of the layer, the first colour appears again. Neither on the supposition of (simple) thin films nor on that of periodic silver mirrors can this behaviour be explained, for in both cases the colours only depend on the distances of the reflecting particles from one another, and this can certainly not be varied periodically by a gradual wearing away of the film.

Lippmann himself remarked that in his theory (1894) neither absorption nor the phase-loss on reflection was considered. A still further omission is that an indefinite, very great number of laminæ is taken. Schütt[6] thus held it to be requisite to seek also an experimental test of the correctness of that conclusion by means of spectroscopic analysis of the colours of good spectrum photochromes. He found thus, that, in opposition to theory, all the spectral colours from Lippmann photochromes are *mixed colours*, in every one indeed a limited number of spectral-colours are lacking; but on the other hand others of very different wave-lengths are very completely reflected.

Meslin[7] also investigated spectroscopically the light from such a photochrome, but only obtained an indistinct spectrum because he used a slit;[8] perhaps, also, a less brilliant photochrome. The results are in harmony with Schütt's own experiments on less "powerful" photochromes (weniger kräftigen Probeplatten).

The further development of the theory requires the index of the argentiferous laminæ to be known with some exactness. Also the laws of reflection at such laminæ—the phase-change—can hardly be established with sufficient certainty. But it is of interest to consider a similar, simpler case—that of a number of thin, transparent laminæ of alternately lesser and greater index, placed on one another, of thickness a quarter of the wave-length at each spot.[9] Schütt found a remarkable coincidence of the colours calculated with those which a good photochrome of the solar spectrum shows.

In conclusion,[10] Schutt enumerated the conditions necessary for the correct reproduction of colours in Lippmann's method: the limited thickness of the film, the grainlessness of the emulsion, and the correct length of exposure; and pointed out that the colours only coincide with those of the original for our eyes, not in a physical (more exact) sense. Much remains to be done, said Schütt, before Lippmann photochromes are raised above the level of an interesting and instructive physical experiment.

This paper of Schütt's was discussed by Wiener,[11] but before Wiener's work was published, Neuhauss published his own searches on the photomicrography of Lippmann films and the resu ing direct proof of the existence of the laminæ foretold by Zenke We shall, then, give an account of this paper next.

Wiener (1899) had established the existence of stationary wav but did not prove Zenker's assertion that the colours are produced stationary waves.[13] To have done this, he would have had to bri the laminæ produced by them to intuition (Anschauung).[14] Th could only happen by examining sections of photochromes. It questionable whether Wiener could have done this then, as the vestigations were limited to images on paper; but two years la Lippmann provided a far more suitable material for such research —transparent films on glass.

Already in 1894 Neuhauss[15] had stated the error of the view th with our optical means, a direct proof cannot be carried through, f the distances of these hypothetical laminæ lie below the limit perceptibility. The half wave-length of spectral red is 0·00038 mm the distance of two successive cross stripes in *Amphipleura pellucid* is only 0·00022 to 0·00025 mm.

Very comprehensive researches on Lippmann's method in th summer of 1897[16] caused Neuhauss to try to bring to proof th existence of Zenker's laminæ. A glass plate was coated wi collodion and, after drying, with silver albumen, exposed in th spectrograph, and developed with pyrogallol and ammonium carbo ate. The fixed and dried plate showed a bright spectrum, and th film was then separated from the glass. A hundred sections (in th red) were then cut by an expert anatomist (E. Flatau), who used f imbedding both paraffin and celloidin—paraffin made far finer sectio possible.

With *Amphipleura* the refractive index of the imbedding mediu plays a very important part; the greater the index, the easier th resolution; and it is best to let the preparations lie in realgar (inde 2·4). But here the case is quite different from that with diatom The fine silver laminæ are already imbedded in albumen; the index c the substance in which the albumen pellicle with the laminæ swim cannot then influence the resolving capacity.

Thus a medium of index which comes as near to that of the object carrier and cover-glass as possible was chosen—Canada balsam Glycerine imbedding was also sometimes tried, since it was suppose that the glycerine, by swelling the albumen, would shift the lamin further apart.

PHILIP E. B. JOURDAIN.

63 *Chesterton Road, Cambridge.*

ORGANIC DEVELOPERS AND THEIR USE

(With Particulars of a New Mixture).

[A Paper read before the Croydon Camera Club, April 10, 1901.]

THE title of this paper covers all modern developers, save the ir salts; but I shall only deal with derivatives of the aromatic serie omitting such bodies as hydroxylamine, hydramine, &c.

The constitution of the aforesaid developers is as follows:—Al are derived from the one body—benzene, which consists of six carbo atoms, having four affinities each, which are arranged in a ring; tw of the affinities are satisfied by the contiguous carbon atoms; a thir by one hydrogen atom, the fourth attaching itself to either o

[4] The measured thickness of the film is that adapted for the best representation of colours. Also, by Becquerel's methods, the thickness of the film amounted to about 0·0016 mm. (Wiener, *Wied. Ann.*, lv., 1895, 225).

[5] *Phot. Rundschau*, viii., 1894, 301.

[6] *Op. cit.*, § 5, 544–547.

[7] *Loc. cit.*, 886.

[8] Schütt found (*op. cit.*, 545) a better arrangement than a slit to be the following: The photochrome was covered with two matt black strips of paper so as only to leave a coloured band of from 1 to 2 mm. broad, and then placed on a black background so as to reflect daylight nearly perpendicularly. The bright line was then examined by a hand spectroscope without slit or collective lens at a distance of 1½ to 2 m.

[9] Schütt, *op. cit.*, § 6, 547–552.

[10] *Op. cit.*, § 7, 552–554.

[11] "Ursache und Beseitigung eines Fehlers bei der Lippmann'schen Farbenphotographie, zugleich ein Beitrag zu ihrer Theorie" (Leipzig, August, 1899), *Wied. Ann.*, lxix., 1899, 455–530.

[12] "Nachweis der dünnen Zenker'schen Blättchen in den nach Lippmann's Verfahren aufgenommenen Farbenbildern" ("Eingegangen, 19 Februar, 1898") *Wied. Ann.*, lxv., 1898, 164–172.

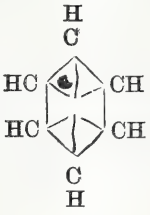
[13] Neuhauss *here* only refers to Wiener's memoir of 1889. Wiener's work of 1895 (see THE BRITISH JOURNAL OF PHOTOGRAPHY, March 22, 1901, p. 180), contains, one may say, an indirect *proof* that the colours are produced by stationary waves, when it is considered in connexion with the other characteristics of Lippmann photochromes (by which, *e.g.*, the simple thin plate hypothesis is eliminated). Neuhauss's merit is to have given a *direct* proof which stands by itself—is not dependent on any other facts for its evidence.

[14] This word is to be considered stripped of any philosophical meaning. In mathematics and natural science, "Anschauung" has, within the last ten or twenty years, come to be much used as meaning exclusively *spatial* perceptions. Thus "geometrische anschauung." This is precisely its meaning here.

[15] *Phot. Rundschau*, 1894, Heft 12, p. 360, and Eder's *Jahrb. f. Phot.*, 1895, p. 188.

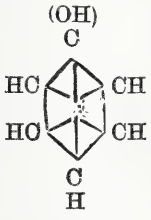
[16] *Phot. Rundschau*, 1897, Heft 11, 12; 1898, Heft 1–5.

ıe contiguous carbon atoms, or being directed towards the centre, ıus :—



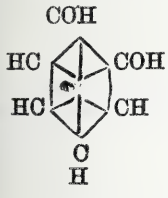
Iow, compounds may be formed from this body by the substitution ›r a hydrogen atom of either one of the groups (OH), (NH_2), (CH_3), SO_3H), (COOH), which have one free affinity each, and are termed ydroxyl, amido, methyl, sulphonic, and carboxyl groups.

If in benzene we replace one hydrogen atom by an (OH) group, we get body which we can represent by the formula

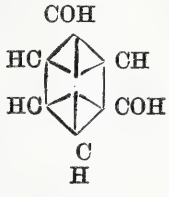


ınd which is termed phenol, though it is more generally known as arbolic acid.

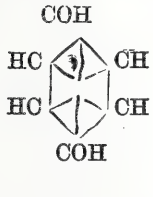
It is possible to replace a second hydrogen atom in benzene by ıydroxyl, and this second group can enter in one of three places, as is hown below : these three positions being next to, one place from, or pposite to, the other OH group, and being termed respectively ortho, neta, and para,



ORTHO.



META.

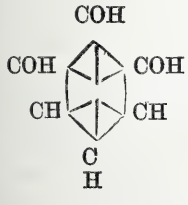


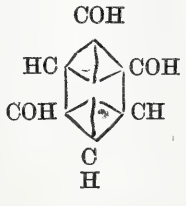
PARA.

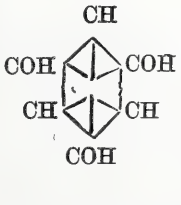
All of the three bodies thus formed may be used in photographic levelopment, the ortho body being pyrocatechin, the meta, resorcin, ınd the para, hydroquinone.

Before we consider means of producing other developers it would be vell if I were to explain that these groups, which it is so easy to add ınd remove on paper, can be actually inserted and withdrawn in the aboratory, though sometimes by long processes, and with considerable lifficulty.

Having dealt with the developers formed by inserting two (OH) groups n the benzene nucleus, we will next examine the results by adding a hird. There are three positions also, which we can obtain by this reatment, that in which all three groups are close together, or adjacent, that in which two are contiguous, and the third separated by ne place, and that in which the groups are symmetrically placed.

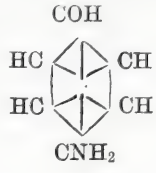




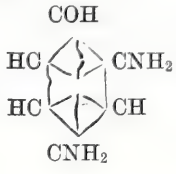


These are known as adjacent, asymmetrical, and symmetrical trihydroxy, benzene, or more commonly as pyrogallic acid, oxyhydroquinone, and phloroglucinol. All these may be used in development, but only pyro is generally used. We might with perfect ease carry the process further, and get a still stronger developer by inserting four hydroxy groups, but the resultant products would be very hard to keep. However, a friend is trying the experiment for me, and if it is productive of any good, I shall be pleased to place the results before you.

Now,if we again return to our phenol, it will be seen that, as before,we may insert an amido, or (NH_2) group in any of the three positions, but so far as I am aware only the para-body, para-amidophenol, is actually used as a developer in photography.

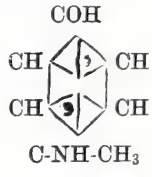


Then if we take para-amidophenol and insert a second amido group in the asymmetric position next to the (OH) group, we get a diamidophenol of the formula :—



This is very much used under the fancy title of amidol. In this particular case we can go one step further and introduce a third amido group, getting a tri-amidophenol. The hydrochloride of this may be used for developing, but the free base has never been separated, so far as I am aware.

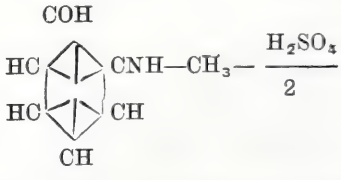
There are three more developers of this group, which are all formed from para-amidophenol. These are metol, ortol, and glycin. If para-amidophenol be taken, and one hydrogen atom of the (NH_2) group be replaced by the methyl group, a methyl para-amidophenol of the formula



is obtained; it is the sulphate of this which is sold under the trade name of metol.

I have frequently noticed in the Answers columns of photographic papers, a statement to the effect that ortol is a mixture of metol and hydroquinone. To anybody who has used both substances in development that statement will seem extremely improbable, having regard to the very different development factors, &c.

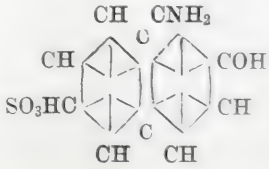
I personally am inclined to think that the formula given in the Annual of The British Journal of Photography is perfectly correct, and that ortol is a mixture of hydroquinone, and the sulphate of methyl ortho-amidophenol, which has the formula :—



Glycin differs from all other developers of this class in that it is acid in character, for it is formed by inserting the carboxyl group in place of a hydrogen atom in the methyl group of metol, being an aceto-para-amidophenol of the type given above.

There are only two other developers derived from benzene in common use, diphenal and paraphenylene diamine; but I do not intend to deal with them here as they are not very important; there is, however, one other developer derived from, if I may so express it, a relative of benzene, which is worth attention. This is eikonogen.

We may join two benzene rings together, as is shown below,and obtain a body called naphthalene, which is a well-known gas-tar product. In this, if we introduce (OH), (NH_2), and (SO_3H) groups, we get a body of the following formula, which we may term α amido, β_1 naphthol β_3 sulphonic acid, which is called in trade eikonogen.



The dealers recently have given us many examples of new developers. In trying to obtain others, I originally worked with flask and bunsen, but I have since found it much easier to work them out on paper. If we start, for instance, with phloroglucinol, we can introduce in succession, amido, sulphonic, methylamido, and aceto, groups, multiplying developers ad infinitum. Similarly, we might take any amido, or hydroxy, naphthol, and make totally new developers by the score. I do not mention this in the hope that the number of developers may be multiplied, but that you may see how extremely simple the finding of a new organic developer really is: the working out of the best formula is, of course, a totally different matter.

There is one direction in which, however, there is scope for much good work. Naphthalene at present is so extremely cheap that it ought to be possible to produce from it a developer at a very much less cost than anything at present on the market.

We will now consider the various developing agents, in respect to the substances used with them to make the actual developing solution. A developer contains:—

(1) Organic reducer.
(2) Preservative.
(3) Alkaline accelerator.
(4) Restrainer.

Preservative.—In my opinion, this should be either sulphite or metabisulphite. From theoretical reasons, it seems to me that the latter should be the best. If metabisulphite be dissolved in water it dissociates to a large extent into alkaline sulphite and sulphurous acid, and I am inclined to think that as the free sulphurous acid has a greater affinity for oxygen than its salts, it would form a better preservative.

I do not consider that nitric acid is of much value as a preservative, as it may be expected to combine with the organic reducer to form a nitro derivative, and, as this nitro derivative is generally a coloured body, it would assist in producing stain.

Although Messrs. Hurter and Driffield have stated that no method of development, *i.e.*, no alteration of the quantities of accelerator and bromide in the developer, will in any way affect the relative densities of a negative, they make one qualification, the overlooking of which has led many astray; the qualification is that caustic alkalis attack both silver and gelatine, and therefore modify the gradation, though only at the expense of the half-tones. This is a strong argument against the use of any strongly alkaline developer; another one being given by the fact that strong alkalis attack the skin. The only utility of putting bromide in a developer appears to be to ward off risk of chemical fog. Hence in a good developing solution we want the following things:—

(1) A non-staining reducer.
(2) A good preservative.
(3) Carbonated or weak alkali.
(4) A capacity for taking bromide without producing chemical action.
(5) A capacity for producing a comparatively non-actinic image.

I will now consider the two great rival developers to-day. (1) Pyrogallic acid. There are two standard pyro developers. The first is pyro-soda. This does not stain (usually). It keeps well; uses carbonated alkalis; takes bromide well; gives a non-actinic image. Hence it is a first-rate developer, and I know of only one objection to it: the state of the fingers after using it.

The second is pyro-ammonia. This stains, uses strong alkali; smells; tends to produce red fog.

Another favourite developer is hydroquinone.

This may be used either unrestrained with carbonate, or strongly restrained with caustic alkalis.

I do not consider either solution very good, though I have found the strongly alkaline solution useful in scientific photography where no half-tones are wanted, as, for instance, in spark photography.

In conclusion, I have much pleasure in putting before you a new but very simple developer which I have used for a year, and have found very efficient. It is a single solution; it keeps for three weeks in half-empty bottles; it does not stain; it gives a non-actinic image; it contains bromide and carbonated alkali only; its development time varies from quarter-hour in summer to half-hour in winter; its development factor (Watkins) is about 3. The formula is as follows:—

Resorcin	6 grammes.
Hydroquinone	3 grammes.
Sod. sulphite	12 grammes.
Pot. carbonate	12 grammes.
Pot. bromide	½ gramme.
Water	1 litre.

I am indebted to THE BRITISH JOURNAL OF PHOTOGRAPHY ALMANAC for 1900 for information concerning one or two developing agents.

C. E. KENNETH MEES.

POTASSIUM CHLOROPLATINITE IN SOLUTION.

POTASSIUM chloroplatinite keeps well in solution when pure water is used, but when ordinary tap water is employed the salt has a tendency to decompose, and the solution then becomes useless owing to the precipitation of the platinum in some insoluble form. To overcome this difficulty, all that is necessary is to acidify the solution slightly. For a fifteen-grain tube of chloroplatinite dissolved in fifteen drachms of water the addition of one or two drops of hydrochloric acid will be quite sufficient. In cases where precipitation has taken place the addition of a drop or two of hydrochloric acid will generally result in re-solution in a few days. I have not tried whether any other acid acts equally well, but the acid mentioned does not appear to act detrimentally when the solution is used to make the usual acid toning bath. On two or three occasions recently there have been queries about the cause of the precipitation referred to. Hence this note.

ALEXANDER MACKIE.

PHOTOGRAPHIC SOCIETIES AND KODAK, LIMITED.

IN addition to the Manchester and West Surrey Photographic Societies' resolutions disapproving of the action of Kodak, Limited, in regard to the sale of rollable film, we have also received the following:—

"At the meeting of the Southport Photographic Society, held April 17, the following resolution was unanimously adopted:—'Having heard the restrictions Messrs. Kodak, Ltd., propose inflicting on their trade customers concerning the sale of rollable films, this Society enters a strong protest against their action as being most unfair and repugnant to their ideas of fair trading, and, unless such conditions are withdrawn, will refrain from using films (or goods) of Kodak manufacture.'"

"At the meeting of the South Norwood Photographic Society on Thursday, April 18, the following resolution was passed:—'That this meeting desires to epress its strongest disapproval of the action of Kodak, Ltd., in interfering with the freedom of the dealer; this is not only against the feelings of Englishmen, but is calculated to stop all progress in photography, therefore should be opposed to the utmost by all interested in the art. All members are advised to refrain from purchasing or using the material of the company until they see fit to remove the obnoxious restrictions.'"

"In view of the fact that Kodak, Ltd., have notified photographic dealers not to sell certain photographic materials if they wish to be supplied with the company's goods, the Croydon Camera Club adopted the following resolution nem. con., at its meeting on April 17:—'That the Croydon Camera Club, whilst fully recognising the services rendered by Kodak, Ltd., to photographers, deplores the threatened importation into this country of methods of trading opposed to British ideas of fair play, and can only regard the company's action as an attempt to establish an injurious monopoly.'"

"Thornton Heath Polytechnic Photographic Society met on Tuesday, the 16th inst., to hear a paper on 'Panoram Photography,' but the following resolution was passed unanimously:—'That as a protest against the action of Kodak, Ltd., in their present endeavour to restrict the sale of amateurs' photographic materials such as roll-films, roll-holders, &c., the reading of the paper on 'Panoram Photography' be deferred, and that a copy of this resolution be communicated to Kodak, Ltd."

HAGEY'S EXPOSURE SCALE.

[Patent No. 16,075 of 1900.]

THE scale shown consists essentially of three parts, namely, a rear card 1, a strip 2, adjustable to any desired position upon or across the face of the said rear card, and a transparent cover strip or sheet 3, overlying the rear card and the adjustable face strip.

he rear card has a chart comprising opposite columns of dates esenting a year and a series of curves, 4, representing the mean t value at different hours of the day, these curves bearing a erent relation to the graduations of the date columns.

he rear card also has a group of subject factors 5, and a scale 6, esenting the degrees of sensitiveness of plates or films which are ly to be used.

he adjustable strip 2 has along one edge a series of indices repreting different relations of aperture to focus and different combinations of lenses, and on the other edge a graduated exposure scale, d the transparent cover strip, or sheet 3, has a series of parallel es indicating different conditions of light, these lines being parallel ith the graduations of the scale 6, and with those of the exposure ale of the adjustable strip 2.

That one of the lines upon the transparent cover strip or sheet, which dicates a normal condition of light, preferably serves as a pointer connexion with the graduated scale indicating the sensitiveness of the late.

In using the device the strip 2 is adjusted in respect to the chart on the card 1 until its upper edge is in line with that graduation of the date columns indicating the time of year at which the exposure is made; thus, as shown by the drawing, it is adjusted for an exposure made about the 5th of March or the 7th of October. The strip 2 is then laterally adjusted until the graduation indicating the relation of aperture to focus and the combination of lens employed coincides with the curve indicating the time of day at which the exposure is made, the strip, as shown, being set for the use of a single f-11.3 lens, at 7 a.m. or 5 p.m., a triple f-16 lens, at 8 a.m. or 4 p.m., or a double f-22.6 lens, at 10 a.m. or 2 p.m.

When the strip 2 is thus set the proper time of exposure is indicated by that graduation of the exposure scale which coincides with the line on the transparent cover strip or sheet indicating the condition of light at the time of exposure; thus the exposure in intense sunlight would be about 1/8 of a second, in bright sunlight 2/10 of a second, in diffused sunlight a little less than 3/10 of a second, in dull light 4/10 of a second, and in very dull light about 11/20 of a second.

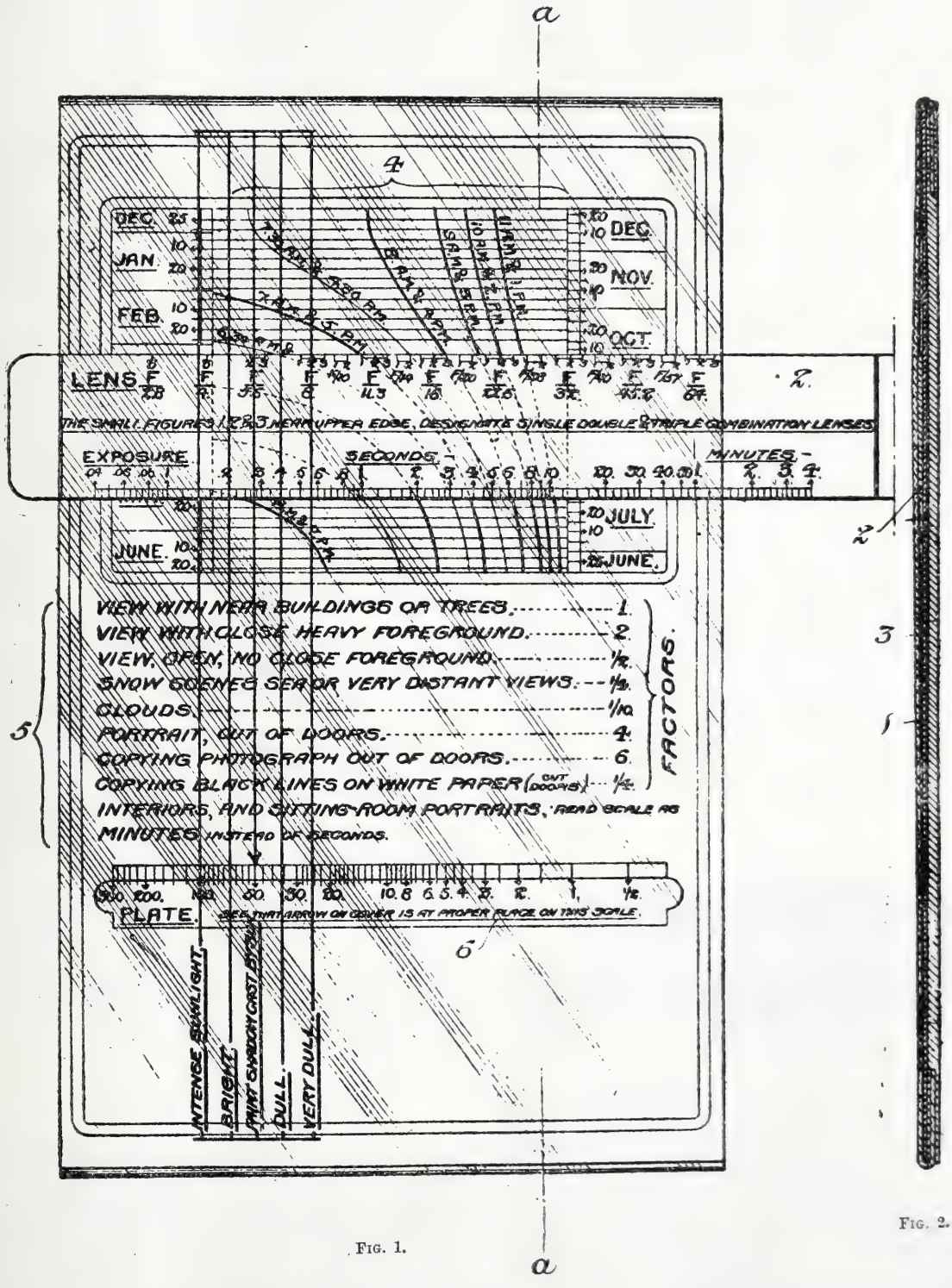


Fig. 1.

Fig. 2.

This is upon the supposition that the sensitiveness of the plate is represented by the graduation 50 of the scale 6 with which the pointer registers.

Lateral adjustment of the cover sheet 3 or back card 1 in respect one to the other to indicate a plate of less degree of sensitiveness, will, of course, bring the lines on said cover sheet 3 into such relation to the exposure scale on the strip 2 as to indicate a longer time of exposure, and, conversely, lateral adjustment of said cover sheet or back card to indicate a plate of a greater degree of sensitiveness will indicate a correspondingly less time of exposure.

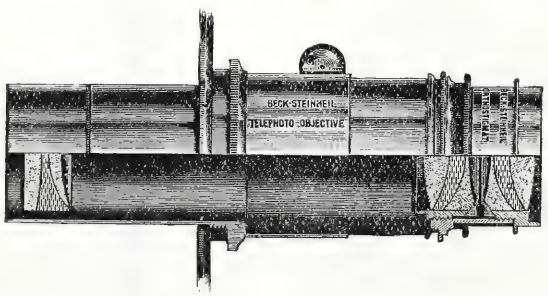
It will be apparent that the use of the group of subject factors on the card 1 is a matter of convenience rather than necessity, as these factors are not affected by the adjustments provided for, the time of day and year, the character of lens, the sensitiveness of the plate, and the condition of the light being the variable factors, while the subject factors bear a certain definite relation one to another and are independent of such variable factors.

The scale representing the sensitiveness of plates may also be omitted in some cases, as, for instance, where a plate of known sensitiveness is always used, in which case the lines indicating the character of light will always bear the same lateral relation to the chart containing the curves representing the mean value of the light at the time at which the exposure is made, and in such case these lines may, if desired, be formed directly upon the card containing the said curves.

The curves on the chart shown in the drawing are calculated for the latitude of Washington, D.C., United States of America.

THE BECK-STEINHEIL TELE-PHOTOGRAPHIC LENS.

Messrs. R. and J. Beck, Ltd., of 68, Cornhill, have introduced a new tele-photo attachment, manufactured at their works in Kentish Town, under licence from Messrs. Steinheil. It is primarily adapted for the orthostigmats I. and II., but it may be used with any high-class anastigmat. The attachment is composed of three lenses cemented together—the first a meniscus, the second a double concave, and the third another meniscus of a lower magnifying power than the first. The surfaces do not vary as much as 1-20,000 in. The attachment has only two reflecting surfaces, and thus, when combined with a positive, the increase of loss of light from this source is not of vital importance. Adverting to the special uses of a negative attachment, Messrs. Beck point out that it often occurs, particularly in landscape and architectural photography, that the object to be photographed is situated at such a distance that it cannot be obtained by a lens of the usual focal length without rendering the picture too small; on the other hand, if an ordinary lens of very long focus is used, the extension of the camera so necessitated is often unobtainable, or, if obtainable, makes the instrument cumbersome. These difficulties are overcome by the addition of a lens of negative focus to the ordinary objective. The addition of this in no way interferes with the use of the ordinary lens for other photographic purposes. This negative lens produces the



following effects:—It considerably increases the length of the complete tele-photo system, as compared with the focal length of the positive element. It displaces the optical centre to a point in front of the photographic lens. It renders a large number of different foci available. It reduces the rapidity of the lens. The field of this particular tele-photo attachment embraces an angle of about 10° or 15°.

This lens has been specially corrected for astigmatism and spherical aberration, and to give as flat a field as possible. The importance of this is obvious when it is remembered that the tele-photo lens magnifies all errors present in the positive, according to the magnification in use, besides adding its own errors. From this it can be gathered that it is as equally important to have a first-rate negative element as it is to have a first-rate positive element, and a badly corrected or badly adjusted tele-photo element combined with the very best procurable positive lens will not give satisfactory results. The Beck-Steinheil tele-photo attachments are all engraved with the magnification procurable at the various separations, whether it be one of the orthostigmats or any other lens that is fitted to it. The mount is the usual brass rack-and-pinion one.

Our Editorial Table.

We have received No. 4 of the Patent Office Library Series, "Guid to the Search Department of the Patent Office Library," with a dic tionary of "trade or fancy" words. The handbook is intended t serve as a guide to searchers in the department of the Library of th Patent Office reserved for such literature. It indicates in what publica tions, and for what periods, grants of patents and registrations o trade marks and designs are recorded. The information collected ha been arranged under the names of countries. Those who have occasio to seek information at the Patent Office will thank Mr. Dalton, th Controller, for this and the preceding volumes, which are most usefu guides.

The "Agfa" Book on Photographic Developers.

Published by Messrs. A & M. Zimmermann, 9 and 10, St. Mary-at-Hill, E.C.

This little book, which is in its third edition, gives about 40 page of facts and formulæ relating to the use of rodinal, imogen sulphite eikonogen, diogen, amidol, glycin, metol, and other developing sub stances prepared by the well-known "Agfa" house of Berlin. Messrs Zimmermann inform us that they are issuing the book gratis, anc have some 60,000 copies ready to send out. Every user of the "Agfa' developers should read the following notice in the preface:—"In defer ence to an often expressed wish we have inserted all formulæ in th English and metrical weights system. The one is not necessarily a exact translation of the other, as in many cases we have endeavoured to simplify the English, but the solutions will be found to be of identica proportions. The English weights, &c., are all calculated by apothe caries' weight, *i.e.*, 60 grains to the drachm=480 grains to the ounce The goods are sold in original packages determined by the avoirdupois weight." We are pleased to possess this guide.

La Photographie d'Art a l'Exposition Universelle de 1900.

Edited by C. Klary.

Published by Gauthier-Villars, 55, Quai des Grands Augustins, Paris.

We owe our Paris confrère, the Editor of "Le Photogramme," a debt of gratitude for this admirable production. To our knowledge, it is the only attempt to illustrate and describe pictorial photography as it manifested itself at last year's Universal Exhibition. M. Klary has chosen examples contributed by photographers in the various countries which participated in that exhibition, and the accompanying letter-press is selected from many photographic publications, including this Journal. M. Klary has shown great judgment in the selection of the photographs, and if he has not included examples by a few of the leading men on the Continent and elsewhere, has nevertheless succeeded in representing to us most of the best aspects of Pictorial Photography at the end of 1900. When in Paris we made a point of inspecting the whole of the exhibited photographic work, a vast mass of goodness, badness, and indifference, and therefore we can appre ciate the skill with which M. Klary has extracted the most typical an representative productions from the material before him. In year to come we shall value this volume as a useful record of the par played by pictorial photography at Paris. We congratulate ou confrère on his enterprise.

Lantern-slide Making.

By Rev. F. C. Lambert, M.A. 144 pp. Price 1s.

London: Hazell, Watson, and Viney, 1 Creed-lane, E.C.

The gentle art of lantern-slide making is not so much practised at this period of the year as in the autumn and winter months, and therefore Mr. Lambert's book cannot be considered as making a quite seasonable appearance. But it is a book that will keep, for it has been produced according to the author's well-digested method of compiling photographic manuals, namely, by paying very close and painstaking attention to small details of practical working, which most writers ignore. Mr. Lambert's plan is to treat every little point of procedure with the utmost thoroughness, so as to save his readers the trouble of "working out" things for themselves. It is upon such lines that "Lantern-slide Making" has been compiled. The beginner will find it a capital introduction to the "gentle art;" the old hand may turn over its pages and refresh his memory with many a wrinkle that he had not hitherto tried, or may have forgotten; and so the book is worthy of a place on the bookshelves of both classes of workers.

The Wave Theory of Light.

Edited by Henry Crew, Ph.D. 162 pp. Price 1 dollar.
New York: The American Book Company.

Professor Crew's book should be appreciated by all students of fundamental physics and their relation to light action in photography. It consists of a collection of treatises by great workers of the past who have laid the foundations of much of our present knowledge. Huygens' "Treatise on Light," which was presented by the author to the Paris Academy of Sciences in 1678, is given first place; this treatise, it may be pointed out, deals with the rectilinear propagation of rays, the laws of reflection, and the laws of refraction. There are three papers by Thomas Young, whose name is associated with the theory of colour vision, including one on the theory of Light and Colours, and another on Experiments and Calculations relative to physical optics. Fresnel's celebrated memoir on the diffraction of light and Arago and Fresnel's memoir on the action of rays of polarised light upon each other conclude the volume, which also has a very valuable bibliography. In this, besides historical books, others are detailed which relate to diffraction and interference; aberration; stationary light waves, and the wave theory. Professor Crew himself contributes a useful explanatory preface to the volume, which includes within a narrow compass some of the most valuable theoretical work on light and colour that has ever been accomplished.

A First Book of the Lens.

By C. Welborne Piper. 170 pp.
London: Hazell, Watson, and Viney, 1, Creed-lane, E.C.

There have been books relating to the photographic lens to which Carlyle's contemptuous criticism, "a puir skeleton of a book," fully applied, but the volume just published by Mr. Welborne Piper is in no danger of earning such a character. It is a very well clothed book indeed. The one thing to which we take exception is the title. "A First Book," which is also "an elementary treatise," leads one to suppose that a primer of the usual kind, leading off with the time-honoured diagrams and explanations of Monckhoven, Traill Taylor, and others, relating to spectral decomposition, refraction, &c., is offered to the reader; but it is not so. Mr. Welborne Piper's book is mainly expository, and suited to the needs of the advanced student. In a series of ten chapters he deals with light and optics, the action of lenses, focal points and distances, combining lenses, aberration, scale, intensity and illumination, depth, focussing scales, measuring lenses and types of lenses. The chapter on aberration is especially valuable, and from this we may cite, as an illustration of Mr. Piper's method of happily handling a recondite subject, the section on astigmatism, and the outline of the necessary condition for its elimination from the photographic lens. Indeed, clearness and lucidity are characteristic of the book throughout. "Modern anastigmats are distinguished mainly by the fact that spherical aberration is compensated at the same time that astigmatism is corrected," is another illustration of Mr. Welborne's simplicity of explanatory style. Of distinct practical use are the chapters on focussing scales and measuring lenses. The book, which as we have hinted deserves a better title, is not one to put into the hands of a novice, and we fear there are many advanced photographers who cannot be persuaded to take enough interest in that beautiful product of optical science, the photographic lens, to read the volume; but still there are many to whom the subject is of real importance who will be glad to add "A First Book" to their sources of consultation.

News and Notes.

Leicester Literary and Philosophical Society (Photography Section).—At the last monthly meeting the Vice-Chairman and Hon. Secretary were appointed to represent the section on the committee for the Local Photographic Survey.

The Patent Office Library.—The convenience and usefulness of the Patent Office Library, and the accommodation available for students and investigators is less known than they might be. It is possible to do a great deal of work in investigating photographic, general, and scientific subjects (not by any means necessarily patent subjects) from the splendid store of works on the shelves, and to get through a great deal of writing with a minimum of trouble and interruption. But great changes are now in progress. The Patents Office will be ready for occupation in August next, but the library will not be in its new quarters, on the ground floor, till early next year.

The Becquerel Rays.—"Kirchhoff's Technische Blätter" states that recent experiments by the Berlin High School of Technology have proved that a new element is responsible for the Becquerel rays, and the interesting fact has been observed that these rays render almost every transparent substance luminous in the darkness. These rays make it possible to tell genuine diamonds from artificial ones in the dark. This will prove of great practical importance in testing. The experiments have also resulted in obtaining, for the first time, larger quantities of the new element, which has demonstrated that rays emanating from a larger quantity make the air such a conductor of electricity that it is hoped this property can be utilised in wireless telegraphy. Experiments for this purpose are being made in the Berlin institution, but the deepest secrecy is maintained concerning them. It is stated that the results will soon be laid before the Emperor, which seems to indicate that the discovery is regarded as one of great importance.

Commercial & Legal Intelligence.

Messrs. R. Flamank and Son have removed their photographic works to Stafford House, The Retreat, Sutton-street, Aston, Birmingham.

"Anti-hypo."—This is the name of a hypo-destroyer that is being introduced by Messrs. George Meyer and Co., Zurich. It is issued in pillular form.

Messrs. Green Bros., Crown Works, Rotherham, are issuing moirée envelopes for c.-d.-v. and cabinet photographs in pink, white, and light green tints. A sample submitted to us shows that the envelopes are tasteful and pretty.

The Alvan Clark and Sons Corporation, Telescope Makers.—We are informed that the business of Alvan Clark and Sons, manufacturers of astronomical telescopes, has been incorporated under the above title. The Corporation retains the expert services of Mr. Carl A. R. Lundin, who for the past twenty-seven years has been identified with the management of the business.

Will Platinum Become Cheaper?—For years past, owing to the many purposes to which it is being applied, the price of platinum has been increasing, and is still advancing, notwithstanding that new sources of supply are reported to have been discovered in different parts. The main source of supply has up to the present been the Ural Mountains in Russia. The "Standard's" Odessa correspondent, writing one day last week, says that for a protracted period this rich Siberian Frontier held the unique position of being the sole producer of certain rare and precious metals whose exploitation was carried on by the most primitive means and methods, and was confined entirely to native hands. He says that from the banks of the mountain stream Losva come well-authenticated announcements of the discovery of immensely rich gold and platinum deposits, and that a wealthy Muscovite merchant has secured the exclusive rights for the mining fields in that district, and is now seeking to inaugurate their exploitation by means of foreign capital and foreign energy, preferably English. If all this be correct it should, in a short time, tend to bring down the price of platinum which, for years past, has been continually advanced until it has reached "famine prices," as all who employ it for photography are fully aware. We shall wait and see if it does.

Broken Negatives.—In the Grantham County Court recently Mr. H. J. Bliss, photographer, Grantham, sued Crayon, Limited, photographic artists, of 49B, Brecknock-road, London, N., to recover the sum of £3 14s., the cost of replacing four negatives.—Plaintiff's particulars were that in November, 1900, he entrusted to the defendants four photographic negatives (each 12 inches by 10 inches) for the purpose of enlargements being made from them. On their being delivered at Grantham by the defendants' agents, the Great Northern Railway Company, the negatives were found to be smashed.—Mr. J. B. Barlow appeared for the plaintiff, and Mr. F. A. Venning, the managing director of Crayon, Limited, appeared for the defendants.—Mr. Barlow, who produced the broken negatives and the packing case, said the packing was most carelessly done. The wooden case could not be damaged, but the negatives themselves were not packed tight, and could move about, so that a slight shock would break them. Evidence was called to prove that the negatives were broken when they were delivered to plaintiff, and also that the parcel was transmitted at the ordinary rate, and there was nothing on it to show that the package contained glass.—The defence was a reliance on a clause in defendants' price list, in which they said they took the utmost care of negatives entrusted to them, but they could not be responsible for loss, damage, or breakage. If plaintiff had a right of action it was against the railway company. They maintained that the negatives were packed properly.—His Honour pointed out that plaintiff's case was that defendants did not take reasonable care in the packing.—Plaintiff said defendants packed them in a way that it was almost certain for them to get broken.—Judgment for plaintiff for the amount claimed was given.

In the Court of Appeal on Friday last, before Lords Justices Collins and Stirling, the case of the Thornton-Pickard Manufacturing Company v. Thornton came on for hearing, and was an appeal by the plaintiffs from an order made by Mr. Justice Kekewich. Mr. Fletcher Moulton in opening the case, said the defendant, Mr. J. E. Thornton, was one of the original vendors of the company, which was formed to carry on the business of Messrs. Thornton and Pickard, at Altrincham. The defendant entered into a covenant to become managing director of the

company, and not at any time to carry on, or be concerned in any other similar business within the limits of the United Kingdom. Subsequently the defendant became desirous of severing his connexion with the company, and he was released from any of the obligations he had entered into with the company, except so far as they concerned the covenant not to trade in a similar business in the United Kingdom. Last year, however, the defendant formed a company known as the Thornton Film Company, for the purpose of taking over certain patents for the manufacture of glasoline films, and was actually proposing to establish a factory at Altrincham, where the plaintiffs' factories was also situated. This was regarded as a clear breach of the covenant into which he had entered, and an injunction was therefore applied for. At the trial of the action in the Court below, the learned judge arrived at the conclusion that the films came within the definition of "other photographic appliances," and that there had been a breach of the covenant, but he gave judgment for the defendant on the ground that the covenant was unreasonably wide. After Mr. C. H. Russell, K.C., had been heard on behalf of the defendant, Mr. Justice Collins in giving judgment said he saw nothing in the covenant which afforded sufficient ground for declaring it void in law, and the judgment of the Court below would therefore be reversed, and the appeal allowed with costs. Lord Justice Stirling concurred.

Secco Films (British and Colonial) (Limited).—A winding up order having been obtained against this Company, meetings of the Creditors and Shareholders were held last week at the Board of Trade Offices, Lincoln's-inn.—The Chairman said that the Company had not a long existence. It was registered on July 28, 1899, with a nominal capital of £100,000, divided into £1 shares, and was formed to acquire the British right in respect of the inventions of Oswald Moh, of Gorlitz, Germany, for improvements in and connected with photographic ("Secco") films, and to carry on the business of dealers in photographic apparatus and materials. By the purchase contract which was entered into in August, 1899, the vendors, Messrs. Whitney, Graaff, and Co., who were stated also to have been the promoters, sold to the Company for a consideration of £80,000, payable as to £46,667 in cash, and £33,333 in fully paid Shares, the English and Canadian rights of a patent granted to O. Moh and others in respect of inventions relating to photographic films, the benefit of all improvements by the patentees, and the right to apply for and obtain letters patent for the British Colonies. The prospectus invited subscriptions for 66,667 Shares, and contained a statement that 20,000 of the issue would be appropriated to provide working capital and for the purchase and erection of plant. Applications were received for 12,497 Shares, and 9574 were actually allotted. The payment of the purchase price was ultimately satisfied by the payment of £1500 in cash to the vendors and the balance in Shares. Eventually the amount of the working capital was reduced to £8000, and the Company acquired for the purposes of its business a lease of the Avern Mills at East Molesey. In the Official Receiver's opinion the Company from first to last never had sufficient capital. The statement of affairs in regard to creditors showed an unsecured indebtedness of £1826, and a surplus in assets of £247, with a deficiency to Shareholders of £88,043. Mr. Ravenscroft, Chartered Accountant, Old Jewry-chambers, was nominated as Liquidator of the Company, together with a Committee of Inspection. At the Shareholders' meeting no resolution was passed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
29	Bradford Photo. Society	*Intensification and Reduction.* E. Clough.
29	Camera Club	*Practical Hints on Hypo and the Fixing Bath.* Rev. F. C. Lambert.
30	Birmingham Photo. Society	Extraordinary General Meeting.
30	Rotherham	*Where to Spend a Summer Holiday.* J. C. Cox.
May.		
1	Borough Polytechnic	*Panoram Photography.* P. C. Cornford.
1	Edinburgh Photo. Society	Paper by Professor Ivison Macadam.
1	G.E.R. Mechanics Institution	*Instantaneous Work.* Mr. Bennett.
1	Woodford	*The Stereoscope, and How to Make Pictures with a Single Lens.* A. P. Wire.
2	Camera Club	*The Grand Cañon of the Colorado.* Dr. Tempest Anderson.
2	Hull	Monthly Meeting.
2	London and Provincial	Lantern Night: A. L. Henderson.
2	Röntgen Society	*Some X-ray Improvements.* James Cadett.
4	Borough Polytechnic	Excursion: Monk Wood (Epping Forest).
4	Hull	Excursion: Burton Constable.

ROYAL PHOTOGRAPHIC SOCIETY.

Technical Meeting.—April 23,—Major General J. Waterhouse, I.S.C., Vice-President, in the chair.

Mr. Chapman Jones, F.I.C., F.C.S., read a paper upon a simple and inclusive method of

Testing Plates.

Probably every user of photographic plates, he said, has felt the need for a more direct method of testing them than the mere observation of the results they give in their ordinary work. Sp attention in the last few years had been given by some ma to general sensitiveness, but as regards special colour sensitive photographers had still to be content with such descrip terms as "isochromatic," "sensitive to yellow," &c. The thickness a film also is only described by such terms as "thick films" "richly coated." But even if one has an exact description of a p the necessity for testing it is not obviated. The condition of pl varies in a number of ways and recourse must be had to actual t The methods of doing this, at present in vogue, require cumbers apparatus and are very tedious. What was wanted was a rapid easy method—a method by which a glance at the result shows the eral characteristics of a plate, further examination giving useful qu titative indications. The apparatus devised by the reader of the pa is intended to supply this want. It consists essentially of a sc plate, 4¼ by 3¼ inches, containing—(a) A series of twenty-five tint graduated densities. (b) A series of coloured squares and a strip neutral grey, the five being of approximately equal luminosity. (c series of four squares of special colours, each colour passing light f a definite portion of the spectrum, and (d) A square of a line design which is superimposed a half-tone negative. A quarter-plate of brand to be tested is simply exposed behind the screen for a seconds, developed, fixed, and washed. Simple examination of the plate will show—Sensitiveness, or speed range of gradation; poss range of exposure; sensitiveness to colour; comparative size of gr of plate; amount of halation; the most suitable light for developm By further exposures, the instrument may be employed for the tes and adjustment of developers, testing media for dark room illum tion, the examination of light filters, testing plate backings, &c. great advantage of the device is that it enables a photographer ascertain speedily and without trouble the comparative usefulness of various brands of plate for his own special purpose, and the record tained is a permanent one, always ready for reference. The light u for speed testing is that of the parliamentary standard candle which not scientifically accurate as a constant unit of light, when used w common care, introduces no very marked discrepancies. The car has been adopted because of its simplicity, but other forms of stand light may be used, the best perhaps being the Harcourt 10-ca standard Pentane Argand.

Mr. Chapman Jones described the method of making the tests, bu is impossible to follow him at great length in this report. Sensitiven or speed, is found by exposing the plate for such a time that nearly the squares of the graduated scale are visible on the plate. For ordin landscape or studio work it is best to note the number of the thinn impression of the graduated scale that is sufficiently different fr the next denser square to show a practically valuable difference in print. With some work where a mere record of effect in shape needed, gradation being unimportant, the last number visible sho be read. The difference of about two numbers indicates that the pl showing the higher number is twice the speed of the other. Sensiti ness to colour is determined by comparing the densities of the patc produced under the blue, green, and two red squares. By roug matching these squares on the series of tints their proportional val are ascertained.

Mr. Chapman Jones showed upon the screen a large number of t plates exposed behind the new testing device, and explained the ch acteristics of the plates as indicated by such tests. A discussion ens in which testimony to the value of the instrument was freely offered those who had worked with it, and several small points were clea up. Those interested in the subject further should certainly cons the full paper which will appear in the Society's journal in due cours

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATIO

April 18,—Mr. A. Haddon in the chair.

Mr. Harold Baker gave a very interesting lecture upon "Warwi and its historical associations. The pictures shown in the first p were illustrative of the lecturer's remarks about the strong defens character of the old castle. Before the introduction of artillery place must have been a remarkably safe refuge. The castle was bu upon the solid rock and was absolutely safe from undermining. C side was the deep water of the river Avon, and in other directi towers and walls offered obstructions to the assailant. In addition these defensive works, there was the over-hanging balcony from whe molten lead or stones could be hurled; loopholes for catapults and gu the portcullis with its stone counterpoise, all of which contributed to strength of what it must also be agreed is a strikingly handsome a picturesque structure. The introduction of cannon, however, revo tionised the building of castles, and, of course, the strength of place now is a thing of the past. Photographs of all aspects of great tower were shown, and later some pictures within the walls a the buildings. The courtyard is occupied by some sixty or sever peacocks. In December 1871, when the castle caught fire, many fi works of art were destroyed. Fortunately only the more modern p of the castle suffered. The great hall was practically burnt out, and photographs shown present it in its new form as rebuilt. The su of armour and the collections of arms have much interest and ma anecdotes attaching to them. Some very fine pictures hang at Warwi including some of Rubens, Vandyck, and others. From the windows the great hall fine views of the park and the river are to be se The old bridge of thirteen arches is a mass of ruins overgrown w shrubs, &c., and makes a very pretty picture. It was built in fourteenth century. Market tolls were levied for three years to pay

out the arrangement had to be extended for nine more before the nses were fully met. The new bridge saved a very long journey , was involved by the use of the old bridge. Mr. Harold Baker ved two photographs of Lady Warwick in the castle. By her lady- 's kindness he was able to photograph in many parts of the buildings grounds not usually seen by the public who, he considered, should extremely thankful to the Earl and Countess of Warwick for their siderate treatment of them even when in residence, allowing them hey do, a wide run of the place. The castle was the best preserved all our feudal castles, and was full of attractions which all should

vote of thanks was passed to Mr. Baker.

PHOTOGRAPHIC CLUB.

RIL 17,—Mr. Hans Muller in the chair.

Ir. F. A. Bridge gave some details respecting the "cylinder" method blue printing from plans, &c. The plan is placed round a glass nder, or two half cylinders in a mahogany frame, and behind t the paper. Then a layer of felt is pulled over both with straps, ellent contact being secured. An arc light, worked by a pendulum, lowered into the cylinder to print the paper, and the method was that was coming into wide use. The cylinder he saw in use was feet in diameter, so that a large plan or drawing could be copied y easily.

Ir. Bridge also passed round some prints of the exterior and interior the Town Hall at Oxford, where the Convention will this summer e its meeting.

orth Middlesex Photographic Society.—April 22, Mr. S. Bard in the chair.—Mr. W. Kilbey gave a lantern-slide lecture on "igh Speed Shutter Work." He showed the Thornton-Pickard focal ne shutter, and the Anschutz camera, also with a focal plane shutter. le of racing, jumping, diving, &c., were shown, also subjects taken a much slower speed. The majority of subjects shown were taken at four-hundredth to one eight-hundredth second.

Hull Photographic Society.—The following extracts are taken from Eighteenth Annual Report of this flourishing Society: "The iety's excursions last summer were of a most successful and enjoye character, and the council would strongly recommend members to il themselves of the opportunities offered in this direction, the social ment in connexion therewith being by no means the least of the adntages. Driffield has again been visited, and as a mark of appreciaon of the kindness of the various land-owners in allowing members to their private foot-paths on this, as well as on so many previous asions, several members who participated in these privileges, pre- red enlargements representative of the district, which were presented the gentlemen named. Holderness Survey.—Your council are pleased report that the special effort which has been made this session to ther in all the existing Holderness Survey Prints, has been fairly cessful, the result being exhibited at the Society's Rooms, on Feb. and 8 of this year. A large number of members and friends inected the prints, which were of splendid quality. Steps have been ken to forward them to the proper authority, by whom they will ally be deposited in the British Museum. Exhibition.—It is intended hold an exhibition of pictures and lantern slides in December next. he council would therefore earnestly impress upon members the imrtance of keeping this in mind during the coming summer, and trust at each will do his utmost in order that our previous efforts may be rpassed. The Society can claim the honour of having had a picture one of its members (Mr. Potter), exhibited at the Royal Photographic ciety's exhibition last autumn, which was favourably commented on the various photographic journals, and readily found a purchaser. arnerke Fund.—In response to an appeal for subscriptions in aid of e widow and daughter of the late Mr. Leon Warnerke, whose work in e interests of photographers is well known, a sum of £2 10s. was ised and forwarded to the treasurer of the fund, the same being very uch appreciated."

Leeds Camera Club.—April 20,—Mr. C. B. Howdill, A.R.I.B.A., gave lecture on colour photography. He commenced by showing that solled colour photography was based on the photographer being able to produce all the colours of the solar spectrum by means of the three imary colours—red, green, and blue. A beam of light from the lanrn was broken up through a carbon bi-sulphide prism, and the action screens in cutting out certain portions of the spectrum was well illusated by a set of Mr. Sanger Shepherd's light filters. Mr. Howdill lly explained the Joly process and showed a number of slides of still- e studies and several exteriors of Ripon and Beverley Minsters ken by himself. He then proceeded to explain the Sanger Shepherd ocess of colour photography, going fully into the details of the taking id developing of the negatives, and afterwards the various processes in e preparation of three-colour slides. His remarks were well sustained y a fine set of slides, a number having been prepared by himself, otably a good reproduction of "Boers Carousing," a picture said to be Teniers. A brilliant slide of a poster was shown, which the speaker id was the easiest he had prepared, having gone through from exosure to finished bound up slide without a hitch of any kind. A umber of slides representing stained-glass which had recently been hibited at the Royal Photographic Society, were projected on the screen, and, according to a stained-glass artist present, could not be improved upon in the true reproduction of the various colours. In the taking of some of the examples the use of the tele-photo lens was a necessity; Mr. Howdill being the first we have heard of who has used that lens in the production of colour records. The finishing slide of Marske Hill was highly spoken of by Mr. Tindall, R.B.A., Secretary of the Yorkshire Union of Artists, who proposed a vote of thanks which was ably seconded by Mr. Beevers, President of the Huddersfield Photographic Society.

Newcastle Photographic Association.—April 12,—Mr. T. Maltby Clague gave a lecture and demonstration on X-ray photography. Mr. Clague used one of Professor Jackson's improved tubes to give off the X-rays, a tube in which the impenetrable platinum was placed at an angle so as to throw off the rays on to the required object. He passed the rays through several objects which were at hand. There was the bulky BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, which we are assured is barely looked through in the course of a twelvemonth, but which the photographers present were privileged to look through within as many seconds. The Bible was similarly treated, and if there were present any of those methodical people who make a practice of reading right through the sacred Book at least once a year, they must have been shocked at arriving at Revelations with such consummate ease. With a touch of humour the lecturer had placed a bawbee between the pages in order to sharpen the vision of any Scotsman who had profited by the free admission. The chairman also allowed himself to be utilised for a living experiment, and as the rays were passed through his hand and arm, the corresponding parts of the skeleton were plainly seen. One curious result was that of a pair of spectacles seen through a case, in which the glass proved opaque. Mr. Clague commented on the difficulty of obtaining the tubes sufficiently rarefied to suit exactly the work in hand. In the absence of text-books it had been a matter of acquiring practical experience at sometimes infinite patience and cost. One thing they had found out was that in X-ray photography they had been seriously and enormously over-exposing. Another interesting thing he had found was that by resting a tube after it had been in use for some time, they could bring it back to its original state of rarefaction. In this way they had the means of modifying their tubes according to the work required. The lecturer showed several radiographs of snakes, fish, hands, and a frog, the latter, according to Mr. Clague, being expressly made to be photographed by the X-rays, whatever else it was created for. (Laughter.) In one of the X-ray photographs, that of a snake that had long been dead and preserved, there could plainly be seen the remains of the reptile's dinner in the bones and bill of a little bird. Further towards the tail the X-rays disclosed some other remains of food which the lecturer humorously suggested might be its breakfast. The commissionaire at the Y.M.C.A. submitted to the X-rays the stump of his right arm which had been shattered by an elephant bullet during the Matabele campaign, and the present appearance of the bone was plainly seen. But the lecture all through was interesting, apart from its value to electricians and photographers, who were amongst a somewhat general audience.

Patent News.

THE following applications for Patents were made between April 9 and April 13, 1901:—

PHOTO-MECHANICAL PRINTING.—No. 7300. "Improved Manufacture of Photo-mechanical Printing Plates." Complete specification. LÉON JOSEPH BISSON.

STEREOSCOPES.—No. 7333. "Improvements in Stereoscopes and similar devices." Complete specification. HENRY EMSLEY RICHMOND.

LENSES.—No. 7417. "Improvements relating to the Correction or Variation of Spherical Errors in Dioptric Lens Systems." Complete specification. CARL PAUL GOÉRZ.

LIGHT FILTERS.—No. 7440. "Improvements in Light Filters, or Screens for Photographic Purposes." HENRY RHEINLANDER.

LENS MOUNTS.—No. 7511. "An Improved Lens Attachment for Cameras." FRANK ROWELL ROACH and DANIEL LESTER TEED.

CINEMATOGRAPHS.—No. 7650. "Improvements relating to Cinematographs." ACHILLE VICTOR EMILE DAUBRESSE.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHY AND THE FOURTH COMMANDMENT.

To the EDITORS.

GENTLEMEN,—Your correspondent, "Six Days a Week," has missed or evaded the point at issue. I did not question either the obligation

of "The Sabbath" on the Jews, or the rigour with which the law was enforced. I stated that no such obligation exists for Christians, and am not in error in saying there is no Scriptural authority for imposing it on them. As a practical proof of this fact, I have repeatedly offered to subscribe £5 to the funds of any religious or charitable society selected if a single Scriptural authority be produced making the observance of the Sabbath binding on Christians. My subscription has never been claimed, and cannot be, as no such authority exists, and, in its absence, those who seek to make "Sabbath-keeping" binding on the consciences of others under the pretence that it is Divinely commanded are simply "teaching for doctrine the commandments of men."

There is a touch of the ludicrous in "Six Days a Week" mixing up "Sunday workers" with Exodus and its enactments. Sunday and the Sabbath are totally distinct, and the latter was, and is, an exclusively Jewish institution, as he will find if he reads carefully the account of its promulgation, as a sign of the Covenant between God and "The Children of Israel."

Your correspondent can, of course, if he likes, adopt the law of the Sabbath for his own use, as he can circumcision or any other Jewish rite, but it is quite another matter when he seeks to make such ceremonials binding on other people.

Many thanks for his offer to correspond with me privately on the subject. If he wishes, I have no objection; but he will hardly produce any evidence which I have not long since exhaustively considered. "Let every man be fully persuaded in his own mind."—I am, yours, &c., J. H. W.

April 19, 1901.

To the EDITORS.

GENTLEMEN,—Re the above subject, I think photographic assistants are quite right in asking for the abolition of Sunday labour. Surely nowadays (when there is hardly a business but has its day for early closing) people can find plenty of opportunities for visiting the studio on week-days.

Were masters to close, I am sure they would lose nothing in the end, for they would get better work from their assistants, and get it done more willingly and cheerfully than is the case at present.

Hoping something will be done to put an end to Sunday labour all over the country.—I am, yours, &c., A SUNDAY WORKER.

THE NEW COINAGE.

To the EDITORS.

GENTLEMEN,—On page 169 of yours of March 15, I see a paragraph regarding the likeness of our new King to be put on the coins and stamps of the Empire. I would suggest that on at least half the different kinds of stamps and coins the likeness of our new Queen should be displayed. As you say, photography can supply them, and there are so many pictures in existence of Her Majesty's lovely face that a different picture could be used for each different value of stamp.

I really don't see why our stamps shouldn't be little works of art—vide the recent issues of New Zealand stamps, and I offered to compile a set for India, but the authorities declined. A very artistic set could be produced, showing the best bits of architecture and scenery and a few typical native heads.—I am, yours, &c., F.D.

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—I have the honour to inform you that His Majesty the King has been graciously pleased to signify his willingness to become a Patron of the Royal Photographic Society, a position which, as Prince of Wales, he filled from the time of the death of His Royal Highness the Prince Consort, in company with her late Majesty Queen Victoria, who honoured the Society with her patronage from the year 1853, when the Society was founded, until the present year.—I am, yours, &c., A. W. W. BARTLETT, Assistant Secretary.

66, Russell-square, London, W.C., April 17, 1901.

THE EDUCATION OF PHOTOGRAPHERS.

To the EDITORS.

GENTLEMEN,—I shall be much obliged if you will insert the following note in THE BRITISH JOURNAL OF PHOTOGRAPHY, respecting the statement by Mr. T. Everitt Innes in the JOURNAL of April 12, to the effect that those attending the various schools of photography are mostly amateurs. I beg to say that the whole of the students attending the evening school at this Institute, some 200 in number, are professional photographers, and have been for some years past.

Also in the day school, at least two-thirds of our students are professional workers, in many cases principals. I need hardly say that our books are open to the inspection of an official appointed by the newly formed Professional Photographers' Association, and would probably be a revelation to them as to the proportion of leading workers who are past or present students of this school.—I am, yours, &c.,

HOWARD FARMER.

Polytechnic School of Photography, 309, Regent-street, W.,
April 16, 1901.

MESSRS. GRIFFIN'S LECTURES.

To the EDITORS.

GENTLEMEN,—We have now made arrangements for the delivery of seven lectures on Photography by our demonstrators during the coming autumn and winter season before the photographic societies of Great Britain. In order to prevent disappointment, it is necessary to fix the dates as early as possible, and we shall therefore be obliged if you would make an announcement to this effect in your paper. The lectures are helpful and practical in character, and are given entirely free of any cost or condition. The titles of lectures are enclosed herewith.—I am, yours, &c., PRO JOHN GRIFFIN AND SONS, LTD.,

F. IBBETSON, Manager Photo Dept.

20-26, Sardinia-street, Lincoln's Inn-fields, London, W.C.,
April 19, 1901.

List of Lectures and Demonstrations. Season 1901-2.—(1) Modern Developers: their influence on the negative, and the subsequent processes; (2) Working demonstration of Velox and Carbona papers; (3) A comparison of the warm tones on Carbona P.O.P, and on the various development papers; (4) Special Velox Processes; and pictorial postal and greeting cards; (5) On the claims of Velox as being adaptable to any kind of negative; (6) The impressionistic tendency in artistic printing papers, and their effect on Pictorial Photography; (7) Negative Making: a plea for selection of developer to suit the subject.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—You kindly sent me an invitation to be present at the meeting held on March 28, at which the Professional Photographers' Association was formed. I regret that it came at a time when I was exceptionally busy, and therefore was unable to attend. I have now found time to read my BRITISH JOURNAL OF PHOTOGRAPHY, and wish to express my sympathy with the movement, my thanks to you for the invitation, and my best wishes for a long and successful career to the Association.—I am, yours, &c., EDGAR SCAMELL.

120, Crouch-hill, London, N., April 19, 1901.

To the EDITORS.

GENTLEMEN,—Please enter my name for membership in the Photographers' Association.—I am, yours, &c., C. J. EMENY.

Walton, near Ipswich, April 15, 1901.

To the EDITORS.

GENTLEMEN,—Please add my name to the Association of Professional Photographers. Have read with great interest your article, and also your correspondents' letters, and sincerely hope that something more than "Smoke" and "Bubbles" will result.—I am, yours, &c.,

W. FROST WILSON.

Gold-street Studio, Saffron Walden, April 16, 1901.

To the EDITORS.

GENTLEMEN,—I am pleased indeed that your efforts to bring the profession together for mutual protection have met with so large a measure of success. With such a list of names as forms the Provisional Committee, something ought to be done. But what? Ay! there is the rub! However, the seed is sown; but past sowing of like seed with which I and others, including the late Thomas Fall, were interested, brought little fruit. We can but hope that this seed will be better nurtured, and fall on more productive ground. One great mistake has, I fear, been already made, but it can be remedied, viz., the subscription of 5s. is much too low. Nothing can be done without cash. It

ht to have been fixed at 21s. Then, backed up by the valuable sup- of our JOURNAL and your pen, things would have looked more business. Please find enclosed my cheque for 21s., my year's sub- ption, and enrol my name as a member.—I am, yours, &c.,

W. BARRY.

and 8, Park-street, Anlaby-road, Hull, April 20, 1901.

We are very much obliged to Mr. Barry for sending us the cheque one guinea, which we have handed to the Hon. Treasurer of the ociation, Mr. William Grove, 63a, Baker-street, London, W., who , no doubt, be glad to receive other contributions towards the iminary expenses of forming the Association. With regard to smallness of the subscription—five shillings—the Provisional Com- tee in so fixing it had in view the desirability of making the ual payment so low as to be well within the means of all tographers. But this and other points will, no doubt, come ore the first General Meeting of the Association, which will proba- be held in July next. Meantime, a sub-committee is busily en- ed in drawing up a general scheme, rules, &c., which, we believe, l be brought officially before the whole of the photographic pro- sion at an early date.—EDS. *B. J. P.*]

To the EDITORS.

GENTLEMEN,—Herewith I beg to hand you a copy of rules of the erdeen Association. I am pleased to note in this week's JOURNAL t your efforts have been successful in arousing the profession oughout the kingdom, and trust every photographer will find it to interest to co-operate with you in the national movement.—I am, rs, &c.,

JOHN S. GREENACRE, Sec.

101A, Rosemount-place, Aberdeen, April 22, 1901.

We congratulate our Aberdeen friends on the promptitude with ich they have formed their association; and we hope that when the l scheme of the Professional Photographers' Association, which is w in preparation, is publicly issued, they will "fall into line" h the rest of their brethren in all parts of the country.—EDS. *J. P.*]

DR. GRUN'S NEW LENS.

To the EDITORS.

GENTLEMEN,—In answer to the numerous inquiries which your kind tice has elicited, I beg to point out that a lens working at *f*-1 to ver a phole-plate must be twelve inches in diameter. This rapidity not necessary except for very rapid exposure in bad light at night, en a lens of *f*-1 will give a fair impression, with the light of one candescent burner at quarter-second exposure. A lens working at 2, although it will need four times the exposure, need only be half e diameter. A consideration of these facts will save the answering a large number of letters. A six-inch lens is a practical possibility, t I am not at present certain if a twelve-inch lens is possible, whilst any case it would be a very unwieldy piece of apparatus.—I am, urs, &c.,

EDWARD F. GRUN.

The Hall, Southwick, Brighton, April 22, 1901.

THE POISONS ACT.

To the EDITORS.

GENTLEMEN,—Referring to your article, "Apologists for Monopoly," ere is no such thing as "the pharmaceutical monopoly." The medical ofession can legally, and do constantly, sell poisons.

I fail to see how I have given my case away. You say the Phar- acy Act does not at present permit the oilman to prove his ability. here I entirely disagree with you. The main business of the Phar- acy Acts is, presumably, to differentiate between the fit and the unfit. With regard to carbolic acid, I am sorry now I did not preserve your st article, for after a good laugh I put it on the fire. According to y recollection, you stated that the public pay a higher price to the ruggist for an inferior article than they obtain from the oilman. his week you say the oilshop article was usually "cruder" than the commercial" acid. We shall all agree with that. But what was e worse article that the naughty druggist sold at the fancy price? ell me that, and I will forgive you all. I respectfully submit that, ven for purposes of argument, one of the largest wholesale chemists not exactly the same person as the retail oilman.

The oilshop acid usually contains about five per cent. of carbolic acid. Whether this is a better disinfectant than "the purer kinds" should not be a difficult question to decide.

I am glad you can well imagine this week that the Pharmaceutical Society's law account is on the wrong side of their balance-sheet. But you tried to make us believe in your last article that the Society made a good picking out of it.

Experience shows that accidents are more likely to accrue from poisons being distributed by unqualified persons than by those who have knowledge and experience of these deadly articles. Let me remind you of the large number of deaths which have occurred through carbolic acid being supplied by oilmen in beer bottles.

"Fair Trade" can already get all he wants, with one exception. He can pass an examination under Government control, and then sell poisons. But the examination is not simple. He will have to burn the midnight oil for a long time, and it is rather costly. That is, however, how the chemist has gained his envied position, and he would naturally resent any proposal which would allow others to compete with him on dissimilar terms. Wouldn't it be as well to repeal the Pharmacy Act and its relations, and let us all sell what we like? It would be very inconvenient, after buying your poison from the photo dealer, to be obliged to go elsewhere for your death certificate before you could be buried. It is obviously unfair that qualified medical practitioners should hold this monopoly. No doubt the dealer would be glad to supply them at store prices, to the public benefit.

I hope you won't think I have an axe of my own to grind. My nearest opponent, both chemical and photographic, is seven or eight miles away from my poison depôt.—I am, yours, &c.,

Wiveliscombe April 20, 1901. J. OSBORNE.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED:—

C. Thorburn, 1, Stockwell Park-crescent, S.W. *Photograph of dog with biscuit round its neck.*

MISS W. (Liverpool).—The "Moniteur de la Photographie," published at 55, Quai des Grands Augustins, Paris.

R. RAY.—If the distemper background has dried glossy, instead of dead, it is clear that far too much size was mixed with the colour for the surface it was put upon. If that were a painted one less size should be used, than if it were merely a plain fabric.

LITHO PAPER.—T. CROSBY asks "Where he can obtain some paper, coated with plain gelatine like single transfer (carbon) paper, but without alum, and in long rolls?"—In reply: The Autotype Co., we believe, supply such a paper, but whether they keep it in stock we are not quite sure, we think they do.

PHOTOGRAPH OF THE LATE MR. PARNELL.—C. J. SWIFT writes: "I would be obliged if you could inform me as to how I could get a photograph of Charles Stewart Parnell, which was taken by a W. Lawrence? Could you tell me his address?"—In reply: Mr. Lawrence's address is 5, 6, and 7, Upper Sackville-street, Dublin.

MICRO-PHOTOGRAPHY.—"MICROSCOPIC" writes: "Can you inform me where I can get a photograph copied for a microscopic charm?"—In reply: We regret we are unable to supply the desired information. These little pictures are mostly done in Paris in large quantities at a time, and we do not know any one here who would undertake to do a single picture.

IRON PIPING FOR DARK ROOM WATER.—"AQUA" writes: "I have to carry water from my house to the dark room, a distance of about fifty feet, and as the cost would be very much less if the pipes used were iron tube instead of lead, do you consider that the use of this iron pipe would cause any serious difference to the purity of the water for my photographic purposes?"—In reply: Lead piping would be preferable for the purpose. But all the water from the water works to the house supply pipe is conveyed through iron pipes. If you use iron pipe from the house to the dark room it will be well, if the water is not in constant use, to let it run for a few minutes, to wash it free from any oxide that may have accumulated before you take it into use. By doing that we surmise you will meet with no trouble.

THE TELECTROSCOPE.—"ABERDEEN" asks: "What is the name of the apparatus invented by Jan Szczapanik (a Pole), in 1898, for sending pictures of objects by wire? How are the pictures reproduced? Is there any printed matter on this subject, if so, what, and where may it be obtained?"—In reply: Our correspondent refers to the Telectroscope, a full description of which appears at page 875 of our ALMANAC for 1899.

COPPER IN A GOLD SOLUTION.—W. H. R. writes: "I have dissolved a sovereign for toning purposes; will the copper that it contains do any harm, if so, will you tell me how to get rid of it?"—In reply: The small amount of copper will do no harm, practically, and it would not be worth the trouble to get rid of it. The next time you make chloride of gold we should advise you to use an Australian sovereign. They are, or used to be, alloyed with silver.

COPYRIGHT.—"SWIMMER" writes: "Last summer I photographed the committee of a swimming club; but received no money. The secretary ordered fourteen copies, which he got, and has not paid. Instead, they had a block made from it and printed on an entertainment programme. Could I now copyright it, and take action against the president, as the secretary at that time has now left Glasgow?"—In reply: You can register the photograph now, but it is doubtful if you can recover.

G. ROSEN.—STUDIO BLINDS.—The fabric for the top blinds will do very well. As the studio faces south-west we should prefer the sample marked "C," because it is darker in colour than the others. As regards the side curtains we, like you, should prefer the "3," but we have our doubts about the dye standing the strong south-west light for long, without its fading. No. 4 is a suitable colour and, in all probability, the colour is a fairly stable one, and for that reason would, perhaps, be the best to decide upon.

A COPYRIGHT QUERY.—"INQUIRER" writes: "I am going to employ an operator, who is out of employment just now, to take some cricket groups for me, I supplying camera, &c. I shall not be with him when they are taken as they have to be done a long way from here. Can you tell me how I am to secure a firm copyright in them?"—As the operator will, in this case, be the author of the picture the copyright must be registered in his name. Then he will have to transfer the copyright to you. You should make an agreement to this effect with him when you commission him.

LENS.—H. COLE writes: "I have a portrait lens offered me for a very small price. It is about two and a half inches in diameter and about seven inches back focus. In the hood are two other lenses which, I presume, are for some other purpose, as the combination seems complete without them. The lens bears the name of 'Derogy, Paris,' and I believe it is of somewhat old make. Can you tell me anything about it, and whether it is worth buying at a small price?"—In reply: We know the lens well. It was introduced by Derogy some thirty or forty years ago. You will find that the two supplementary lenses will fit between the components of the combination. One is to lengthen its focus, and the other to shorten it. If you have any use for such a lens, and can get it for a small price, better buy it. It has little commercial value though it may be a good instrument.

COPYRIGHT.—"IN DOUBT" writes: "I intend publishing Local View Books of various districts, and in order to prevent the collotype printers from supplying other dealers from my negatives, how should I proceed? (1) Should I copyright every view separately, or, could I copyright the book as issued, or, copyright only one or two views in each book, as to copyright every view in say twelve different books of twenty views in each would be a deadly item. I may mention that I have been done in this manner before, and naturally do not want it repeated. (2) Would the views require to be marked copyright before you could raise an objection for damages for infringement?"—In reply: (1) Yes, each view should be made copyright. As to the cost, that is an item. But if even one or two of the pictures were pirated you would probably be enabled to recover damages that would cover the outlay for copyrighting the whole lot. (2) No. It is not necessary—though advisable.

LENS QUERY.—"SEEKER" writes: "(1) Trust you will not think following question too simple, but failing myself to understand it, should be glad if you would enlighten me. In a lens made to take Waterhouse stops, of course there is an opening left in lens for insertion of stop. Now, when using open aperture, does not the light through opening tend to very much fog a plate? Of course, I am presuming the cap or shutter used on the front of lens. I am asking as I have noticed light does filter through the stop slit. An explanation would be much esteemed. (2) Also, what is the usual charge for hire of twelve by ten camera?"—(1) With all lenses a diaphragm is supplied the size of the full opening, to be used to keep out the light when smaller stops are not employed. If you have not one with your lens slip an indiarubber band on the mount and that will keep the light out of the slot. (2) We are not aware that there is any universal charge. Better communicate with those who let cameras out on hire—saying the size you require, and for how long.

COPYRIGHT.—J. H. writes: "Some time ago I photographed a curio in the form of a potato growing through a ring, for a farme this district. The farmer sent a copy to the "Strand Magazi for publication for which he received 10s. 6d. I have now rece an application from a lady in America (who is writing a book Curiosities in Nature) for copies of the photograph. I wish know if I am involving myself in any question of copyright supplying them to her?"—In reply: Legally, No; as copyri does not run in America. If the farmer paid you for work no doubt you can come to some arrangement with him.

COPYRIGHT QUERIES.—F. H. KINGSTON writes: "Some few months I photographed some theatricals; no money was paid me, t stated if they turned out satisfactory I should have an or (I may say it was at my proposal they were taken), but have had any order or heard further from them. Can you inform (1) If I am at liberty to give away or sell any of the photograp (2) If I take any one for nothing who does not promise an or have I the right to sell or give away same? (3) If I take a per for nothing and give them a copy, and some time after they or some and pay for same, do they have the right of preventing either selling or giving prints away, or does it still remain w me, and can I copyright those done for nothing without sitt consent? (4) If I take a person in the usual way (cash with ord can I have the photographs copyrighted myself, or must I have co sent of persons in writing?"—In reply: (1) Yes. (2) Yes. (3) A kno point; probably in such a case copyright would belong to yo but we cannot quote a case. (4) The copyright is not yours: y must have an assignment in writing.

SPOTS ON PRINTS.—D. IRELAND writes: "I shall esteem it a great fav if you will answer me the following questions—(1) What are t white spots caused by on the enclosed pieces of photograph, a they caused by impure mounts? The photograph has been mount seven months, it was mounted with ——'s mountant, and w free from spots when finished. I toned and fixed it with a more prints; all prints mounted on this class of mounts a covered with spots, prints from the same batch, mounted on oth makers' mounts, are all right. (2) If mounts were guarante pure can I claim damages for about two gross of photograp returned by customers, these I have had to replace?"—In repl (1) We cannot say the cause of the spots or whether they are d to the mounts or not without testing them, which, of cour is without our province. If, as you say, other prints produced the same time and under like conditions, and mounted on oth mounts, have not become spotty, it would look very much as the mounts were at fault. (2) Yes, if you can prove that t mounts are the cause of the trouble, and they were guarante pure.

A PATENT QUESTION.—"AN INVENTOR" writes: "(1) Some few yea since I gave an order to an old established firm for a whole-pla camera of their special design; I also instructed them to ac what I considered to be an improved addition which I have sin found to be valuable improvement. The camera was construct and a most beautiful instrument it is. Being very proud of it, showed it to many of my friends, including several well-know dealers. Lately I have learned that an old-established firm ha placed upon the market a patent camera, having a similar in provement that I have in my camera. Would you kindly say you think the firm can claim a patent; also, can they in any wa cause me annoyance by action? I may say that I have not ha my improvement placed on the market, nor have I any intenti of wanting to patent it. (2) Do you think it would be advisa to remind the firm in question?"—In reply: (1) If the invention yours, and you have used and shown it publicly, the patent, course, is invalid. The "Patentee" can in no way interfere wi you or cause you any annoyance. (2) No; unless you think worth the trouble to tell them that their so-called patent invalid, as the camera is an old invention of yours.

STUDIO-BUILDING.—"STUDIO" writes: "(1) I am thinking of buildin another studio, and should be glad if you would give me advice Could the enclosed plan (not to scale) be improved upon? Th fourteen feet high side is built against a dead wall, on the othe side of studio two feet of brick, the remainder five feet of glas Are the proportions of right dimensions? Is there any other for of studio you would recommend in the place of the one I enclose The whole is ground glass, and the studio is thirty-two feet long and twelve feet wide. (2) Could you give me the name of an publication dealing with the building of studios? (3) Would th 'dead' side of the studio papered an artistic terra-cotta colour and the woodwork painted white, in any way interfere with th lighting of the subject; and, if so, what colour would you recom mend combining artistic effect with suitable lighting of subject? —In reply: (1) It would be better if the glass at the sides were si feet six, or seven feet instead of five high, and instead of having the whole glass, about five feet of each end would be bette opaque. (2) Bolas' work on Studio-building, Marion and Co (3) Yes, but it would be preferable not to have the woodwork white. A pale green or a French grey would be better.

*** We are again obliged to hold over many answers to correspondents, and other communications.

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EX CATHEDRÂ.

etalline" tographs.

With premises at 45, New Bond-street, and works at New Southgate, the Metalline pany propose bringing prominently to the notice of h public and professional photographers the interesting ess of printing commercially introduced by Mr. F. lé, a year or two ago. So far as we can judge by the y specimens that have been submitted to us the method rinting adopted is a modification of the "powder" process, ges in finely deposited metal (gold or silver, it is to be osed) being thus obtained. Two specimens, gold and sil- photographs on an imitation ebony ground, have been in possession for three years without having deteriorated he least. In the interim Mr. Ahrlé has been able to rove the process, especially in its rendering of half-tone, wooden and metallic plaques, watch cases and cigarette s can now be impressed with beautiful and permanent tographs in gold, silver, copper, &c. At the Bond-street gallery there is a large and varied exhibition of portraits, landscapes, and reproductions that have been made by the process. We understand that cabiñet-sized plaques will be accessible to photographers at a few shillings apiece, from prints supplied, and thus these pleasing metallines will be brought within the reach of the public at a low cost. The process, as we have said, is characterised by beauty and permanency, elements which should make it popular, and it is also of very considerable decorative value: so that the results have every chance of securing wide recognition. We wish Mr. Ahrlé and his associates success in their efforts to make this branch of photographic printing appreciated by "the classes and the masses." One of the commonest aspirations of the professional photographer is for novelties, and here, in these metallines, we have something that must strike the greater part of the public as new. It may be mentioned that some specimens of this process have for some time been in the possession of the Royal Photographic Society: and at one of the latter body's meetings at the end of 1887, they were passed round amongst the members. On that occasion Mr. John Spiller gave a brief description of the process, and spoke highly of the results. No doubt the company's show of specimens in Bond-street will secure considerable public admiration.

* * *

The Bolt-court Technical School.

The official title of this well-known institution is now the "London County Council School of Photo-engraving and Lithography," but it will be long, we conjecture, before those photographers who are interested in the work of the school will become reconciled to the change of nomenclature. We wish to thank the principal of the school, Mr. Charles W. Gamble, for the annual reports for the years 1898-1899 and 1899-1900. These are two sumptuous volumes. The illustrations in three-colour, collotype, half-tone, lithography, photo-lithography, and line on zinc, to mention most of the processes taught at the school, are the work of the students,

and very beautiful prints they make in the volumes before us. In the session 1899-1900, the number of individual students who entered the school was 229, and the total entries to the various classes amounted to 429. The classes, it may be mentioned, are only open to those professionally interested. From Mr. Gamble's remarks on the process classes we take the following extracts: "The lack of desire shown by process workers to obtain knowledge of principles stands in their way;" "It is unfortunate that process-workers, as a rule, pay so little attention to ordinary photographic processes: those who do, however, succeed the best;" "The tri-colour class . . . . has proved one of the most satisfactory in the school." But the record of the work done is, on the whole, gratifying, and encourages the hope that the L. C. C. school has a great future of usefulness before it. If we read the inner meaning of the reports aright, the Technical Education Board of the L. C. C. will welcome earnest students at the Bolt-court technical school. We congratulate Mr. Gamble on his work, and his Board on the endeavour to serve some of the best interests of English book-illustration.

* * *

Impurities in Rain Water. It is difficult to eradicate the popular notion that rain water is pure water; yet, a little consideration ought to show the fallacy underlying the idea. In the first place, if water in any quantity is to be obtained, there must be a large collecting area, which practically means the roof of a building. The collection of soot, dust, and bird excreta, must of necessity contaminate the collected liquid, and if it be collected only after the roof has first been well washed, absolute freedom from foreign matter cannot be expected, even in the open country; while in towns there is always in the air sufficient matter to produce serious contamination. But the last touch in the fabric of untrustworthiness has lately been given in a paper presented to the Chemical Society, by Mr. W. Ackroyd. "Well," say the upholders of the pure rain water idea, "at any rate in the open country we get after the first washings of the roof really pure water, and free from dissolved salts." But this idea is shattered by the paper in question. At the Widdop reservoir in Yorkshire they have been unable to account for the presence of common salt in the water, as it is collected from an area containing no salt whatever. The result of the investigation has been to show that all this salt—more than a grain to the gallon—comes from the rain water, and that in winter-time the proportion is still greater.

* * *

A Floating Telescope. In the monthly notices of the Royal Astronomical Society last month, there appeared a description, by Mr. B. Cookson, M.A., of a newly designed and built telescope at the Cambridge Observatory, which possesses many points of special interest to photographers. There are many novel features about this instrument, the chief being that its position is maintained by the whole apparatus being floated upon a trough of mercury, and that the records of special character that it is designed for, are by preference made by photographic means, to ensure exactitude and render the telescope free from error through the head or the body of the observer disarranging its position. The trough is an annular vessel in which floa another annular body, or float, with half an inch of clea ance all round. The telescope is attached to and suspende from the centre of this float. The weight of the mercu used is about one and a quarter hundredweight (whic would represent a little over a gallon in bulk). There ha been made hitherto only very few floating telescopes, fi being the total number believed to be in existence. Th object-glass consists of a Cooke lens, series 1c, with a focus 65.4 inches, and its performance is stated to be mo satisfactory, the star trails being wonderfully sharp a distinct. The construction of this form of lens is such th any disturbance of the focal length caused by temperature almost nullified by the change in the separation of the co ponent lenses brought about by the same cause. It is foun that the focus is altered just the one-hundredth of an inc for a rise of 10° C., which, according to Lord Rayleigh formula, is just the limiting distance possible, without i pairing the definition. Ilford plates, five by two inche are used, and metol is the developer always employed. Speci experiments were made to ascertain if any distortio of the film was produced in the various attendant chemic operations. It was found that they were negligible, th slight amount measured being dependent upon the eve ness and regularity of the application of the film to th plate. The exact amount in a scale 100 mm. long w 0.0071 mm.

* * *

Cloud Photography. The Director of the Meteorological Se vice of Canada has published an interes ing description of the cloud observations made at th Toronto Observatory, from which we are disappointed t learn that photography was found to be of little use, owi to the difficulty of keeping the camera in adjustment. W should have thought that with a suitable form of came such difficulties should not have been insuperable. Th value of photographic observations would have been much greater. A base line 1552 metres was measured, a an observer at each end was provided with a theodolite, t telescope of which were replaced with long axes fixed on t T's of the standard. The cumbersome method was adopt of fixing upon a particular point of a cloud, telephoning position to the observer at the other end, and on his iden fying it the two observers sight it at the same instant time, and repeat the operation at intervals of time, varyi from forty seconds to eight or ten minutes. With a came and a tele-photo lens, we repeat, the value of the observatio would be much greater, and the capabilities of the resul far wider in scope.

* * *

Antihypo. Dr. E. Valenta, of the Vienna Technic Institution, gives an account in the "Ph tographische Correspondenz" of a new preparation, whic has been submitted to him, for the elimination of hy from plates or prints. The substance is sold, under th name of "Antihypo," in the form of pastilles about thre quarter inch in diameter. After the plates or prints ha been fixed and rinsed for about two minutes they are place in a dish with water. A pastille is put in the dish, whic should then be rocked until the pastille is dissolved. Th

tes or prints may afterwards be rinsed in running water one or two minutes and set up at once to dry. Dr. lenta submitted the preparation to analysis and found ontained potash, small quantity of soda, carbonic acid, l a small quantity of chlorine. Heated upon platinum the substance melted and was found strongly alkaline, taining a large quantity of carbonate. In water it dis-ved rapidly with evolution of gas, and cooled down to a udy liquid with an alkaline reaction. If a very dilute ution of sodium hydroxide be used instead of water prevent the escape of the carbonic acid) and then ted, oxygen only is evolved. Acids caused a solution the preparation to effervesce. The addition of sulphuric d, until effervescence ceased, yielded a considerable ntity of peroxide of hydrogen. These reactions indi-e that "Antihypo" must be percarbonate of potash, as ained by E. J. Constam and A. v. Hansen by electroly-from a saturated solution of carbonate of potash at a nperature of ten to fifteen degrees c. The introduction the salt is an acquisition to photography, and its use uld tend to reduce the chances of fading from insuffi-nt washing, to a minimum.

ON GETTING INTO A GROOVE.

E of the most noticeable traits of humanity is its pro-nsity to being, as it were, overcome by environment, and ing and working along certain well-defined tracks, dually beaten out by use and custom. It seems always far ier for the individual to fall into habits and schemes of ing and doing, rather than to give full rein to his own ural independence of thought and character. This ten-ncy is very marked in the realm of art, and in those ocesses, such as photography, which are closely allied to a. It is astonishing how much we allow our judgment be moulded by surroundings and current ideals. As a d example of this, contrast Chinese or Japanese art with t of the West. It seems to our eyes conventional and true, and yet to the Asiatic mind the work of Western ists must undoubtedly appear equally strange. It is in her case simply the result of the powerful yet unfelt ion of environment, which gives rise in its broader effects the many different national artistic schools, and in a rrower sense of minor cliques and rings, taking their in-ration from some guiding spirit who has the gift of dership. One of the chief reasons for this propensity to velling in certain settled paths is imitativeness. Every e longs to do what some one else has been successfully ing, and so methods of work that in a master's hand, at the ginning, seem true and satisfying, become general and ditional among a host of followers. We will consider this estion simply as it relates to the practice of photography, d try to discover the advantages and disadvantages of s tendency to imitation. The unconscious habit of adopt-, to a certain extent, prevalent and accepted theories and als, may be in some degree beneficial, as, for instance, en it leads to the general reception of what are seen to the best and most effective methods of work, and the eschewing of glaringly vulgar faults in taste or technique. One man discovers that there is such a thing as the rendering of atmosphere and distance among photographic possibilities; the more intelligent workers quickly follow him, and then all the rest come flocking eagerly after, because it is "the thing." When the fashion so followed is good, then let us bless imitativeness, which helps to spread the light; but when it is the reverse, oh the pity of it! Another advantage of imitation is the way in which it leads many to adopt a good manner or style, by treading in the steps of some prominent worker they admire, and trying, themselves, to seize and render those characteristics of his work that have given him his name. In the majority of cases, this "sitting at the feet of Gamaliel" has excellent and profitable results, and helps to raise the general level of photographic achievement. In others, unfortunately, nothing but absurdity follows; incapacity tries in vain to soar at once above Parnassus, and falls ignominiously "on t'other side." There is a wide difference, too, between harmless and laudable imitation and mere copying, which certainly has nothing praiseworthy about it. The copier is just as likely as not to carefully preserve and perpetuate all the bad points and trivialities of his model, not having the necessary taste and skill to perceive wherein lies the real excellence of the work he admires.

One great disadvantage of following too closely in recognised tracks is the deadly sameness and monotony that so often results. We see the walls of exhibitions, sometimes, crowded with an array of otherwise excellent productions, so level in merit, so altogether tame and unoriginal, so obviously conceived and executed in one cut-and-dried spirit and intention that it is impossible to take any pleasure in them. Is it only fancy, or the dawning perception of a palpable truth, that has made many of us comment on the growing tameness and lack of special interest in some of our recent exhibitions? When good technique was less general than it is now, and more second-rate productions were shown, there certainly seemed to be greater attractiveness and vigour about our pictures, and we managed to feel a little more enthusiasm and admiration for those that excelled. Is it the old tale again, that the trend of the times is toward an abundance of talented mediocrity with but little genius, or would it be more truthful to ascribe it to over-imitativeness of that which is in itself good? Perhaps we spend so much time in seeking to equal the fine technique of our leaders, that we fail to grasp that which is above mere rule and formula, that inner feeling and soul which alone can save our work from being mechanical, lifeless, and cold. Another phase of imitativeness is the imitation of self. A worker produces something that wins a rich guerdon of success, and straightway proceeds to copy himself, by evolving a series of things in the same style and manner. The result of this is inevitable staleness and failure; the erstwhile leader in his little world falls from his high estate, and gives place to others of greater originality. Yes, after all, how much depends on this latter quality! It might almost be said that to be original is to be successful. The moment anything of merit or beauty in art or photography becomes sufficiently followed to be common, interest ceases, and honours wait for the daring

man who has something new to show. It is not always so, however. There are exceptions to every rule, and we find some people who fail rather from excess of originality than the lack of it. When they come, as once in a while it happens that they do, to the conclusion that a certain amount of time spent in learning from and imitating others may have its uses, the thorns begin to vanish from their path, and the difficult becomes easy.

We have spoken of the results of letting our work run into a groove; closely related to this is the fault of getting too stereotyped in our methods. Because we may find that we can obtain, on the whole, perfectly satisfactory results by our old favourite ways and formulæ, it by no means follows that there is no better way. Photography is nothing if not progressive, ever broadening out into wider possibilities, as our fuller knowledge, slowly and laboriously won, gives us new powers and greater opportunities. We need to be more experimental, and less easily satisfied. A dozen spoilt plates, wasted in trying some new developer, may be more worthy of our pride that a long array of perfect negatives, produced by a means we are so well accustomed to that failure with it is impossible. It is rather the fashion to smile at the man who experiments, a smile tolerant and pitying; but are not practically all the great conveniences and improvements we now use so willingly the result of such experiments? "A rolling stone gathers no moss," certainly—but sometimes it gathers something very much better! It is unwise to infer that because we deprecate getting into a groove we are therefore admirers of that butterfly species of photographer, who flies inconstantly from one process to another, dabbling in each and excelling in none. A certain amount of steadiness and method is an indispensable qualification before any creditable work in photography can be done. But there is a vast difference between the good qualities before-mentioned and that hopeless inertia which seems to seize upon some people and chain them to an unprogressive and stationary existence. The tide of improvement rolls by and leaves them just where they were before; no new process can tempt them with its alluring promises. Nothing can stir them from the complacent and settled conviction that whatever once represented the high-level mark of photographic work, must still remain unchallenged at the top, let time bring what it may. This sluggishness of temperament is, after all, a decidedly Saxon characteristic, at once our weakness and our strength; shown at its best in the obstinacy and tenacity with which our tiny garrisons in distant lands can hold their own, and win, when all seems lost; and at its worst in the careless indifference displayed as industry after industry goes abroad, for lack of the enterprise and initiative to cope with foreign competition. The lesson taught by reflection seems fairly obvious. Let us get just sufficiently into a groove to travel steadily and evenly along the path we have marked out; let it be a well-planned groove, leading definitely to its object, yet not unattractively straight and inelastic; let us have an abundance of sidings, into which we can shunt our trains of work and thought when rest and recreation seem desirable; and, above all, if the track prove badly laid, or leading us astray from our artistic goal, let us hesitate not a moment to pull up the rails, and start our line afresh.

THE VALUE OF FRATERNITY.

Just at the present time the profession needs no argument advanc to convince it of the advisability of a larger measure of open int course. The strong attack which has just been made on it by ou side advertising enterprise has awakened it, as it has never befo been awakened, to the need of a strong, united front. It is, perha almost to be hoped that the victory that is now being striven for w not be too easily gained, for the harder won the fight, the more w it weld photographers together. One of the proposals in regard the Professional Photographers' Association is that it will include number of separate and local lodges or chapels. These will, p sumably, hold their own little local meetings and discuss things interest to the craft. In this meeting and interchange of opinion in my humble opinion, one of the most hopeful auguries for t future.

It is curious how thoroughly fraternity has become almost an u conscious religion with the American photographer. And it almost pathetic to think of those who preached to deaf ears throu many weary, exciting years. A few earnest men were busy, for years ago, fighting the claims of the "process-monger." This spec species of fraud was in the early days of photography more rampa in America than in England. Ingenious rascals would sell worki rights for processes which were not covered by any valid patent, b which were the common property of all. A few "stalwarts," fo most amongst whom were Dr. Wilson and Mr. Jex Bardwell—[that time] men [full of youth and enthusiasm—conducted cyclo campaigns against the fraudulent, and more than once smash claims which appeared likely to drain thousands of pounds from t profession; for the mongers were not easily intimidated, and t leaders of professional rights were more than once in danger common mundane arrest and trial for libel, or some other equa vague and unsatisfactory crime.

It was this wholesale attempted blackmail which was one of t causes that led the old Professional Association to success. As t strong stimulus failed, through the discomfiture of the mongers, did the profession grow careless and their association fall on e times. At length not only the association, but—what cut much m nearly—the individual photographer began to feel the ground gr insecure, and to save himself from disaster he again woke to t cause of his fellow-worker and himself.

Just two years ago there was a picture exhibited at the professio Convention in America, and it created a furore. Many photograph were showing choice examples of their work, and the creator of t special picture, with a fine sense of the fitness of things, hung o picture only, in the centre of his generous appropriation of spa The picture had thus the best possible chance of attracting notice, it was in itself a wonderfully beautiful piece of work. It was a p file head of a young girl in a style and costume very stron suggesting those steel engravings of our late Queen, published ab sixty years ago. Now a new and very effective system of lightin beautiful woman in low evening dress is naturally of great interest the profession, and there was much speculation as to this pictu The photographer was written to, asking if he would describe l method for the benefit of the fraternity. He at once responded publishing full particulars in the leading professional magazine America, and after fully describing his procedure, he concluded, "T style has brought me much new business. Try it." He evidently c not fear "the other man," and as a result many wide-awake men ha displayed a new and very attractive style in their show-cases.

The various conventions held in America are worthy of a spec article. An interesting move has just been inaugurated by t professional photographers in Indiana. It is rather an exclusi affair this "Photographic Art League," being confined to twen members, and strictly to professional workers. One original a commendable feature is that twenty towns must be represente This precludes any possibility of the largest city—which has, believe, several able men in it—dominating the smaller ones. T twentieth man will come from some pretty small town. T obligations are slight but real. Twice a year the photographers w dine together; and each member is pledged to bring or send at le

ee examples of his work to each meeting. Papers may be read, pictures will be discussed and criticised, and good-fellowship will, is hoped, be cultivated. This semi-annual meeting will cause eteen of the photographers to travel, and some of them may have go more than two hundred miles. But they will meet their ther-workers, they will have a useful interchange of ideas, and they l have a "personally conducted" inspection of sixty photographs—duced within the last few months—by the most wide-awake and cessful of their neighbours. Concerted effort of this kind can ve but one trend, that of the widening and elevating of pro-sional photography.

The same idea, carried out on a much wider scope, has taken firm d in Boston. Boston, a city of over one million people, is a great ce; and like all the truly great is capable of harbouring a usion—for it considers itself the hub of the universe. However t may be, Boston, which seldom advertises its photographic stence in national circles, has good professional photographers—one but many—men who understand art as well as photography, l who know, too, the art of success from a business standpoint.

Just six months ago, a few Bostonians organized a club which y termed the "Lens and Brush Club." With a delightful touch American freedom and capacity for getting at the main point, this b has either not burdened itself with a string of rules, listed under man numerals, or it has forgotten to make such list accessible to public or its members.

Nine persons were in at the birth, and they included some of the st advanced and artistic workers in New England, as Captain hn Smith named that part of the country which is now divided o half-a-dozen States around Boston. Mr. W. H. Partridge was sen first President, about which more anon. When the Club was en weeks old it had a membership of fifty—"photographers, ists, critics, and lovers of the beautiful"—a membership gathered m the best men of New England. When the inevitable dinner s held, forty-five of the fifty members were present—signs of a lthy virility—and they entertained almost as many guests. In bruary of this year they held an annual meeting, fixed a limit of mbership at two hundred, and have now reached that limit. The b has some original ideas: one is worth quoting, for it holds that cial attention should be given to photographic technique and the velopment of a thorough understanding of pictures before any empt at production is made by the members. It is a pity that so dable a rule has not a wider application. The meetings of the b are devoted to an hour's talk on practical photography and to ticising pictures produced by the members, and pictures criticised reproduced under the added suggestions of the critics and again ought forward—a novel feature which is at once helpful and ctical. The Club won't have anything to do with prizes or dals, considering that its members can receive sufficient honour in approval of their fellows. The Club is at present arranging permanent quarters, where doubtless the inevitable salon will be d, and where many educational features will be available. Although so eminently professional in its aims and actions, and in its ception entirely composed of professionals, it now includes in its nks many leading amateurs.

I referred to Mr. W. H. Partridge. Now, Mr. Partridge is a bad n—a very bad man—for, although undoubtedly an able and rtistic" photographer, he actually is not ashamed to make pictures hich *sell*. He does quite a publishing business in those absurd tle pictures of juvenile impossibilities which so delight the hearts many womenfolk. He will dress a child in a most incongruous mbination of wooden spade, and bucket, and garland of fig-leaves; the juvenile, divested of this accessory, will sprawl in fat creases a continuous background of sea-shore, stretching away to a high rizon of storm-tipped waves. And yet, in spite of this sad bowing wn to Mammon, his fellow-workers decided that he was a man to nour. However, I suppose that even an artistic photographer may allowed to be a sensible man.

These are two specific examples—many might be quoted; for in ys innumerable the American photographer rubs shoulders with his llow, or finds out what he is doing. There is a very effective cessory, used on this side by William Gill; probably by others. It is the idea of using a window at which the "sitter" stands as though looking out, and, if cleverly handled, is most effective. The same thing has been done in America by H. H. Pierce, one of the best-known workers of the new school. In several way this special idea has by Pierce been made known to others in the fraternity. He has, I believe, shown it at various professional exhibitions; when he calls on his fellow, it doubtless is included in the portfolio or parcel which he carries; and he has allowed it to be reproduced in the illustrated magazines. As a result of this publicity the idea is being used in other studios where wide-awake men are on the look-out for some new thing with which to enrich their show-cases.

The man who is wide awake and progressive is the friend, not the enemy, of his brother professional. There seems to be an old-fogey notion that the "patronage" accorded to the photographer is something like a cake, where if one gets a bite too much another gets a bite too little. The hard fact is that the progressive man creates *new* business. Photography is the better, and not the worse, because Barnett has opened in London, or because Hollyer devotes a part of his time to portraiture. The man who fraternises and learns will not only help his fellow; he will also help himself to the practical advantage of more work and better prices.

WILLIAM EDWARD WARD.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

XI.—NEUHAUSS, 1898 (CONTINUED).

IT was now necessary to find the most favourable conditions of illumination for the resolution. The smallest stripe-distance resolvable for central illumination by a definite objective is the quotient of the wave-length by the N.A.; for the most oblique illumination possible, on the contrary, the quotient of half the wave-length by the aperture. Thus oblique illumination is the most favourable. Thus for a distance of laminæ of 0·00038 mm., obliquest illumination, and in white daylight (λ=0·00055 mm.), the objective must have a N.A. of 0·72—possible with a good dry system.

However, it was found in practice that nothing could be attained with obliquest illumination. Since the thinnest paraffin sections had yet a thickness of 0·002 mm., only a confused pell-mell (Durcheinander) and indistinct outlines of silver grains could be seen. Also in this case diffraction fringes, which can hide every kind of striping, are unavoidable. They can only be wholly avoided (which is to be striven for in all circumstances) by central illumination with as broad a cone of light as possible. This requires an objective system with 1·45 N.A. Zeiss' monobromnaphthalin-immersion objectives (1·60 N.A.) are out of the question here, for the imbedding medium must have an index of at least 1·60, and that of albumen is hardly 1·50. The oil-immersion apochromats are only of N.A. 1·40. But if *blue* light (λ=0·00045 mm.) is used, the resolution is already attained with a N.A. of 1·18.

Thus Neuhauss used sunlight after passing through a dark-blue copper-oxydammoniac solution, and could then see the thin Zenker's laminæ with central incidence. Still more perceptible (auschaulicher) were they on photo-micrographs with a linear magnification of 4000. The yellow-brown preparation, which absorbs much of the blue light, is too dark for the eyes; yet in specially favourable places the striation could be seen.

The distances of the stripes measured on the negative exactly coincided with the calculated distances. Therewith was the proof given that Zenker's theory, with respect to the arising of colours in photochromes, is correct.[1]

Some trials showed that also with light of greater wave-length than 0·00045 mm., in spite of central incidence, the resolution of the stripe system can be brought about. Here, however, the incompletenesses of the hitherto used oil-immersion became very marked; for, when the light-cone was sufficiently broad, the image always

[1] That, according to Wiener's researches (*Wied. Ann.*, lv., 1895, 225), the arising of the colours rests *among other things* on body-colours is a matter to itself.

became indistinct. The possibility of working with the broadest cones is dependent on the best possible spherical and chromatic correction of the objective. The firm of Zeiss placed an apochromat of 1·40 mm. aperture at Neuhauss' disposal, and with this the stripe-system could be resolved with central incidence with white and yellow light, also when, as with the preparations imbedded in Canada balsam, the stripe-distance lay between 0·00022 and 0·00025 mm.

Without questioning the correctness of the formula $e=\lambda/a$, a satisfactory explanation can be given: with the Zeiss objective Neuhauss was in the position to use the aperture 1·30 fully.[2]

First, with a still broader cone would the image become indistinct. But with such a great breadth of cone very oblique bundles of rays act simultaneously with the central ones, and the former exercise their action according to the formulæ $e=\lambda/2a$.

With such a broad cone the Zeiss objective would also have failed if another circumstance did not come to our help. With *Amphipleura pellucida*, not only no cross-striping, but also only little of the *Kieselschale* can be seen. The *structure-image* is not compatible with such a broad cone. Quite otherwise is it with images resting on absorption. The finest *geisseln* of coloured bacteria appear best with the full aperture (1·40) of the system. With our sections we have in the yellow-brown silver deposit a thing half-way between absorption and structure-image. On account of the difference in index of the silver and the imbedding albumen, the absorption image does not come completely to validity. On these grounds the preparations are not compatible with so broad a cone as coloured bacteria, but a far broader one that *Amphipleura* is.

In the light of this knowledge, Neuhauss made a considerable number of exposures with the Zeiss objective—sun, lime, and Auer light, and yellow to yellow-green filters, which all clearly showed the laminal formation. It need not specially be emphasised that, with so broad a cone, confusion with diffraction-fringes is excluded. Always with a definite breadth of cone (varying between 1·0 and 1·3 N.A.) the resolution is most complete. With further increase the image weakens; with decrease a moment soon comes when every striation vanishes. With further decrease, striation again appears, but it is due to diffraction-fringes, which betray themselves by the manner of their course (Verlauf), and by their appearance also *outside* the section.

Only that half of the film nearest the mercury shows silver deposit, and the deposit becomes gradually fainter towards the middle of the film. It is remarkable that isolated grains existed where the film lay on the cellodium substratum. Here was a weak reflexion which, however, could only vary a few grains. In all six to eight laminæ were visible.[3]

The photo-micrographs also show why the colours are far less brilliant from the glass side; here those parts of the deposit turned to the eye with which the lamina-formation, in consequence of the already greatly weakened action of the light, is no more correctly done.

The laminæ show a wavy course, for the upper surface of the film is wrinkled because of the grain and the shrinking caused by the drying up; and the mercury adapts itself to the film.

It is in the highest degree desirable to continue these investigations and to extend them to mixed colours (to give a secure decision on the arrangement of the laminæ in this case). Such investigations would also surely enlighten us as to the unsuccessfulness of Lippmann's method with mixed colours.

It would also be important to establish how the laminæ-formation is fashioned with physically developed plates, which also show colours, even if false ones. For here the silver is deposited by the developer.

I have gone into Neuhauss' work in some detail for two reasons. Firstly, a full account of the previous work is necessary to any one who may endeavour to carry on this research—which it is important to do; secondly, this paper shows in a high degree those qualities wh are, I am convinced, necessary for *all* science, but which are yet to be found in memoirs bearing on *natural* (purely experimen science.[4] In such a full description of a research we are enabled see clearly every step, *why* it was taken, *why*, perhaps, rejec and *how* the results were attained. Here we have all the attract ness preserved, and, above all, the possible openings for critic best shown. But in the matter of mathematics or mathemat physics, *thought*-experiments—all this is changed without any v reason. The march of criticism is hampered by the form, in wh timidity almost becomes dishonesty; and all the attractiveness stifled by the exigences of "exposition." To read such a thing is a heartening task. All science will, by its wider appeal, progress m quickly when it avoids "exposition."

63, *Chesterton-road, Cambridge.* PHILIP E. B. JOURDAI

[2] Of course the front lens of the condenser and the under-side of the object carrier were connected by oil.

[3] The figure (*op. cit.*, 165) only gives a faulty idea. A print from the original negative was published in Neuhauss' book, *Die Farbenphotographie nach Lippmanns Verfahren* (W. Knapp, Halle a.S., 1898), 72 pp. (short notice in *Beibl.*, xxii., 844).

[4] *cf.* THE BRITISH JOURNAL OF PHOTOGRAPHY, September 28, 1900, 6 613. Such considerations are closely allied to the methods (naive imag followed (*e.g.*, by Faraday) in scientific research, which I have alluded before.

FOREIGN NEWS AND NOTES.

Perfumed Calcium Carbide.—In the *Photographis Chronik* we see a communication from Dordrecht, near Rotterd that thyme oil is being employed to prevent the unpleasant sm attending the use of calcium carbide in the manufacture of acetyl gas. Another advantage in the use of thyme oil is the slo evolution of the gas and consequent economy in use. Perfu carbide is likewise far less hygroscopic and will keep a much lon time.

Greasy Charcoal.—The *Allgemeine Anzeige für Druck* states that a new method of preparing charcoal for drawing upon sto zinc, aluminium, &c., has been introduced by the Gesellschaft graphische Industrie. This consists in soaking the charcoal in po oil for two or three days and allowing it to dry. Charcoal th prepared has earned a good reputation in Vienna and it is said th it may be used with chalk and Indian ink. For lithographers should be a great boon.

An Improved Tripod Head.—The *Central Zeitung Optik und Mechanik* gives particulars of an improvement in t direction for which protection has been granted in Germany. T plate forming the top of the tripod head is provided with a slot the centre. At one end of the slot, projecting above the plate, i stud resembling half the head of an ordinary screw. At the ot end of the slot is a similar stud, which is movable by pressure u a knob at the side of the tripod head, causing a small rod under t plate to carry the second stud close up to the first. The camera placed upon the tripod head, the studs pass through a metal ring the baseboard of the camera, and upon release of the knob a sp spring forces back the second stud against the ring, so that conical surface engages with that of the ring. The camera is t firmly fixed in position and may be turned in either direction.

Mistakes in Portraiture.—The photographer should very careful to avoid absurdities in the use of backgrounds accessories. Merits, which the picture may otherwise possess, l all their charm, and the eye inevitably rests upon discordant note the photograph. A striking example may be found in the A number of the *Atelier des Photographen*, which nevertheless gives readers each month excellent specimens of photographic work. page 57 we find a three-quarter-length photograph of a lady hold a violin. Either the lady was not a violinist, or the violin belon to the photographer, who had no idea how the instrument should used, for the bridge is close up to the finger-board, leaving no sp for the use of the bow. If this photograph was taken to order would be interesting to know if the lady accepted it.

Matt-surface Papers.—Some months ago we dr attention to the action being fought in Germany concerning the u of raw starch in the manufacture of matt-surface photographic pape G. J. Junk had obtained a patent which covered the use of starch

is purpose, and the Neue Photographische Gesellschaft and Kodak ontested its validity. Although starch had been used in this ountry many years before for such a purpose, the decision has gone a favour of the patentee. Kodak now advertises in the German apers, that the decision does not affect the manufacture of their romide papers, as the use of starch has been discontinued by them or a considerable time.

Cleaning Condensers.—An ingenious suggestion is made by eb. Schulze in the *Deutsche Photographen Zeitung*, relating to the se of condensers in the enlarging lantern, *àpropos* of the recent atent obtained by Emil Busch for an improvement in the mounting f condensers. Although the lenses may be clean, the use of the antern may be delayed for some time in consequence of the condensation of moisture upon the lenses, through the low temperature f the room. Herr Schulze suggests that the mount should be made vith apertures above and below for free passage of air between the enses. A spirit lamp with a very small flame placed underneath the ondenser would dispel the moisture almost immediately. Small lides might be provided to close the apertures in the mount of the ondenser.

The Archiv für Wissenschaftliche Photographie.—It is with much regret we notice that with the March number this photographic periodical closes its short but brilliant career. The editor, Dr. W. Eugen English, writes: "Only in the direction of the attainment of a position of respect in the literature of photography, from which various incentives to thought have proceeded, have our hopes been fulfilled. We have given every opinion the opportunity of publication, regardless of personal or party considerations, and our repertory has included every advance, within the domain of the *Archiv*, upon its own merits. We look with pleasure at the list of contributors to the *Archiv*, and with satisfaction to the fact that the periodical has had a friendly and cordial reception everywhere with but one exception, in which instance an attitude of opposition was assumed from the first. But we regret that what we have accomplished has not been attended with commercial success, and however much we may deplore that a purely scientific photographic periodical cannot be maintained in Germany, we cannot ask for further sacrifices from Herr Knapp, who so unselfishly called the paper into existence for the permanent advancement of photography."

PHOTOGRAPHIC PAPER.

Although such a large quantity of baryta-coated, or, as it is technically called in the trade, aristo paper, is used in England for P.O.P. and other purposes, little has been attempted by English paper manufacturers and enamellers to supply this want, for, although several English firms have had the subject under discussion, the matter does not seem to have made a lot of headway, whereas the high-handed action of Messrs. Blanchet Freres and Steinbach, in forcing up the price of their respective papers, gave English manufacturers a grand opening, rather more than two years ago, which unfortunately has not been taken any great advantage of. Undoubtedly the difficulties are great, and, as the writer pointed out in a previous article upon this subject, which appeared in The British Journal of Photography of January 6, 1899, many points have to be studied, for although some kinds of baryta-coated paper are obtainable, which are made in England, none of them are suitable for photographic purposes, by reason of the fact that neither paper nor coating is pure, which is an absolute necessity with paper that is to be used for P.O.P., as any impurities in either paper or coating will reduce the silver in the emulsion to the metallic state, or cause the paper to discolour when the emulsion is poured on; even with the German enamelled papers small particles of metal are found imbedded in the paper, and upon the application of the emulsion a black spot appears; this will probably occur with any paper, even where very great care is taken, as fine particles of dust and metal from the machinery may find their way into the enamel, and these are bound to cause trouble; one spot here and there is not of such very great importance, as it can usually be either cut out or printed into the shadow of the picture, but if (as often happens) a cluster of spots appear, that part of the paper is wasted.

Very little information is obtainable on the subject of enamelling paper with baryta, the only articles with which the writer is acquainted, dealing with the matter in any practical way, being in C. J. Leaper's "First Principles of Photography" and Wall's "Photographic Reference Book," and with these, of course, the information relates almost entirely to the preparation of the baryta enamel, and not in any way to the practical mechanical coating, which is almost of necessity a valuable trade secret, and as such, jealously guarded, and we must agree that it is rightly so, as often the experience has only been gained by the outlay of a great deal of time, money, and trouble; but, except in a few details, the process of enamelling and its machinery is not likely to differ largely from that of English enamelled papers, the main item being that it requires greater care.

The usual substance for the enamel is sulphate of baryta, and, as this cannot be obtained commercially in a sufficiently fine state of division to ensure the enamel being free from lumps, perfectly smooth and even, and practically without grain, an emulsion is formed by adding a solution of one of the salts of baryta to a sulphate of one of the other metals in a solution of gelatine, and by the process of double decomposition sulphate of baryta is formed, in a fine state of division, but a salt of the other metal is also formed, and, as this must be got rid of, the emulsion is allowed to set, and then squeezed through canvas into water, or the warm emulsion is poured into methylated alcohol (methylated with wood spirit, and not mineral, on account of the greasy nature of the latter, which would repel the sensitised emulsion), this being done to wash the unnecessary salt away, which otherwise might crystallise out on the paper, or, even if it did not do this, would probably spoil the sensitive emulsion with which the paper is finally coated. The enamel on the paper for gelatine emulsions may be prepared with a highly polished surface, as owing to the tenacity of gelatine, there is no likelihood of the sensitive film coming away from the paper, but for collodion emulsions the paper should not be too highly glazed, for collodion does not adhere so well to paper as gelatine does, and with a highly glazed paper the sensitised collodion coating peels off, a very common failing with collodion papers. Regarding this latter point, there is one item to which little attention has been paid by the German paper-enamellers, *i.e.*, that the enamel upon collodion paper has been made much too brittle, and consequently on the slightest bend of the paper the enamel cracks and peels off, bringing the sensitised coating away with it; on the other hand, gelatine being tougher and more tenacious, will hold the enamel together, even should the latter crack. Before enamelled paper is used for collodion emulsions, a sample piece should be taken and folded back, when sometimes the enamel can be distinctly seen and heard to crack and peel off. This class of paper is absolutely useless for collodion work, as the slightest rough usage in the washing operations will bring the film away. This kind of paper looks well when coated with the sensitive emulsion, as it is usually well-glazed, and, by reason of being hard and non-absorbent, the emulsion does not sink into the enamel, which is necessary to a certain extent with collodion emulsions, as otherwise they are liable to peel, a defect which has created a great deal of prejudice against collodion papers, and which is very largely attributable to the unreliability of the baryta substratum, for no matter how good the collodion may be, it is useless if applied to a paper where the baryta enamel peels off before the sensitive emulsion is put on. That collodion paper can be made which will not peel or crack the writer is quite convinced, as he has made paper of this class where no amount of purposely applied rough usage would remove the sensitive film; but, although a great deal depends upon the collodion, a great deal also depends upon the baryta enamel. The writer has generally found the paper enamelled by Messrs. Steinbach to be most suitable for collodion emulsions, although, like that of the other makers, it varies greatly. Until the baryta paper can be relied upon for uniformity, success with collodion paper will be greatly a matter of chance, and it is always advisable to coat a small piece of paper with collodion, and see how it behaves, before any great quantity is coated, when, if it is found to peel, it should be rejected, and either be returned to the manufacturers or be used for gelatine emulsions, for which it answers fairly well, although not quite so well as the proper gelatine paper; on the other hand, gelatine paper must not be used for collodion emulsions, as it is bound to crack.

There is a good field here for English paper-enamellers, with a certain market, which is likely to increase rather than decrease, and as Germany has become a keen competitor in many of our other trades, this is a very good opportunity to retaliate.

Matters like these are of especial interest at the present time, when, it is feared in many quarters, and many usually well-informed quarters too, that England is losing her trade, and pessimists are predicting her speedy downfall; but even at the flood-tide of prosperity it is suicidal policy to send money out of the country which, with a little trouble and outlay, might just as well be kept in, for every unnecessary penny spent abroad is a distinct loss to the country. German traders have the credit of being very obliging to their customers, and this may be true where they have to meet a keen competition, but where they have a monopoly, as with the baryta paper, they can be as independent and disobliging as any other nation, a drawback which any one having the misfortune to deal with them knows to his cost.

In the former article the writer mentioned the use of hardened paper-pulp rollers for rolling or calendering the baryta paper after it is enamelled; possibly it may be thought that wooden rollers would be preferable, as it is not safe to use metal ones. Certainly wooden rollers might be used, but they are not so reliable, for wood is very sensitive to atmospheric changes, alternate spells of wet and dry

weather warping them and sending them out of truth, even where a core of iron or steel is inserted to stiffen them, and also act as bearings, and when this warping occurs uniformity of surface upon the paper cannot be expected, as the rollers will be alternately pressing with the middle and ends, instead of evenly along their full length.

C. T. SUTTON.

EXHIBITION OF THE WORKS OF ROBERT DEMACHY.

THE eighth House Exhibition of the Royal Photographic Society, held at the Society's House, 66, Russell-square, W.C., is devoted to the work of Monsieur Robert Demachy, of Paris.

In inviting Monsieur Demachy to decorate the walls, the Royal Photographic Society has given evidence of that spirit of catholicity which should be, and we believe is, its guiding spirit. In accepting the honour that the Society has offered him, and in giving us the opportunity of viewing a collection of his work that has not been previously shown in this country, the distinguished French artist leaves us deeply in his debt. To say that the sixty-seven pictures which constitute the collection make the most interesting exhibition of pictorial photographs that we have viewed would hardly be too extravagant a statement, and we doubt if any one, whatever his predilections or prejudices, could leave the gallery with any feeling but of admiration, and one feels at once that the work is essentially French generally in subject and always in treatment. It is distinctly more reminiscent of the Paris Salon than the London Academy. The subjects are well varied. Monsieur Demachy is certainly versatile, and whether he is treating portraits, landscapes, or figures he seems equally successful. The figure studies seem perhaps the most characteristic, but that is because he attempts subjects that we are quite unaccustomed to in photography. Six pictures in a series entitled "Studies from Behind the Scenes," representing ladies of the ballet, are examples. These are wonderful. The graceful arrangement of the figures, the marvellous rendering of the diaphanous draperies, the management of the accessories, and the skilful disposition of lights and shades, combine to make pictures of subjects which, with the brutal fidelity of the lens, are apt to become vulgar and suggestive. These studies are typical examples of the refinement which is characteristic of all Monsieur Demachy's work.

Nude or semi-nude figures in photography are, as a rule, repulsive rather than attractive. We are nearly always conscious that we are looking at specimens of unidealised anatomy. Here, we are conscious only of beauty of form and subtle gradations of tone. In "A Bacchante" we have perhaps as near an approach to a purely imaginative work as photography can give us, an extremely beautiful figure, and handled with such art that it is difficult to realise that it is otherwise than entirely a creation of the fancy. But though this is as striking an example as any of the faculty Monsieur Demachy has of idealising his subjects, there are many others that will equally repay study. The landscape work, of which a fair proportion of the exhibition consists, is almost as individualistic in treatment, though here and there during the past winter we have met with work where the same medium—gum-bichromate—has been employed, in which similar effects had been attempted, and not without success.

In the short address, written by Monsieur Demachy, and read on the opening night by Mr. R. Craigie, Monsieur Demachy referred briefly to what he suggests is the popular sentiment with regard to those enthusiasts who spent their leisure in the production of pictorial photographs. He may rest assured that if any apologia were needed his work provides it more effectually than any words could do. He explains that all the work exhibited is printed either in gum-bichromate or ozotype manipulated similarly to gum-bichromate, and states that he is neither a draughtsman nor a painter. That this is so must surely be due to want of inclination rather than to want of ability. The most characteristic feature of the gum-bichromate process, as a process, is that the results are not necessarily a translation of the degrees of opacity of the negative from which the print was made, but by manipulation during development may be so modified as to be almost unrecognisable as the production of the original negative. That Monsieur Demachy has availed himself of this power of modification to the fullest extent is unquestionable. Mr. Craigie, in his remarks, said he had seen prints from many of the negatives in gelatino-chloride and other processes, and the difference between the mechanically finished print and the gum print, as developed by Monsieur Demachy, was so astonishing that it was difficult to realise that they were produced from the same negative. Photography has been reproached with being simply mechanical, but prints such as those exhibited, in which the skeleton only is photographic, and in which the most admirable qualities are those which are due to the artistic conception of the author's brain, materialised, if not by the skill of a painter, by skill similar to that of the painter, are clearly in no sense mechanical. Monsieur Demachy has made no secret of his method of working. It is a composite method in which photography takes a part, and is perfectly legitimate, but it should not be called photography. The gum-bichromate process has a great future. This exhibition may do much to popularise it, and induce experiment, for as a process it is capable of improvement. At the least it will demonstrate that there has been some reason for condemning the granular specimens of the technique we have been told to admire.

The exhibition will remain open until the end of May. No one who has an opportunity of viewing it should miss it. The results which Monsieur Demachy obtains are often such as are unattainable by pure photography, but they are nevertheless worthy of study and of admiration.

GLASGOW AND THE INTERNATIONAL EXHIBITION.

I.

To photographers throughout the length and breadth of the land, the International Exhibition to be opened in Glasgow on the 2nd of May by the Duke and Duchess of Fife will prove a matter of more than common interest, for there can be no doubt that vast crowds of amateur and professional workers will be attracted to bonnie Scotland during the six months the Exhibition will be running. It was just thirteen years ago that Glasgow held its first venture in the matter of an international exhibition, and the splendid success, financially and otherwise, that attended the undertaking prompted a large coterie of Glasgow's town councillors and city magnates to repeat the experiment. The result is now seen in the really magnificent structures at Kelvingrove. In extent the buildings cover an area nearly twice as great as that of 1888, and the lavish expenditure that has been bestowed upon a thousand and one items of interest shows the determination of the Corporation of Glasgow to carry the venture through to a brilliant end. Erected on a site that is quite unique in its way, and without a rival so far as situation is concerned perhaps in the world, it is no wonder that when the prospectus of the Exhibition was issued the demand for space was so great that it would have required ten times the amount of ground to have accommodated those making application for room. From all parts of the world there came pouring in the most pressing demand for space, and the Executive have done their best by increasing as far as lay in their power the field at their disposal to meet this enormous demand. Doubtless much of this demand sprang from the fact that following so closely upon the Exposition held in Paris last year, many of the exhibitors there were anxious to follow on to Glasgow. The fact remains that the room at the disposal of the Executive was applied for ten times over, and hardly a novelty in existence will be noticeably absent from the show.

A very striking feature of the Exhibition is the Fine Art Section, linked with which will be found the Photographic Section, which must prove of the utmost interest to all who dabble in photography, for here will be found examples from all part of the world, of which we hope to speak more in detail after the opening ceremony. The portion of the building in which the Fine Art Section is contained has been built as a permanent structure, and has been erected at an enormous cost, and will remain one of the striking objects of interest in Glasgow for many years to come.

Those who visited Glasgow in 1888 will no doubt have a pleasant remembrance of much that was interesting in Glasgow apart from the Exhibition itself. During the years that have elapsed since then Glasgow has made some extraordinary advances, and it is not saying too much to state that at the present moment it is perhaps quite the most up-to-date city in the world, and those visiting the Exhibition during the coming season will have much to admire in the magnificent new structures, as well as the novelties in locomotion by electricity and otherwise. The subway itself is a sight which must possess the utmost interest to those who have never experienced the comfort and novelty of travelling under the city by means of an endless rope at the speed of about fifteen miles an hour.

To amateur photographers Scotland offers at all times much inducement as a field to tour over, and it goes without saying that the vast crowds which will this year take advantage of killing two birds with one stone, viz., seeing the Exhibition and then visiting some of the delightful glens and mountain districts of Scotland, will find the railway and steamboat companies not behind the times in catering for their comfort.

In 1888 the hand camera was practically an unknown factor, and at that time, so far as we can recollect, there was only one solitary example of its utility in evidence at the Exhibition at Kelvingrove, when Mr. James M'Ghie made bold to claim for a little quarter-plate Shew Camera a great future in the hands of amateur photographers. Many clever workers of the time ridiculed the idea of taking even small-sized pictures without a rigid support, but Mr. M'Ghie, with the usual Scotch doggedness, went about the Exhibition grounds securing delightful little pictures that soon caused surprise to those who had so recently cavilled at his efforts. What a mighty change since then! and who can venture to compute the number of hand cameras that will be in evidence during the run of the Exhibition just opening? Whilst on this point it may be of interest to note that the Executive have arranged for no restrictions being imposed on those using hand

neras in the grounds of the Exhibition during its run. This is a y satisfactory decision, for all tourists; had even a merely nominal rge been imposed, it would have been difficult in many ways to ve levied the toll, or to ascertain who had and who had not paid for privilege.

Apart from the collection of photographs gathered together under wing of the Fine Art Section, there will be a vast collection of nmercial work, exhibited by different trading firms and corporate lies, that must prove of quite as much, if indeed not greater, interest n the more particularly pictorial collection of the Fine Art Section. ny of these commercial productions have been produced at great pense, and they cannot fail to prove highly instructive to profes- nal workers. In the educational section alone there will be shown a iking series of photographs showing the progress of public instruc- n in schools as practised at the present day, including tuition in pentry, swimming and diving, laundry work, physical drill, art sses, and modelling, &c., &c., that have been specially produced for s function. Truly not the least interesting photographic items will seen scattered throughout the entire Exhibition, and quite apart from Fine Art Section.

The original intention was that the Exhibition was to have been ened by the King and Queen in person on the 7th of May, but owing the death of Queen Victoria King Edward had to depute the duty his daughter, the Duchess of Fife, and this alteration necessitated changing of the date of opening to the 2nd of May. Notwithstand- which it is the proud boast of the Executive that everything s ready previous to that date, even to the driving in of the last ll. It is to be regretted that owing to an outbreak of smallpox in eastern portion of the city many of the Continental and provincial wspapers have given undue prominence to the matter. The fact is t Glasgow at the present moment is probably one of the healthiest es in the kingdom, and no one need be scared or frightened from iting the Exhibition on that account. If smallpox really exists the es are probably fewer than what is occurring in other large towns y by day. The difference is this, that every case in Glasgow is notified ly in the public press; in other places such does not occur, and it gratifying to note that the disease is practically stamped out by the rgetic action of the magistrates.

Precisely one week prior to the official date of opening of the Ex- ition, the Executive was enabled to invite representatives from all leading newspapers and journals of the world to inspect what has n a most prodigious undertaking during the past three years. Up- rds of two hundred pressmen and journalists (many coming all the y from America) responded to the invitation, and Thursday, April saw this unique gathering congregated under the grand dome the Exhibition to pass their comments on a work of great magni- e. The Lord Provost and other leading members of the Executive lcomed the visitors, and without delay proceeded to escort the hering to the chief points of interest in the Exhibition. One of earliest centres of attraction visited was the fine new art galleries. ese undoubtedly form the chief feature of the undertaking. From e to time the public in the West of Scotland had learned something this structure from those engaged in its construction, but up till ursday, April 25, its precincts had been carefully guarded from idle itors, no one but those absolutely engaged in the work of gathering ether the priceless gems it now contains being permitted to cross portals. The company were quite prepared to witness something eedingly fine, but on entering and crossing the vestibule visitors re face to face with what can only be termed "a superbly magnificent ace of art," which, without doubt, has no rival in the United gdom, and it will be strange indeed if visitors to Glasgow during run of the Exhibition do not carry away with them deep impres- ns of this altogether unique portion of the Exhibition.

Linked with the Fine Art Section in one of the side saloons on the lement flat just off the Grand Hall will be found the Photographic tion, embracing very nearly five hundred frames of photographs. re the press representatives were met by the Convener of the otographic Section (Mr. J. Craig Annan), who in a few words cribed the more important features of his collection, and claiming t such was undoubtedly the finest collection of photographs ever ught together. By dint of forethought and good management, Mr. nan was enabled to provide those gentlemen more particularly con- ted with the photographic press, and who were specially interested his section, with advance copies of the fine art catalogue, a brief nce at which shows at once how truly international the collec- n is, comprising as it does examples by the best-known workers in erica, France, Germany, Switzerland, Holland, Belgium, Spain, l the colonies. We may note that each country has developed most distinct and individual school of its own. For instance, the nch may be termed beautiful and chic, the German massive and ong, the American intellectual and poetic, whilst our own school y be characterised as strong in landscape. In gathering together s unique exhibit the Photographic Executive have very wisely, we nk, had in view the idea that an interesting feature would be a lection which would more or less show a certain progress in photo- phy over the last half century, and to a considerable extent this idea has been given effect to, for we find most excellent examples of photography executed as far back as 1844 by D. O. Hill, R.S.A., kindly lent by Andrew Elliott, Esq., and others, and then coming later down we see the class of work executed in 1857 by such workers as John F. White, LL.D. This historical feature of the Exhibition will naturally be reflected in the feeling those visitors will have when viewing many a familiar picture, such as the late H. P. Robinson's "Carolling" and Mr. D. R. Clark's "Trysting Tree," and it is like meeting old friends to see these exquisite pictures on the walls.

The hanging has been carefully considered and given effect to, and a word of commendation must be bestowed upon Mr. Annan and those gentlemen who have laboured with him for the clever manner in which the difficulty of coping with an undesirable sidelight has been effected. This has been done by forming a series of little chapels all around the saloon, by means of which a considerable amount of space has been utilised without blinding off any frame on the walls near the source of light. Scanning the catalogue, we find in the first chapel among the early numbers such names as Wm. Crooke, John Stuart, Charles Reid (of Wishaw), Robert Ayton, Viscount Maitland, Fred Hollyer, each of whom has contributed some of his best examples. Mr. Crooke has perhaps never been seen to greater advantage than in his "Infant Son of the Earl of Tankerville," the lighting of which has been superbly controlled. Mr. Charles Reid sends his celebrated "Willow Warblers." In the second recess or chapel examples by James Cox Cox, Shapoor N. Bhèdwar, J. Craig Annan, James Douglas, Henry W. Bennett, and the late H. P. Robinson will be found, all of which are worthy of the closest scrutiny. Mr. Annan's contribution is a portrait of Professor John Young, of very striking merit indeed, and Mr. Bennett's charming interiors cannot fail to attract and please those who take a special interest in this branch of work. It was, we understand, found impracticable to hang the exhibits of the different foreign exhibitors in classes by themselves, so the Hanging Committee have made no distinction in this respect, and American and Continental pictures are seen in many instances side by side. Of the former school, perhaps there are no more striking examples than those by Alfred Steiglitz, whose work bears the stamp of strong individuality. The number of foreign contributors is very great, and among the remaining chapels will be found most striking examples by such workers as Gertrude Kásebier, Maurice Bucquet, A. Mazourine, Roger Galichon, Albert Mortureux, Paul Corbin, Henri Vacossin, and Paul Naudot, &c., &c. Glasgow is well and strongly represented. W. M. Warnerke, Archibald Watson, J. C. Oliver, W. Ralston, all contribute their best work, whilst Mr. Craig Annan is a host in himself.

Our Editorial Table.

The Tella Hand-book of Photography.

Published by the Tella Camera Co. (W. E. Dunmore Proprietor), 110, Shaftesbury-avenue, W.C.

Of a convenient oblong shape, this catalogue, which numbers about 120 pages, is a fully illustrated synopsis of photographic apparatus, &c., in present day request by those—an ever-increasing number—whose leisure or occupation is devoted to camera work. Prominence is very properly given to the well-known Tella Hand Camera, and there are included half-a-dozen concise chapters on cameras, lenses, development, printing, &c., by a past master in photographic instruction—Mr. E. J. Wall, F.R.P.S. Thus the "Tella Hand-book," which is obtainable for threepence post paid, is of twofold value. A valuable feature of the Tella Company's business is that it is directed by a successful practical photographer in the person of Mr. W. E. Dunmore, whose advice and assistance should be all the more useful to his clients on that account.

A Gainsborough Photograph.

Published by C. Essenhigh Corke, F.R.P.S., The Studio, Sevenoaks, Kent.

The recent recovery of the long-lost "Duchess of Devonshire," by Thomas Gainsborough, has aroused widespread interest in the works of that master, and Mr. Corke has therefore acted with acumen and enterprise, we think, in giving the public an opportunity of obtaining photographic reproductions of one of the painter's most admirable productions. We allude to the "Miss Linley and her Brother," a famous work, now at Knole, Lord Sackville's seat, and valued at £25,000. Of this beautiful bit of portrait painting Mr. Corke has produced carbon prints in sepia, warm sepia and grey tones, and a specimen lies before us. It is an excellent reproduction, and we commend it to the notice of those desirous of enlarging their collection of photographs of notable pictures. If we mistake not, "Miss Linley and her Brother" is not very frequently photographed, and

consequently is not so familiar to the general public as many of the National Gallery pictures. Personally, we are pleased at possessing this reproduction, and advise those of our readers interested in Gainsborough's work to secure a copy from Mr. Corke.

The No. 2 Plico Kodak.

Manufactured and sold by Kodak, Ltd., 43, Clerkenwell-road, E.C.

The No. 2 Plico Kodak is issued in place of the No. 2 Falcon. Its distinguishing characteristic is the manner in which the camera is opened for the purpose of loading or unloading; the outer case being readily removed, so that both the receiving and unwinding spools are made easily accessible. The No. 2 Plico Kodak is for roll film pictures



$3\frac{1}{2}\times3\frac{1}{2}$; it measures $4\frac{3}{8}\times4\frac{1}{2}\times5\frac{3}{4}$ inches; the focal length of the lens is $4\frac{1}{2}$ inches, and the weight of the instrument $19\frac{1}{2}$ ounces. The usual ever-set rotary shutter, giving time and instantaneous exposures; set of three stops, finder and socket for tripod screw are fitted to the No. 2 Plico, which retails at one guinea.

Studio Gossip.

"A Happy Accident."—Thus the "Daily Express" of Saturday last: "M. Adolphe Gartner, an amateur photographer of Berne, has, it is alleged, discovered the secret of colour-photography. His process is very simple, and he has obtained some magnificent specimens of his work. He shows his photographs on paper, porcelain, and glass, the colours being blue, red, brown, and dark yellow. On glass the photographs are veritable pictures, perfectly true to nature in every detail. He has been working at his invention for several years, and by a happy accident discovered the secret, which consists chiefly in the bath, only a few days ago. The 'Buad' by far the most serious paper in German Switzerland, devotes a long article to the discovery, and prophesies a new era in photography. Many experts are interested in the discovery, and I hear that a famous firm of Paris photographers are sending down a representative to Berne to try and buy the secret from M. Gartner.'

Tuck's Heraldic Postcards.—Messrs. Raphael Tuck and Sons, of Moorfields, kindly send us samples of their latest publications in picture postcards of quite an original character; they are the first of the "Heraldic" series of cities and towns of the United Kingdom, issued partly with and partly without views of the respective towns, and the fact that in nearly all cases the originals of these city and borough arms were supplied to Messrs. Tuck by the respective Corporations, thus ensuring their perfect correctness, makes the issue of these cards doubly interesting to collectors. Up to the present they have in hand thirty different towns. In conjunction with all other postcards issued by Messrs. Tuck, these "Heraldic" cards are eligible for the firm's £1000 postcard collectors' prize competition, in which, in fact, they have a section entirely devoted to them.

A Photographer's Advertising.—One of the most useful citizens of any community is the up-to-date photographer. There are some local photographers who are so modest in regard to their art as not to realise this. You should bring to the mind of such a photographer the fact that this is pre-eminently an age of photography, and when he is wrought up to a becoming pride in his own business, you might spring upon him the equally true maxim that this is also pre-eminently an age of advertising. The photographer is a man with whom printers, publishers, engravers, &c., should be on friendly and reciprocal terms. He should advertise, and he should help others to advertise. There is need in the advertising field for the ingenious photographer, amateur or professional. The co-worker with the sun should earnestly study the possibilities of photography in advertising. Some of the most effective advertisements ever produced were made so by the use of good photographs. The possibilities opened up by modern engraving, in which the camera plays such a necessary part, are boundless. The field cleared by relief-work is, for instance, as yet hardly furrowed. The advertising and the photographic fields should be resolved into one vast common of interdependent influence. The ordinary photographer's business, with few exceptions, is a local one, and if he advertises in a paper of general circulation, he pays for bringing his advertisement before thousands of people whom he does not want to reach—who could not possibly have any interest in his photographs. The photographer, as well as other advertisers, should carefully study advertising from economic standpoint—should learn how to get the most returns fr his advertising with the expenditure of the least money. And tha just what the job printer, &c., should teach him how to do. Fo is better for a representative of an advertising trade to insure an ad tiser favourable returns from his advertising even if the profits are so large on the first order, than to induce him to have a big job poor advertising which will discourage him. The man who once ad tises with marked success is a believer in advertising who will d good deal more of it. But it is hard to get an advertiser whom may have induced to have spent money on advertising which did profit him, to advertise again through the medium of your w Have you ever done anything to increase your business? That is, h you ever made a real effort to get business which would otherwise to somebody else? Did you ever try to have a man get photograph himself—or his family—or his horse—" or anything else that is h —by reasoning with him? The man who wants photographs will them—but he who deems them a useless luxury needs to be educa Even the man who wants photographs may not get them from y Do you sometimes feel that you wish you had time enough and w in a position to talk to many persons concerning the subject of gett more pictures taken? Of course you realise that the idea is somew fanciful, but the thought must occur to every photographer.—"Mod Advertising."

News and Notes.

The International Fancy and Leather Goods Exhibition opens Princes Skating Club, Knightsbridge, London, S.W., on Saturd May 4.

Royal Photographic Society.—Ordinary Meeting, Tuesday, May at 66, Russell-square, at 8 p.m. Major-General J. Waterhouse, I.S. will read a paper entitled "Notes on the Early History of the Cam Obscura."

We have received a programme of a photographic excursion to Rhine Valley and Ahrgau, to be personally conducted by Mr. William Slater, F.R.P.S., from May 18 to May 27. Full particulars are obta able of Mr. Slater, at 5, Firs Parade, High-road, Lee, S.E.

The Cardiff and County Horticultural Society's Thirteenth Ann Show, to be held July 17 and 18, 1901, will include an art section a several classes for amateur photography as follows:—Class 1. For best photograph of plants, flowers, or shrubs, in pots or in the op First prize, £1 1s.; second prize, 10s. 6d. Class 2. For the best pho graph of arrangements of flowers or plants in vases, table decoratio button-holes, and cut flowers; merit, natural grace. First prize, 1s.; second prize, 10s. 6d. Class 3. For the best photograph of fr or vegetables, or fruit and vegetables. First prize, £1 1s.; sec prize, 10s. 6d. An entry fee of 1s. for each class will be charged, wh must be paid at time of entry. All communications relating to the co petition must be addressed to Dr. DeVere Hunt, Hon. Secretary, We bourne Crescent, Cardiff.

Photographic Enterprise.—Mr. Charles Sweet did a remarka smart piece of work in connexion with the launch of Shamrock II. addition to commissions from certain London papers, Mr. Sweet taken some snap-shots of Sir Thomas, with the latter's permission, it was important to have the prints despatched as soon as possi The same evening the full set of prints were exhibited, and on Sun he was rowed across to Wemyss Bay, whence he cycled to Green There he had the good fortune to meet Sir Thomas Lipton, Lord R bery, and Lord Breadalbane at Greenock Central Station. Sir Tho expressed his surprise and pleasure at Mr. Sweet's expedition, and L Breadalbane ordered a complete set of the views which he had tak Mr. Sweet continued his journey to Glasgow, and had his prints post in time to reach London early on Monday morning.—"Rothesay press," April 24, 1901.

Affiliation of Photographic Societies.—At the meeting of the Exe tive Committee held on Thursday, April 18, at 66, Russell-square, Robert Beckett (Hackney), in the chair, negotiations for three n lectures were opened. A lecture by Mr. Walter Kilbey on "High Spe Instantaneous Photography," with numerous lantern slide illustratio will be ready for circulation almost directly. The following gentlem were re-appointed the committee of judges to deal with small socie competitions:—John A. Hodges, F.R.P.S., A. Mackie, E. Marria F.R.P.S., J. C. S. Mummery, C. H. Oakden, F.R.P.S., W. Thom F.R.P.S. This committee is prepared to meet three or four times annum to adjudicate upon any competitions submitted by the affiliat societies. Mr. John F. East (Kingston) was elected a member of t executive committee, in place of Mr. H. Snowden Ward, resigned. Robert Beckett was appointed the chairman of the committee for t present year. The secretary was directed to approach various pub bodies with a view to their recognising the Photographic Red Book, as permit to its owner to photograph in places where, at present, spec permission has to be obtained. It is hoped that the move in t direction, commenced in the case of the Zoological Society of Londo who have agreed to the committee's suggestion, will meet with a wi measure of success.

Commercial & Legal Intelligence.

Messrs. Morley and Cooper, of 70. Upper-street, London, N., have issued a new catalogue of cameras, lenses, and accessories.

Mr. H. F. Purser, the representative agent, of 31, Hatton-garden, E.C., has issued a supplementary list of enlarging lenses and condensers, new aplanat sets, &c., manufactured by the Rathenower Optische Industrie-anstalt.

The Rotary Photographic Company, of 23, Moorfields, and West Drayton, are issuing two new show-cards, which are attractive in appearance and tasteful in design. They bear specimen prints of the company's various grades of bromide paper: and the qualities of those prints are excellent. These cards at once arrest attention, and must form capital ornaments for the counter or shop window of a photographic retailer.

The Whetstone Photographic Works, Limited.—This company has been registered with a capital of £2000 in £1 shares, the objects being to acquire the business now carried on by B. Acres, and to carry on the business of manufacturers of and dealers in photographic materials, accessories, and apparatus in all its branches. No initial public issue. The first directors, to number not less than two nor more than five, are to be appointed by the subscribers. Qualification £50. Remuneration as fixed by the company.

The London Stereoscopic and Photographic Company, Limited.—The sixteenth annual meeting of the shareholders of this company was held at the Regent-street premises of the company, on Friday last. Mr. Kenyard who presided, said that competition in their business was keener than ever, but they had a splendid connexion, and he was certain that no firm or company in London supplied better articles than they did. The effect of the war had been to take away a number of their customers, but he hoped they would return shortly, and that there would then be an increase in their business. Notwithstanding the depressing state of affairs during the past year, and he had much pleasure in moving the adoption of the reports and accounts. The motion was seconded and agreed to unanimously.

Re Robert Thomas Ford, photographer, King-street, Egremont.—The public examination of this debtor took place at the Birkenhead Bankruptcy Court, on Friday last, before Mr. Registrar Cave. The statement of affairs filed by the debtor disclosed liabilities amounting to £346, and assets nil. Replying to questions put by the official receiver, debtor stated that he was employed as a photographic operator in London down to 1892, when he went to Windermere to manage a business in the same line. In December, 1898, he commenced on his own account at Egremont, with a capital of about £400, most of which was his own savings. In February, last year, being in want of money to extend his business, he gave a bill of sale over the whole of his effects for £200. The holder of the bill took possession, and sold up the debtor in the following August. This resulted in litigation which went against the debtor. Since then the business has been carried on by his wife, with the assistance of her friends. He was managing it, and received his keep, and 10s. per week as pocket money, but had no other interest in it. He could not give a satisfactory explanation of the discrepancy between a statement in an account that had been prepared showing a profit in one year of over £450, and the statement in the deficiency account, that the profit for the same period was only £50. The business had fallen away considerably, when he began to get into difficulties. Eventually the examination was ordered to be adjourned.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
6	Camera Club	Ladies' Evening.
6	South Manchester	Demonstration: *The Wellington Film.* H. Wade, jun.
7	Gospel Oak	*Photographic Apparatus.* S. Muggeridge.
8	Ashton-under-Lyne	Meeting of Members, to compare results of Ramble to Chatsworth.
8	G.E.R. Mechanics Institution	Lantern Evening. J. K. Ayling.
8	Liverpool Amateur	Excursion: Moreton Old Hall. Leader, Mr. Welch.
8	Redhill and District	General Discussion on Apparatus.
9	Camera Club	Annual Dinner.
9	Hull	Cycle Excursion: Hornsea.
9	London and Provincial	Open Night.
10	West London	Discussion on Outdoor Work. Arrangement of Summer Programme.
11	Croydon Microscopical Society	Excursion: Rock Pit, Elmstead Lane, Chislehurst. Leader, Dr. Franklin Parsons or G. W. Moore.
11	Walthamstow Photo	Excursion: Hampton Court.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 25,—Mr. H. C. Rapson in the chair.

Mr. P. Everitt, replying to a member who asked for a statement of the conditions governing the alteration of the focus of a lens with the alteration of the stop, said that it was a question of uncorrected spherical aberration. The rays passing through the margins of the lens crossed at a point different to that at which rays passing through a more central zone crossed. With full aperture then the image would be sharp at a given distance, but if the lens were stopped down the sharpness would be found to occur at a different point, because the marginal rays were cut out. Years ago he said that he had one of Swift's long focus single lenses, which varied very considerably in focus with the diameter of the stop used on account of this uncorrected spherical aberration. He should not expect to find such a state of things in a lens of the character of the newer lenses now made.

Mr. W. McRae mentioned cases within his own experience where the use of a yellow screen upset the focus of the image so much that it had to be refocussed.

Mr. Everitt expected that the screen was not upon optically true glass. He recently came across an instance in which a lens of thirty inches focus was affected to the extent of an inch when a colour screen was introduced. He believed it was lengthened, but was not sure. The occurrence was entirely due to the colour screen which, if used between the combinations or close in front of or behind the lens, should certainly be optically worked and plane.

Mr. McRae had an idea of so altering his dark slides as to be able to use the screen immediately in front of the plate.

Mr. Everitt said that unless a screen were optically true as he had recommended, it was far better in the position just named by Mr. McRae.

A member said that he had been shown some cells for liquid filters, all the surfaces being optically worked. Such liquid filters were almost exclusively used on the Continent by "three-colour" houses.

Mr. Everitt said that a considerable number of these cells was made and very beautiful pieces of work they were. As regards the prices, which were mentioned as £15 each for a lens of two and a half inches diameter, he knew that for smaller lenses the price was about £5. The four surfaces of the cell were all actually true. As an illustration of the perfection of the work he said that when the glass forming one side of the cell was placed upon the glass ring which formed the separator, and the other glass upon the other side, and the three pressed together, they held themselves, and it was very difficult to get them apart. Only a skilled hand could separate them. A "flat" was the hardest thing to work; sometimes a man would be engaged for a month on one surface in the case of large flats.

The Chairman spoke of the colour filters in general use amongst American workers, namely, the Bausch and Lomb "ray filter," in which bichromate solution was employed.

Mr. Everitt promised to bring up a flat, and to test the surface of Mr. McRae's colour screen for flatness if he would bring it up. For ordinary landscape photography it was not important to have the highly finished screens, but in cases of line work where critical definition was essential, the accuracy of the surfaces of a screen was an important factor. The ordinary screen used in this country for three-colour work was bad. It was useless to have a perfect lens working at a large aperture if the badness of the colour screen necessitated excessive stopping down to give a passable result. This was done however. Continental workers, he knew, were aware of the importance of using perfect screens.

Mr. A. Haddon remarked that of all screens, he preferred stained collodion. Referring to a particular screen, of which he had given a sample to one of the members for trial, he said that it was made from an alcoholic extract of the dye used for the cover of the "Photographic News." The particular member said that it worked very well.

PHOTOGRAPHIC CLUB.

April 24,—Mr. J. W. Mason in the chair.

Further discussion took place respecting the method of blue printing with a glass cylinder instead of a heavy and cumbersome frame of the ordinary pattern. Mr. J. R. Gotz, who has an intimate acquaintance with this business, contrasted the old method with the new, to the advantage of the new. In discussing the printing of large sizes of paper in this way from maps and plans, an inquiry as to the size of the biggest prints and enlargements made by those present naturally arose. Mr. F. A. Bridge said that he had made a print seven feet by five feet, but as it was not essential that it should be in one piece and it was more convenient for him, it was done in sections. The biggest enlargement he had done was eighty by forty inches from a piece of a negative measuring one and a quarter inches. The recorder spoke of an enlargement measuring eight feet six inches by forty inches done in one piece in his presence. Mr. J. R. Gotz said that a direct print of sixty and forty-two inches were quite difficult enough—he had worked that size himself, but the cylinder referred to previously as coming into use amongst engineers' draughtsmen would make the task much easier.

A discussion also took place respecting the Chapman Jones plate tester, and its probable utility.

Croydon Camera Club.—The usual Wednesday lecture was held on the 24th ult., at the Art Gallery, when a full attendance of members and friends came to hear Mr. F. O. Bynoe. The President (Mr. Hector Maclean. F.R.P.S.), in introducing the lecturer, stated that he himself had been trying to accumulate a store of photographic facts for many years, but had found more fallacies than anything else. He also stated that the Club was constantly receiving applications for membership for ladies. As they were not able to elect the aforesaid, he suggested that some energetic lady amateur should organize a local

association, and promised that the Club would lend their rooms and otherwise aid such a Society. Mr. Bynoe, who is a member of the Croydon Camera Club, held his audience for nearly two hours while he unfolded his tale of facts, and explained a number of mysteries in a manner which was designed to be understandable to the great unlearned. The strong feature about the lecture was that some unusually ingenious mechanical slides had been prepared to illustrate points dwelt upon. Thus the undulatory theory of light transmission was graphically shown by means of a string of bright circlets which successively rose and fell. Similarly the mechanism for testing shutter speeds was clearly expounded to the eye. How the device is operated whereby the forty flat films of the Frena are changed was not the least ingenious of the series, and evidently was viewed with great interest. Perhaps the most valuable lesson imparted was by means of a slide, which showed how the negative attachment to an ordinary R.R. lens is capable of producing a tele-photo image, and how, as the attachment is brought closer to the ordinary lens, the tele-photo image becomes larger. We cannot chronicle a hundredth part of the matter of Mr. Bynoe's varied and valuable remarks, which were very much relieved and effectively illustrated by lantern diagrams and lantern slides displayed by the capable hands of Mr. A. E. Isaac. They were not only done full justice to, but were fully and heartily appreciated. Especially enjoyed were a series showing the blunders of beginners. Several of these called forth roars of laughter. In speaking about tele-photography, apropos the new Beck-Steinheil anastigmatic lens, Mr. Bynoe stated that he held in his hand the first copy just received straight from the press of Messrs. Beck's "Practical Notes on Tele-photography," which he had much pleasure in asking the President to accept. At the termination of a lecture which certainly had quite enough facts for one night, at the instance of the President, the audience awarded Mr. Bynoe an exceedingly cordial vote of thanks.

North Middlesex Photographic Society.—Ap. 29,—Technical Meeting.—Mr. Marchant read an article written in 1854 from a magazine of that date, entitled "Photography as a fine art." The views of the writer were very applicable to the present day, and the article was very interesting. Arising out of the article, the President gave a short history of how the Royal Photographic Society was inaugurated, and the part the Prince Consort took in persuading Fox-Talbot to let amateurs use the process without licence for himself.

Newcastle-on-Tyne and Northern Counties Photographic Association.—Mr. Walter Scutt gave a lecture on "Art Studies and Pictorial Photography." He began by showing lantern slides of some of the most famous pictures in the national galleries of Europe (including also the now famous one of the Duchess of Devonshire), to illustrate the part which form and composition play in the making of a picture, and also the limitations of photography, and to emphasise the latter point slides were shown of some water colours in the possession of the lecturer by well-known artists done by the usual processes, and then a slide from the same picture tinted most beautifully by Mr. Scutt himself, and beautiful as the form and lines were the colouring made them most entrancing. Mr. Scutt explained many of the rules of art, such as how a picture may be divided up into masses all of which are subordinate to the chief one, and then proceeded to show slides of very well-known pictures in which nearly all rules are broken with very happy results by artists who are masters of their craft, and as far as possible explained where the charm of these pictures lay. Slides were then shown of photographs by the author, Messrs. Sutcliff, E. G. Lee, and G. Hastings, illustrating the application to our art-science of the remarks he had made. In answer to a question by one of the audience Mr. Scutt explained that the rules of art are formulated from the study of the best pictures in the same way that the rules of grammar are deduced from the study of a language, and that the language is not made by the rules of its grammer.

Patent News.

THE following applications for Patents were made between April 15 and April 20, 1901:—

CAMERA STAND.—No. 7667. "A Cycle Handle Bar Attachment for Use as a a Camera Stand." JOHN ALFRED MCMICHAEL and JOHN ARTHUR HIRST.

CAMERAS.—No. 7897. "A New or Improved Method of and Means for Loading and Unloading Photographic Cameras with Plates or Films." DAVID ABRAHAM LOWTHIME.

PHOTO-ENGRAVING.—No. 7918. "Improvements in Screens or Gratings for the Half-tone Photo-mechanical Engraving Process." Complete specification. HENRY LYON.

SENSITIVE SURFACES.—No. 7969. "Improvements in Photographically Sensitive Surfaces." OSCAR GROS.

SHUTTERS.—No. 8170. "Improvements in Photographic Appliances for securing Views with Clouds and other High Light Effects at One Exposure." WILLIAM LIONEL GROVES.

CAMERAS.—No. 8082. "Improvements in Photographic Cameras and the like." EDWIN DREW BARTLETT.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No no is taken of communications unless the names and addresses of the writers given.*

*** *We do not undertake responsibility for the opinions expressed by correspondents.*

KODAK, LIMITED, AND THE TRADE.

To the EDITORS.

GENTLEMEN,—We shall be glad if you will grant us a portion your space to reply to what we must consider to be a misrepresen tion of the meaning and scope of our new conditions of sale, as affecti our dealer customers and the public.

Our policy has been, and is, intended to secure a fair and remune tive profit to the dealer who handles our goods, and, so far as t public is concerned, no fair-minded man can object to this.

The new condition is simply a continuance of that policy, for prices are to be protected the state of affairs involving cutting c ditions must be kept out.

It must be evident that if the dealers decide to encourage imitatio upon which there are no restrictions, we should not be in a conditi to continue the practice of maintaining the list price. There wou be no option but to open the way to the consumer to secure our goo at any price that the dealers might like to charge.

Take away the protective regulations now existing in the case Kodak goods, and an era of keen competition and consequent cutti of prices will at once set in.

This is not of so much importance to us. The lowering of the li prices in this way by competition would diminish the dealers' r muneration for selling, but it would probably increase the use of o products, and we ourselves and the big dealers can afford to rely the wholesale profit, or on a very narrow margin, because of t great extent of trade.

On our part, however, we are in favour of the existing policy, a we believe that any change in the direction indicated would be ve disadvantageous to the great bulk of our dealer customers. It is n difficult to see what would happen. The large stores would imm diately give away ten per cent. of their profit now secured to a dealers alike. They would be followed by the larger dealers, who, in number of instances, would go even further than the stores. T small dealer would have perforce to follow suit. Local competiti of the worst sort would be set up, and each dealer would be suspicio of the other. The upshot of this would be that all would suffer, mo particularly the small and medium dealers, whose turnover is compa tively restricted, and who would be liable to entire extinction. Ma of our dealer customers who are chemists are well aware that t profit on many lines of patent medicines is positively infinitesimal they are, in fact, not worth shoproom—owing to uncontrolled cuttir of prices on the part of the larger stores.

Our new conditions therefore make for the protection of the deal in a fair and remunerative profit, as well as for the sustaining of t high quality of apparatus and materials supplied to the consum The best guarantee of the continuance of such a state of things direct co-operation between our own organization and our dealer cu tomers. When the proper time comes, if it should be necessary, would take the opinion of our dealer customers upon these points. then they do not see their way to push our goods in preference imitations, it would be impossible for us to protect prices.

We have consistently and actively protected the trade, and so ha made good and stable business possible to all dealers, small as well large, and we expect in return from them this measure of protectio and reciprocation, namely, that those who sell our rollable film pr ducts and take our discounts will not sell any of these imitations imitations the whole of which seek to associate themselves with Kodak and to pick up some of the harvest due to us.

The assertion that we are seeking to control the whole photographi trade is not admissible for a moment. If any one will reflect upo the number of dealers who carry photographic goods as a side line chemists, ironmongers, stationers, &c.—it will be seen that if any thing of real value should come along it could not fail to be take up. Any great improvement would undoubtedly secure its prope place, and it would then be for those who control such an articl equally to secure their channels of supply, and say whether our good should be allowed to be sold together with their's or not.

Our condition of sale is not directed to shutting out other products Let every one make what goods he wishes, provided he is legally entitle to make them. All a maker has first to do is to learn to make goo goods. There is plenty of scope and room for anything of fine quality The field is open to him as it is to us.

Any dealer who wishes can take up and push anything he may prefe to our products. He is perfectly free to make his choice whether h will act as our agent or not. If, however, a dealer wishes to ru our rollable film manufactures, it has to be an exclusive agency so fa

they are concerned. In return for the protection we afford him, l the discounts we grant, we look for this.

t is a matter purely between ourselves and him to make a mutually neficial contract. The dealer is not in the least compelled to sell ything he objects to. He is free to decline the contract, and to ck his shop with all other goods of the same class, to the exclusion ours. This is the fact which puts out of court the allegation of so-called Free Camera Club, in asking the public to "join in a ional protest against coercion." It seems to us that the promoters this club put themselves in the very position they profess to attack, seeking to coerce and compel us to sell our goods and give our dis- nts to any dealer whether we object to him or not!

We have no right to deny our goods to any one who likes to pay our ail prices, but we do claim the elementary right to say whether not we shall supply our manufactures under discount to any par- ular dealer or dealers.

We would point out that the dealer who objects to our condition n nevertheless readily obtain our goods and can sell them alongside other imitations if he desires to do so. He can come and buy our ods in our own shops without any objection on our part, but if he es this, and will not accept our trade conditions, he cannot expect our scounts.

So far as the public are concerned, as we have said above, no fair- nded man can object to our protecting the dealer in a fair living ofit.

The interests of the public may seem to lie in an extension of price tting—and in this sense their interests are not those of the dealer. t price cutting usually leads in the long run to degradation of ality.

It is trivial nonsense to say that we mean to dictate to the public at they shall buy. This is an outrageous misrepresentation. The omoters of the Free Camera Club must know perfectly well that would be an utter impossibility for any firm to compel the public to y one brand only of certain goods (and bad goods, forsooth!). Good oducts will always come to the front.

Every individual is perfectly free to buy what cameras and films or she likes, and it is always open for manufacturers to appeal to e public direct.

Much ado has been made of the threatened "arrest of industrial ogress" in consequence of our action. To any one acquainted with e facts of the case it is perfectly well known—and indeed it is freely mitted—that the progress in this particular branch of photography due entirely to us. Most of the imitations to which we take excep- on are mere returns to methods and materials that we have discarded d superseded. Besides, England is not the only country in the orld, and does any one suppose that if an article of merit were pro- uced in—say, France, it would be unobtainable in England?

It must be remembered that but for the hundreds of thousands of ur Kodaks in use there would practically be no trade in rollable film all. We consider ourselves therefore perfectly justified in guard- g our business against the attempts of imitators to trade upon our eputation and prestige by associating their goods with the name odak and with other words associated specially with our apparatus..

A reference to your advertising columns will show, for instance, at one manufacturer in particular who makes cartridge spools for se in our Kodaks (and in our Kodaks alone) prints letters F.P.K., o. 2B (for Bull's-Eye), No. 4 Cartridge, on representations of spools their advertisements. Is this the style of freedom to be encouraged s English? This is only one of the number of attempts to associate nitation rollable film products with our own.

We have every confidence that the good sense of our dealer cus- omers will prevent them from being led away by the specious cries of terested individuals. What, may it be asked, have these individuals one for the dealer? And is their self-imposed mission to clear the orld of what they are pleased to call "injurious monopolies" prompted ntirely by philanthropy?

We think we may trust to the intelligence of our dealers to recognise he motives that undelie the action of these agitators, and to see that heir true interests are bound up with ours in the protection of prices— he question which is really involved in our new condition, and hich is the surest guarantee of the maintenance of a high standard f quality.—We are, yours, &c., KODAK, LIMITED.

April 29, 1901.

To the EDITORS.

GENTLEMEN,—I am requested by the members of the Woolwich Photographic Society, present at the last meeting, held on Thursday, 25th inst., to forward to you the following copy of a resolution passed by them, viz., "That this meeting protests against the action of the Kodak Company compelling dealers to sell films and roll carrier cameras only of their make, as unfair to other manufacturers, and detrimental to the progress of photography."—I am, yours, &c.,

161, Griffin-road, Plumstead, April 29, 1901. F. W. MACHEN.

SOAP AND TOBACCO PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—Messrs. Lever and Ogden are not being blessed just at present by the knights of the camera. Various remedies have been suggested for putting a stop to their unfair poaching in photographic preserves. The JOURNAL has analysed and summarised the essentials of the schemes. Some it has already shown to be impracticable, some approved of in a modified, and others in a less qualified, way. But throughout the whole there appears to be a reluctant, subconscious doubt as to whether any of the suggested remedies, however admirable in themselves, would act to the specific end. This, although unpleasant, is justifiably upheld by a wider view of the question. In commercial matters all round the marked tendency for some time has been the exploitation of large trading concerns at the expense of small ones. The great means to the accomplishment of this end is advertising. This, to reach its highest effective point, must appeal widely in a novel, attractive, and pleasant way. The natural result is that one trade has not the means and material within its legitimate bounds to do so for itself. It must trench upon the ground of others. The grocer sells patent medicines, the draper soaps and scents, the tea-shop crockery and ironmongery. Even the Olympian "Times" has taken to selling books on the instalment system of payment. The photographer has formed no exception in taking advantage of all this. He has been as ready to accept things at cost price, below it, or at no price at all, as anybody. In doing so he has made no inquiry as to whether it injured anybody or not. If he had, it would not have affected his action. The blame would have been put upon other shoulders, or the reception of the benefit classed under such a conveniently elastic apology as the result of the commercial methods of pushing firms in a progressive age. It is when our own teeth take to aching that we think toothache hard to bear. The ache in this case starts when soap and tobacco manufacturers begin to give photographs away. It is of little use discussing the morality of such transactions. Morality and commercial ethics are not necessarily co-related. They have not been, as far as that goes, long before this particular method of advertising came into vogue.

But there is no necessity, or gain, in sitting down to bewail unpalatable and unprofitable facts. Messrs. Lever, Ogden, and others are perfectly within their legal rights in giving anything they like away, and recipients will be humanly ready to accept them. There is, fortunately, balm in Gilead. It is out of natural order that valuable things should be given away for any length of time. And, even were they valuable, it is equally human that they should not be appreciated, from the mere fact of their costing nothing. "Nothing pay, nothing value." If of little value, as well as free, additional strength is given to the logical conclusion that this new advertising departure, after its first novelty shall have passed, will not tell for very much. It is not worth while getting excited over it. Better let it simmer gently down, than further aid the firms in question in advertising themselves by a show of pique and resentment.

However long the curative process make take, the incidence of the disease may be made to serve one or two very useful purposes. The formation of a league of photographers, as suggested, is one. This cannot but be of immense benefit in all directions. Its value is palpable in an age characterised by close combinations of all sorts and classes of workers. Anybody who reads a newspaper—and who doesn't, as far as that goes—can readily make out a long enough list of benefits for himself to justify such a course of action.

But, more broadly, it emphasises in the photographic field the general fact that the most fierce competition is found in the least skilled, least original, directions. We cannot but feel sorry for the medium grade photographer to whom, for the time being, this outside competition must mean, if not the knocking off of a portion of bread and cheese, hard enough to earn, at least of the accompanying scrap of celery that gives palatable relish. The cure does not lie in any hope of special protection, copyright or otherwise, but in the elevation of work altogether above the level of the soap and tobacco photograph. The worker who has carried his work above the plane of the commonplace is not at all worried over any such competition as that referred to. He knows very well that where brains are thrown in to help technical skill, the product will be free from cutting competition. Quality and originality will readily command high prices as long as the world lasts. The technical quality of the greater part of existing photographic work we must admit to be very high. No one can complain of the finish, smoothness, clearness, and polish of the prints in the professionals' windows and cases. But when it comes to any originality of treatment it is a very different matter. The pictures are vapid and colourless in the extreme. The wonder is that such geometrical posing and arranging, such woodenness of expression, such a complete reversion of what out of a photograph we regard as attractive and pleasing, should command even the price it does. The reason probably is that all is so bad. The opportunity is not afforded for the sense of contrast with good and natural work to tell. He who will step out of the orthodox groove need fear no cheap competition. He

will command his own price, and find working under the new conditions free from the tediousness of the old. No mere manipulator of curtains, a dark box, and chemical solutions, is he now, but a philosophical reasoner and user of brains as well.

The highest possibilities are not practicable, we will admit, in a studio, but far more is possible there than has been attempted. To take a case or two in illustration. A young girl, in profile, bending over a book, is immeasurably more natural and beautiful than trying not to appear conscious, staring straight in front. A mother and child looking into each other's eyes form the picture that we think worth storing away in our memories in real life. Why should the photographer make such efforts to catch and present both looking at himself? Most fathers reckon as happy moments those in which they have tried to explain the face of a watch to a youngster. Where is the pictured representation? The photographer regards it as more natural to show a boy on his father's knee, both watching the lens, one with a feigned, and the other a half-frightened, interest! And so on, instances and improvements will occur to any one who takes the trouble to think. If the photographer would only take the trouble to do so it would serve his purpose well. There is no reason either why the telling snap-shot, impracticable in the studio, might not be made so upon a broad open-air platform, with the light suitably directed upon it, at the side of the studio. Painters know the value of a creepered verandah in the composition of their pictures. Why cannot the photographer take this hint, both as an artistic aid and as helping out technically! It might mean a couple of plates extra, but two extra plates at fourpence would be repaid sixfold by even an extra two shillings for the dozen prints, and it would certainly mean much more than that. It is of no use saying that people will not pay the extra charge. They have not yet had the opportunity of refusing. Photography is no exception to the universal rule that a good things commands a correspondingly good price; nor to the equally universal law that mediocrity is appraised at its true commonplace value.

The application of my contention thus evidently is that if the photographer can turn out a high enough result, he can ignore all competition on a lower plane of work than his own. Messrs. Ogden, Lever, and the rest will certainly not compete with him if they are going to give such photographs away. They will not, as smart and reasonable people, attempt to do so. They are concerned with no higher idea than the practicability of applying the photograph as an aid to the selling of their special wares.—I am, yours, &c.,

April 28, 1901. OWEN GLENDOWER.

GLASGOW INTERNATIONAL EXHIBITION.

To the EDITORS.

GENTLEMEN,—In consequence of the number of letters I have received regarding this Exhibition, I think it desirable to intimate to the many amateur photographers who are likely to be in Glasgow during the summer that an extra dark room has been added, making three in all, which are at their service free of charge.

Further, any information regarding places worth seeing and photographing, also the easiest and least expensive method of journeying, will be given with pleasure. As bedroom accommodation is exceeding scarce, it would be well for intending visitors to book early.

The best hotels are St. Enoch's Station Hotel, Central Station Hotel, Windsor Hotel, St. Vincent Street, Grand Hotel, Charing Cross, and for those who wish a temperance house the Waverley Hotel in Sauchiehall-street is to be recommended. If an extended tour should be contemplated, arrangements have been made at my Edinburgh, Aberdeen, and Belfast establishments for the requirements of photographers.

To the amateur or professional a hearty welcome will be extended, and if any one is desirous of any information with regard to Glasgow and surrounding district, in view of their visit at this time, they need have no hesitation in writing to me, as I have made arrangements to supply any information required, and give every attention to visitors who may call personally.—I am, yours, &c., J. LIZARS.

101 and 107, Buchanan-street, Glasgow.

PHOTOGRAPHY AND THE FOURTH COMMANDMENT.

To the EDITORS.

GENTLEMEN,—It is not my object to alter the opinion of the "fully persuaded" "J. H. W.," neither do I wish to mulct him to the extent of £5 even for charity. No. My aim is to put before your readers the vast importance of restricting business and all work which is not imperative to six days a week; this is why I wrote my first letter to you, and I built my whole argument on God's immutable Fourth Commandment, and His revealed Will elsewhere in the Bible. To such as "J. H. W.," who must be touched with a remarkable sense of humour, I would point out that there is nothing "ludicrous" in sin, for "the wages of sin is death."

If your correspondent wishes to show that the modern world, wit the exception of the Jews, has no Sabbath because he calls our Sabbat "Sunday," he is building his statements on sand. The Fourth Com mandment of Almighty God our Creator reads: "Six days shalt tho labour and do all thy work, but the seventh day (or as the moder world wrongly calls it the "first day") is the Sabbath of thy God in it thou shalt not do any work," and so on, including all who com under our roof (employés, &c.). This and the other Commandment have never been abrogated, and though atheists, &c., &c., &c., and fals or nominal Christians, have tried to do away with them, or at leas to disregard them, yet they are as real and valid to-day as when the were given to the Israelites at the Exodus: Christ the Son of Go says: "Think ye that I am come to destroy the Law, or the Prophets I am not come to destroy, but to fulfil."—Matt. v. 17. If any ma does not believe in God and His laws, I would earnestly advise him t make an effort to do so, for at some future time every man shall appea before his Creator—God—to answer for his sins.

Business, whether mental or physical work, is perfectly legitimat and proper "six days a week," and we are told to do all our week' work in six days, for God's Law is strictly "obligatory" on the whol world (for every man is God's creation), and though "J. H. W." an others may strive to obscure it with mists of unbelief, yet it remain the same through all time, and in the eternity of after-time, God' Will will still be law, as every individual man, woman, and chil will discover.

It was not my original intention to explain the Scriptures in you excellent JOURNAL, but to arouse the photographic world in particula to the necessity of "six days a week" work. Therefore if assistants dc not wish to work on the Sabbath (the "seventh" or "first" day, whichever it may be called), they must not wait till employers repent and reform, but they must form a Photographic Assistants' Union, and show the grasping and grinding "seven days'" employer how to repent and reform.—I am, yours, &c., SIX DAYS A WEEK.

April 27, 1901.

To the EDITORS.

GENTLEMEN,—When "J. H. W." bases his argument for Sunday labour on Scriptural authority as binding to Jews and not to Christians, does he exclude the teaching of the New Testament?

There is no doubt a great deal to be said on the side of "J. H. W.'s" argument, if you take the actual letter of the Scriptures and ignore the spirit of its teaching. I hold that we should draw our authority from both Old and New Testaments, and from the spirit of its teaching, and not the letter only.

Our Lord kept the Jewish law by going to worship in the Synagogue, and in Matt. v. 17, he says: "Think not that I came to destroy the law and the prophets: I came not to destroy, but to fulfil." Now read on to verse 19: "Whosoever therefore shall break one of these least Commandments, and shall teach men so, shall be called least in the Kingdom of Heaven," &c. Christ came not to destroy the whole Jewish law, or to enjoin his followers to break the law. He came to fulfil the law. Here the Greek word *καταλῦσαι*, translated "to fulfil," means to give a full and true meaning of the law. In fact, the whole of the fifth chapter of Matthew teaches us how we ought to deal with this subject. The religion of Christ is a spiritual religion, and, as Christians, we must be guided by the spirit, not only by the letter of the Scriptures.

Suppose we take it for granted that there is no direct command deliberately telling us not to work on the Sabbath (whether the Sabbath be the first or last day of the week matters not), neither is there any command enjoining us to work. But there is undeniable Spiritual teaching which every true Christian is bound to uphold, and that teaching is against labour on the Sabbath.

I hope the verses I have cited will induce "J. H. W." to carry out his offer of helping a charity.—I am, yours, &c.,

H. EDMONDS HULL.

Holland Park-avenue, W.

BROKEN NEGATIVES.

To the EDITORS.

GENTLEMEN,—We note your report in the current number of THE BRITISH JOURNAL OF PHOTOGRAPHY of the broken negative case at Grantham, in which we were the defendants, and will ask you in fairness to us to allow us to make a few remarks in reference thereto. The consignment contained two parcels. Part of the packing only of one was brought into Court. The outside paper with our label showed no evidence of being used for the particular parcel containing the negatives. This point was noticed by the Registrar, who was in court. The goods were sent at the passenger train rate, and not at the ordinary rate, as reported. The Midland Co. received from us the goods, and signed for 2s. to pay carriage. The G.N.R. Co.'s witness declared 6d. was the amount paid. The whole case is a mystery to us. If there is one thing we are sure of it is that the packing was properly and

fully done. To this fact we have a number of witnesses to swear. certainly have never come across in the photographic business any ter ass enough to send goods out in the way in which the plaintiff re these were received. The whole thing is preposterous! Having ight no witnesses, I asked the case to be dismissed as against us, re delivered the goods into the hands of the Midland Railway Co., ining their signature for same, in proper condition, and that as plaintiff sent us the money to pay for the carriage the Company me his agents and not ours; the G.N.R., who delivered, being urn the agents of the Midland Railway, and Sutton's, who delivered rantham, agents of the G.N.R. We have not finished with this yet, but think it due to us that your readers, who are so largely customers, should know that we are not in the habit of sending out atives packed in the absurd fashion that these particular ones e supposed to have been packed.—I am, yours, &c.,

CRAYON, LTD., F. A. Venning, Managing Director.

9B, Brecknock-road, London, April 27, 1901.

PYRO PRESERVATIVES.

To the EDITORS.

ENTLEMEN,—Mr. Kenneth Mees, in his paper on developers in your e of April 26, states, in regard to the preservative, "In my opinion should be either sulphite or metabisulphite. From theoretical sons, it seems to me that the latter should be the best."

n the particular case of pyro, it does not appear to me that either hese preservatives alone is quite satisfactory. Sulphite alone pre- ves the developing power fairly well, but not the colour of the ution. Metabisulphite alone keeps the solution almost colourless, does not preserve the power of development very well unless you a considerable quantity, in which case you have an objectionable ess of acid. A mixture of the two, however, answers admirably, I find that the following proportions give a solution that will keep long as is likely to be desired:—

Pyro	One part by weight.
Sulphite	Two parts by weight.
Metabisulphite	Half part by weight.

her a ten per cent. or 1 in 60 solution of pyro keeps well if these portions are kept for the solids.

udging from the behaviour of various solutions made up by different mulæ, it appears that sulphite preserves developing power, while phurous acid preserves colour. The sulphurous acid can, of course, provided in various ways, and two years ago I made up three pyro utions, one preserved with sulphite and sulphuric acid, one with phite and citric acid, and one with sulphite and nitric acid. For ne months all three remained equally colourless, but I have recently ne across the bottles again and find that the last two have become leep brown, while the first, containing the sulphuric acid, is still al- st colourless after two years. Perhaps the sulphite and sulphuric d preservative is second to, if not equal, to the sulphite and meta- ulphite mixture. This latter preservative can be used with any veloper except glycin, though with some, metol, for example, the sence of sulphurous acid is apparently quite unnecessary.

The action of nitric acid alone in preserving pyro seems to be some- at mysterious. It certainly does not preserve colour for any length time, and it is difficult to see why a powerful oxidising agent should serve developing power, though it appears to do so to a certain tent.—I am, yours, &c.,

C. WELBORNE PIPER.

April 27, 1901.

PHOTOGRAPHIC OPTICS.

To the EDITORS.

GENTLEMEN,—In your issue of the 26th inst., you draw attention to at you justly call a lamentable absence of knowledge of this subject. There are no doubt many reasons for this state of things, but there one which I will ask you to allow me to point out. It is the extra- dinary confusion that appears to have existed in the minds of certain iters on photographic optics in this country with regard to the rms employed to denote some of the fundamental principles of the bject; and as the result of this confusion, we have periodically what now so well known as the "depth of focus question," and which is a ritable terror to any one approaching the subject for the first time. show that this question is still alive, and in an exceedingly robust ndition, I need only refer your readers to the pages of "The Tra- ller" of March 2 this year.

It unfortunately appears that the late Mr. J. H. Dallmeyer, to whom otography owes so much in other ways, was the first to sow the eds of the confusion I am referring to. In a pamphlet, "On the oice and Use of Photographic Lenses," he wrote as follows:—"Depth focus, or depth of definition, is dependent upon the aperture *and e focal length* of a lens." The sentence I have italicised shows that r. Dallmeyer is evidently referring here to what should, scientifically, be called depth of field and not depth of focus, because the latter does not vary as the focal length to more than an insignificant extent. On the principle of "What's in a name," it might be argued that one term is as good as another, and that, having at the outset employed the term "depth of focus," it would be better not to change it; but this is hardly sufficient to warrant the retention of a term which is scientifically incorrect; and, moreover, if depth of focus is used to denote depth of field, we should require some other term to indicate the true depth of focus. Mr. Dallmeyer then goes on to say, "It" (*i.e.*, depth of field) "increases in the same ratio as the diameter of the aperture is reduced, and it diminishes as the square for any increase in the size of the picture or the focal length of the lens." We have here two statements, both incorrect. It is quite true that depth of field increases as the aperture is reduced, but not exactly in the same ratio. The second statement, which is to the effect that if, for example, you double the focal length you obtain only one-fourth the depth of field, is very far from being correct. The diminution is in some cases much more rapid. Take, for instance, a 5-inch and a 10-inch lens, both working at *f*-10, and focussed on an object at a distance of 200 inches: then the depth of field with the 10-inch lens is only one-tenth of the depth of field given by the 5-inch lens.

I could give you many instances to show how subsequent writers on photographic optics have blindly followed Mr. Dallmeyer in this matter, and hence the confusion as to the proper use and meaning of the terms they employ.

This question can never be made intelligible, without the correct use of three distinct terms, viz., "depth of focus," hyperfocal distance," and "depth of field," and as soon as these are understood the photographer will find that he has made a real advance in the study of photographic optics.—I am, yours, &c.,

April 29, 1901. W. B. COVENTRY.

THE POISONS ACT.

To the EDITORS.

GENTLEMEN,—I notice your correspondent, "Mr. J. Osborne," being unable to take up an issue with Mr. Dobbs, and the excellent Bill his Association are now promoting, falls out on my proposal for licensed vendors of poisons who can satisfy a "simple examination in poisons." Surely no intelligent reader of my letter would for one moment associate this with the examinations set by the Pharmaceutical Association for qualifying druggists to dispense medicines, a sphere of labour which certainly should be restricted to thoroughly qualified persons. But those exams. cover far more than poisons and their sale, and I maintain any intelligent shopkeeper can easily learn—without any expenditure of "Mr. Osborne's" midnight oil—whether any poison that may be asked for requires the purchaser's signature or merely a poison label. If he has this knowledge, and a reasonable amount of business acumen, he is as well qualified to retail a poison as any member of the Pharmaceutical Association. I would put the examination for the poison traders' licence under the Excise, but certainly leave the examinations in medical dispensing under the P.A.—I am, yours, &c.,

FAIR TRADE.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

CYANOTYPE.—Citrate of iron and ammonia was probably meant.

R. GUILLAUME.—We do not quite understand your question. Mr. Mees gives the formula for a combined resorcin-hydroquinone developer on page 264 of last week's JOURNAL.

THOMAS KING.—We append a formula by Messrs. Lumière:—Hydramine 5 grammes or 2½ grains, sulphite of soda 14 grains, caustic lithia 3 grammes or 1½ grains, water 1000 c. c. or 1 ounce.

HUMANUM EST ERRARE.—Neither registration nor patenting is essential: being sold as secret preparations you run comparatively little risk. If the solution contains an unscheduled poison you are safe from molestation.

J. STANLEY.—(1) Probably pyro soda or pyro ammonia. (2) By the latter most likely. (3) Messrs. Hazell, Watson and Viney, Creed-lane, E.C., publish a little book on cinematography, by Mr. Cecil Hepworth, which may be of assistance to you.

LEEDS.—We fear we cannot help. It appears to us a matter for legal advice which we recommend you to obtain.

FORMULA WANTED.—"SEPIA" writes: I should be greatly obliged if you could give me the formula for toning bromide prints with uranium."—In reply: Two are given with directions on pages 962 and 963 of the ALMANAC for 1900.

FERNHEAD.—We regret we can give no further information than that contained in the paragraph we quoted; other methods of purification are detailed in a little book on "Acetylene Gas," by G. F. Thompson, published by the author at Lombard Chambers, Bixteth-street, Liverpool.

APPRENTICES.—"PYRAXE" writes: "Will you kindly inform me the usual terms for girl apprentices, age about fifteen years?"—In reply: There are no usual terms. It is merely a matter of mutual arrangement between the parties, and they are based upon the status of the photographer and the class of business he conducts.

THE JOLY PROCESS.—A. C. IRELAND writes: "Will you please let me know where information about and the necessary apparatus for the Joly three-colour ruled screen colour process may be obtained?"—In reply: Messrs. Newman and Guardia, Shaftesbury-avenue, W.C., were formerly the agents. Perhaps they still supply the screens.

PROTECTALINE.—"VARNISH" writes: "Will you kindly tell me if "Protectaline," negative varnish (used cold), and manufactured by the Fred Crane Co., Birmingham, is really good and lasting?"—In reply: Personally we have not tested this varnish, but we have reason to believe it is a trustworthy one. We believe that its odour is not pleasant to every one.

BLINDS FOR STUDIO.—"SHAMROCK" asks: "Will you please let me know what class material is most suitable for the top and side shading blinds for studio, and where same may be obtained?"—In reply: Ordinary window holland is as good as anything, and it may be had at any upholsterers. Its colour should be governed by the aspect of the studio.

POISONS IN PHOTOGRAPHY.—"BRANDON" writes: "(1) If I mix up a thirty grain sulpho-cyanide and gold toning solution, by order from amateurs, and charge a small profit for same, do I make myself liable under the Poisons Act? (2) Do pyro soda developers come under the same?"—In reply: (1) See answer to Holliday and Co. (2) No, certainly not.

FINDERS.—J. B. R. S. asks: "Is there any view-meter made which can be adjusted so as to show the exact picture which a lens of a given focal length will project on quarter-plate? A hand camera would in many cases have its capabilities greatly increased if this could be known when required."—In reply: Yes; Messrs. Dallmeyer supply such an instrument, so do Messrs. Adams and Co., and, we think, others.

COPYRIGHT.—H. R. M. writes: "A suggests to B (the photographer) that he should photograph C. No fee is charged at time of sitting either to A or C. Nor is any intended to be charged to C (the sitter). Has B the right to sell proofs, and does the copyright remain with B (the photographer)?"—In reply: Yes, if he has the permission of C to do so. Or, if he gives C a "valuable consideration" for the sitting.

A. L. BIDEN.—(1) A test tube is a long narrow tube of thin glass that will stand heating. If you followed the directions you should have got a clear solution. Warm it over a spirit lamp. (2) High temperature pyroxyline may be had from Messrs. Hopkins and Williams, Cross-street, Hatton Garden. (3) It should have a somewhat opalescent appearance. (4) Filter through very fine muslin. (5) No, it will not.

ENGRAVINGS.—"DEALER" writes: "A customer wishes to purchase suitable engravings, &c., to furnish a new house, but wishes to see a descriptive illustrated catalogue for selection. Can you tell me from whom I can obtain same? Standard works chiefly are required."—In reply: Messrs. Graves, Pall Mall, or Messrs. Haenfstaengl, Pall Mall, supply engravings of the highest class. Better write those firms.

FORMULA WANTED.—G. TURNER and Co., write: "Can you acquaint us with the formula for producing sepia toned enlargements on bromide papers, or tell us where a book upon the process can be obtained?"—In reply: The simplest way is by toning them with uranium. There is no book published on the subject. But much information on the subject will be found in back volumes of the JOURNAL and the ALMANACS. Formulæ and methods are given in the ALMANAC for 1900.

TONING P. O. P.—"TROOPER" writes: "I have been using for a considerable time a P. O. P. which, when toning, I plunge into the bath without previous washing, also direct into fixing bath without washing after toning. I can get capital tones with this paper, and the maker guarantees it to be absolutely permanent. Do you think I need fear anything in continually using it? I would like your opinion, and would like you to say what you consider the disadvantages are in using such a paper?" In reply: We much prefer to wash the prints before they are toned, and, again, before fixing them, and do not mind the little extra trouble involved. We do this because we think that it conduces to greater permanence. We should be sorry, however, to affirm that prints not so treated would not last for a long time.

ADDRESS WANTED.—COL. GUBBINS writes: "I wrote some days ago t Mr. E. Openshaw, 24, Ward's Buildings, Deansgate, Manchester (the address given on the title page of his Note-book of Photography), on the subject of his book; the letter has been returned through the D. L. Office, marked 'Gone.' Can you tell me his address?"—In reply: We do not know Mr. Openshaw's present address but perhaps the publication of this query may bring the desired information.

SUPPORT FOR LANTERN SLIDES.—C. K. T. asks: "(1) Is there any support suitable for lantern slides except glass and celluloid? I want to send a number abroad. Glass is too heavy; celluloid too inflammable. (2) There is an article in one of the hand-books on "Porous and skinny collodion," stating how to insert a face in a group. Can you tell me where to find it?"—In reply: (1) Possibly the Cristoid film would answer your purpose. Write to the Sandell Film Company, South Norwood, S.E. (2) On page 774 of the ALMANAC for 1896.

COLLODION EMULSION.—H. FRANKLIN writes: "Could you recommend me a formula for making a collodion emulsion that would be suitable for manufacturing a dry positive ferrotype plate, using an ordinary alkali and hydroquinone developer; would any collodion emulsion answer my purpose, as I am informed it would?" — In reply: On pages 1075-6 of the ALMANAC are several formulæ for collodio - bromide emulsions. One or other of them with slight, or no, modification will, no doubt, answer for positives. We should advise you to try No. 1, first.

A PHOTOGRAPHER'S HOTEL.—"COUNTRY PHOTOGRAPHER" writes: "Kindly tell me if there is an hotel in London which caters for photographers as some do for cyclists? It is not cheapness wanted but to meet with some one in the same line. To a country man going to London once a year, it seems a great wilderness."—In reply: There is no such hotel. But if our correspondent attends the meeting of the Photographic Club on a Wednesday, or that of the London and Provincial Photographic Association on a Thursday: he will, no doubt, be made welcome. Let him call on us first, and we will put him in the way of an introduction.

OPTICAL PROJECTION.—"PHOTOPHIL" writes: "(1) I should be grateful for your opinion as to whether a triple lantern of the usual sort and size can be satisfactorily worked by three arc lamps, dynamo, and petroleum or benzine motor. What strength of arc light for working with the usual three-inch lenses at sixty to seventy feet from the screen on linen or cotton sheeting? (2) Which is best, automatic or hand fed lamps? I rather think the automatic want a good deal of attention. (3) I always find that spectators in front and centre places get a disagreeable glare from the objectives (when working by translucence), which, in a great measure, overpowers the picture. This I attribute to the light getting through the interstices of the fabric. What do you recommend to obviate this?"—In reply: (1) A light of from 500 to 700 c. p. would yield a good light at that distance. (2) An automatic lamp should require no attention when once the arc is adjusted. (3) By using an opaque instead of a translucent screen, the picture will then be brighter.

VARIOUS QUERIES.—"YORKS" asks: "(1) Would Zeiss single anastigmatic lens, series VII., focus twenty-seven and a half inches, be equal to a good quality R.R. lens of same focus, and used at the same aperture, for portraits and groups—fifteen by twelve size? (2) If in photographing an interior of dark woodwork and light stonework, I under-expose for the dark parts, and over-exposure the light, would you suggest any alteration in developer (pyro and ammonia), in order to get all possible detail in woodwork, without getting too harsh a negative? —(3) Re article, April 5, "Dye for Negatives," will ordinary packets of dye sold by chemists answer?"—In reply: (1) We should prefer the R.R. because it can, at times, be used for smaller pictures with its full aperture, and in that case would be much quicker in action. But the other is a good lens. (2) Use a diluted developer, with a minimum of bromide, and allow plenty of time for its action so as to get out all the detail before density is acquired. (3) We cannot say, as we have had no experience with them. Better get them from the manufacturers or their agents.

POISONS IN PHOTOGRAPHY.—HOLLIDAY AND CO. write: "In last week's 'Optician' there is a letter from a member of the 'Pharmaceutical Society,' in which he distinctly states that ammonium sulphocyanide and potassium oxalate are not, and never have been on the poisons schedule of Great Britain. We should like to know for certain, as we do not want to be pulled up for selling combined bath containing sulpho-cyanide. The same writer also states that the examinations of the Pharmaceutical Society are open to all. Is it practicable for a photographer to pass this with a reasonable amount of study and cash? If so, one of us will go through, and if we did we should not stop at photographers' chemicals, as we have a splendid opening for pills, lime water, &c."—In reply: Oxalate of potash, or the oxalates, are not scheduled in the Poisons Act of 1868, though the oxalates are in the Irish Poisons Act. In the English Act all metallic cyanides are scheduled. There was a conviction in a Dublin Court, a short time ago, for selling sulpho-cyanide of ammonium, but we do not know of any such case in England. It would seem stretching the law to make this a poison within the meaning of the Act. Write to the secretary of the Pharmaceutical Society, Bloomsbury-square, W.C., who will supply particulars about an examination.

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EX CATHEDRÂ.

e Professional hotographers' ssociation.

Our readers in all parts of the country who are interested in the recently established Professional Photographers' ssociation will, no doubt, be glad to learn what progress is ing made in the preliminary work of organization that ust necessary follow the formation of an Association at open public meeting. It may be useful, therefore, if we iefly recapitulate the steps that have been taken since the thering at Anderton's Hotel, London, on March 28. he Provisional Committee then and there appointed has ld a meeting, the results of which were communicated to r readers on this page of the Journal for April 19. Since en the Rules Sub-committee, appointed by the Provisional mmittee, has been closely occupied in drawing up a set of les, and that special piece of work we are glad to say is now mplete, and will be placed before the General Committee, hich meets this (Friday) evening, May 10. Next week e hope to report further progress. As we have already pointed out, it is no easy thing to draw up a working scheme which shall suit the special requirements of professional photographers associating themselves together for purposes of mutual interest and protection; but we are confident that with due care and deliberation a successful result will be speedily achieved, and that in a very few weeks from now every professional photographer in these islands will be directly invited by the Provisional Executive to join an Association, whose object will be to improve and elevate the status of a great profession. Meantime, may we again remind our readers that the principal officers are Mr. William Grove, Treasurer, 63a, Baker-street, W., and Mr. Alfred Ellis, Honorary Secretary, 51, Baker-street, W. In the preliminary work a considerable amount of expense will have to be incurred, and those of our readers disposed to help financially in the matter will, no doubt, find in Mr. Grove a cheerful recipient of their contributions.

* * *

Haze in the Studio.

In an article a short time ago we alluded to the shabby and dejected appearance of many photographic studios, due to the neglect and slovenliness of their owners. That may not mar the photographs as photographs, but there is another result of it that may, namely, dirty windows. Some appear to imagine that the only effect of dirty glass is to prolong the exposure, but that is not all. When the sun is shining on the roof and sides of glass begrimed with soot and smoke it shows as a haze between the sitter and the lens, and thus mars the brilliancy of the image. This will be most manifest when the sun is low, as it is in the earlier hours of the morning and the later ones of the afternoon. Of course, the farther the camera is from the sitter the greater will be the lack of brilliancy in the negatives. When the sun is not shining on the glass the haze is not seen, and the chief harm done by the smoky glass is to prolong the exposure. The cleaning of the outside glass of a studio is sometimes not a very easy matter unless it can be readily got at. When that is the case a mop and a few cans of water will soon do the needful. Cleaning the inside is, however, somewhat troublesome, particularly the

glass of the roof; in fact, it is a back and arm-aching job when done in the usual way of window cleaning. The simplest and quickest way of doing the work, and that is what we wish to point out is this. First thoroughly wash off the dirt with a sponge and clean cold water. Then with a soft rubber scraper squeegee make one firm stroke with it from the top to the bottom of the pane. This will practically leave the glass perfectly dry and quite free from smears, which are often left when it is dried with cloths or leathers. If the squeegee is of the same length as the width of the glass so much the better, as then the pane is covered by one stroke, if not it must be done by two strokes. We should not have alluded to such a simple subject as cleaning windows, but many do not appear to be aware of the value of the familiar photographic squeegee in simplifying the work when cleaning the studio windows.

* * *

Prints and Engraved Plates. There have been several auction sales of engravings of late, and the prices realised have been, in some cases, very high. At one sale alone last week over £2600 was realised; the prices of some of the prints reached from £30 to £190. We read that the record price of 1160 guineas was paid for a single print at Christie's a week or two ago. We are sometimes asked by correspondents, who may happen to have a very old engraving, to give an idea of its value. Now, the value of an engraving is not dependent upon its age, but the quality of the impression, the engraver, and the artist from whose picture the engraving was made. The oldest engravings were on copper plates, and they quickly deteriorated in the printing, consequently the earliest impressions were, of course, the finest. We were once told by one of our first copper-plate printers that a connoisseur could detect a marked difference between the first and the twentieth impression from a copper plate. In the case of steel plates the deterioration is not nearly so rapid as in the case of copper, by reason of the harder metal. Some years ago the method of "steel facing" copper plates was introduced—that is depositing a thin film of iron, of a very hard character, upon them by the electrotype process. By this means they become as durable as if they were actually steel plates; indeed more so, as they are practically everlasting, for when the steel surface begins to show signs of wear it can be removed by immersion in a dilute solution of sulphuric acid, and then be resteeled. But for the steel-facing, "photogravure" plates, by reason of the delicacy of the grain and the softness of the metal, would only yield a very few prints of the best quality; now they will, and do, yield thousands. It might be thought that the coating of iron would impair the delicacy of a photogravure plate, but it does not do so in practice, because it is found that the deposited "steel" has a greater ink-holding property than the copper itself would have. It is for this reason that all photogravure plates are steel-faced —sometimes even before a single proof is taken from them— because the steel can be so readily removed before the plate is retouched by the engraver.

* * *

An Ill-used Process. At the Building Trades Exhibition held recently at the Agricultural Hall, we were struck with the extensive use the exhibitors made of photographs to illustrate their products, and the applications of them. There was hardly a stall at which photographs were n shown, and from the photographers' point of view th Exhibition was perhaps more interesting on account of th photographs than on account of the actual material exhibite A large majority of the photographs were obviously th work of professional photographers, and, while they we generally admirable in technique as far as the negatives we concerned, the prints themselves frequently left much to l desired. From among them a typical collection might ha been made of examples of the various defects that may l introduced into a gelatino-chloride print. There were doub tones, treble tones, uneven tones, fancy tones, blue tone and perhaps even more varieties. Of prints beyond criticis there were, of course, many also, but the proportion of suc was not what it ought to have been. Gelatino-chloride pap is now produced of such uniform and excellent quality, an there is such a choice of brands, that there is no excuse fo any photographer not knowing how to produce results a least equal to the average of what was produced on albu menised paper; but, judging by the specimens in this E hibition, the average quality of prints has deteriorated, n improved. We suppose that the majority of photographe would agree that the gelatino-chloride process is an improv ment on the earlier albumenised paper process, otherwise wh should the one have been abandoned for the other? It rather a curious state of things to find an improved proce producing worse results.

* * *

Photography at the Alexandra Palace. The opening of the Alexandra Palace o May 18 as a place of recreation, unde the auspices of the Middlesex Count Council, in co-operation with other local municipal bodie is matter for congratulation. It is intended to give fre admission to the building generally, the theatre and th small concert hall being, we understand, the only parts t which admission fees will be charged. One of the attrac tions will be the picture gallery, and there will also be a exhibition of photographs. The management of the latte is in the hands of a capable Committee, who may be truste to make the best of the limited space at their disposa Apart from ordinary considerations, this little exhibitio of photographs deserves more than a passing notice, fro the fact that it will mark the first instance in the metr politan district of a public body recognising that phot graphy is worthy of a place among the graphic arts. But limited section of the community have any idea of the stag that has now been reached in pictorial photography, for, out side photographic societies' exhibitions, pictorial photo graphs are rarely to be met with. A photograph, to th average individual, means a silver print, and the mention o the word, probably, in most cases suggests a cabinet portrai or a cricket or football group. Among the thousands tha will visit the Palace during the coming summer we may fairl assume that to the majority the kind of photograph the will see there will be entirely a novelty. Photographers ar all interested in the standard of the public taste being raise as regards photography. That this exhibition will have distinct effect in this direction is hardly to be expected; but nevertheless, we should be thankful to the Trustees of th Palace for the opportunity that they have given us of afford ing the masses some insight into the possibilities of photo graphy.

CHEMISTS AND PHOTOGRAPHIC MATERIAL.

OUR contemporary, the "British and Colonial Druggist," in a recent issue, favours its readers with some ten or twelve pages of more or less pertinent advice to chemists as to the advisability of adding to their stock various items of photographic goods. Of course, we are aware that this kind of advice is merely a repetition. Hundreds of chemists up and down the country "go in for" (this is the correct term, we believe) photographic materials; from our own observation we should say that the average of these so-called dealers merely "dabble" in this class of goods. We now and then disagree with our esteemed contemporary, but we recognise to the full that the chemist has his uses—and limitations. From a study of the chemist's shop dating back thirty years at least, it is clear that it has become to a great extent a sort of dust-bin for various trades and professions. We are aware that the chemist is a man who has spent a lot of time and money in order to qualify himself for business, the legitimate practice of which occupies only a fraction of his time, hence probably his frequent inroads into the domains of other professions of inviting aspect. When we say dust-bin we do not intend any disrespect to the chemist, but we imagine even our contemporary will concede the term; dust and bin are words which aptly describe the normal condition of some London and not a few provincial pharmacies.

The modern chemist must surely by this time have his hands full, practically all his irons must be in the fire. Amongst the great variety of goods stocked and sold by the average chemist which we have seen displayed are bath bricks and floor cloths, dish covers and chamber ware! These, with the paints, oils, varnishes, sash tools, and dry colours make a pretty fair assortment of stock, not to mention the spectacles and optical goods which adorn one corner of his window, or the meagre collection of dusty stationery which helps to fill and lends an attraction to the other. In addition to these and other items which may occur to our readers, as, for instance, farm and garden stuff, seeds, and sheep-dip, we believe many chemists essay the extraction of teeth. Their general knowledge also is popularly supposed to be encyclopædic; from whitewash to black, things visible and invisible, the war and X rays, the geography of Klondyke or the truth about Dreyfus, the chemist is expected, so to speak, to write out the graphic formula of each, and add whatever fanciful embellishments may occur to him. Enough has surely been said to show the diversity of the modern chemist's stock; it is clear that his time must be fully occupied in attending to the multifarious, if ill-assorted, collection of stores assembled under his roof, and it seems to us that to burden him further with photographic goods is a mistake. The trade in photographic apparatus and material belongs, by all rights, we think, to the photographer. At least one professional photographer in every town would undoubtedly find it to his advantage to stock material for the use of his brother professional or the amateur. There is no tradesman better fitted to do this, and in these days we doubt whether there is any successful professional worker, successful in the sense that he has caught the public eye and fit the public taste, but has his advice asked by his clients in the selection of apparatus, and possesses, in many cases, willing or unwilling, the nucleus of a trade in such material; in more than one instance to our knowledge the business involved amounts to hundreds of pounds yearly. Apparatus, material, and so on, including the framing of pictures, might come much more than is the case into the hands of photographers; the development and treatment of negatives, printing, enlarging, and mounting should not only be catered for in the usual way of business, but with some special reference to the amateurs' requirements. We do not forget that there has often been friction between the amateur and professional; the former has often been blamed by the latter for a variety of sins of omission and commission, but, after all, this is mainly a matter of management and business. We do not suggest that the professional should essay the whole work of a studio and shop in his own person: it should be made clear from the outset that to him time is money; he may be the ruling spirit, not the drudge; for the rest the management and care of apparatus, &c., comes well within the scope of women's labour.

The professional is at a disadvantage, however, in one important respect—that is in the matter of discounts; in some cases, though actually selling the goods he is mulcted to the extent of ten per cent. above the actual trade price; he may get photographers' discount, but not trade discount. This is a matter that calls for attention. If a professional owns a shop for the bonâ fide sale of material, he is certainly entitled to full discounts. It is strange, to say the least, that so many wholesale dealers object to this rightful concession, when at the same time they, many of them that is, possess retail stores and appropriate the double profit. It is a well-known fact that many dealers at the present time do printing and enlarging, and the like operations, getting for the same not only the current rates for such work, but the trade discount off the material used. We certainly think the professional photographer should have his full share of any profits to be made by the sale of apparatus and material, a much larger share than he gets at present. There is the "poison difficulty," but this is not insuperable, as the flourishing condition of some photographic stores clearly indicates. We admit that the chemist is quite at liberty to touch these goods, as he already dabbles in many others. It is this "dabbling" that is so objectionable; but the work could be so much better done by the photographer, or under his eye, and if it is a question of the chemist or one of our own friends, we confess a preference for the latter.

THE STABILITY OF COLLODION AS COMPARED WITH GELATINE NEGATIVES.

IT seems to be a pretty general opinion that gelatine negatives, as regards their stability, leave something to be desired. We are, of course, not referring solely to stained and deteriorated negatives, due to want of care in the manipulations, imperfect fixation or washing, or printing with damp paper and the like, but more particularly to the fading of the more delicate portions of the image where, presumably, every care has been bestowed on their production. This is doubtless the case with the star negatives taken under the international scheme for mapping the heavens; yet Dr. Roberts has found that, after the lapse of eight or nine years, about one-third of the familiar stars have disappeared from the negatives. If these faint images have faded out it may fairly be assumed that the same would be the case with the more delicate portions of an ordinary negative. Hence there would be a certain amount

of deterioration in the quality of the picture by reason of a loss in the more delicate portions of the image.

We recently had the opportunity of seeing a large number of very fine negatives—landscapes, buildings, interiors, &c., on plates eight by five inches, taken stereoscopically. They were taken, commercially, in different parts of Europe something like thirty-five or forty years ago—in the early sixties—by a then well-known photographer. It is needless to say that they were by the old wet collodion process, and that the plates were all prepared and developed on the spot. They were of course taken by the only lenses that were then available. Still, they are as perfect as they could possibly be; there is no distortion of the marginal lines in the interiors, although, in many instances, a very wide angle is included, and the images are perfectly sharp up to the extreme corners. Indeed, it is difficult to conceive, when seeing these pictures, how anything better could be obtained by the very best of modern lenses.

The negatives being on collodion they are, of course, of a very different character from those taken on gelatine plates. They are very vigorous, being strong in the lights, while the deepest shadows are represented by absolutely bare glass, but there is a perfect gradation of tones from the highest lights to the darkest shadows. On account of their great vigour these negatives are scarcely so well adapted for printing on the modern gelatine emulsion papers as they are on the old heavily salted, and highly sensitized, albumen papers that were in vogue at the period when they were taken. By the platinotype or the carbon processes they yield excellent results. We are, however, rather digressing from the point we have in view, namely, in directing attention to the permanence of the results by the wet collodion process. Although these negatives have been taken for over thirty years, some, we believe, forty, none of them show the slightest trace of deterioration either from fading, or stains, yet they have had, some of them at least, hundreds of prints made from them in the ordinary course of business. The only blemish to be seen in any of them is a slight scratch on a few, resulting from carelessness on the part of the printers. The absence of these blemishes, after so much use, proves that a very hard and durable varnish was used for protecting them.

The interesting point is, can such stability be predicted for gelatine negatives after a lapse of a similar period? The subject is an interesting one, and is one we have little real data to go upon because there are no gelatine negatives of that age, and which have been subjected to the same test, the only true one—time. But the experience of Dr. Roberts with the star negatives does not seem particularly hopeful. Apart from the film in which the image is, it must be kept in mind that the way in which it is formed differs materially in the two processes. In the gelatine film there is no free nitrate of silver and the image is formed by the reduction of the silver in the bromide by the alkaline developer. In the case of the collodion process there is free nitrate of silver, both in the film and on its surface, and that is reduced to the metallic state by an acid inorganic developer; and in the intensification of a collodion negative more silver, in the metallic form, is precipitated upon the image. Also the collodion film has, unlike gelatine, no tendency to form an organic compound with silver; neither has it any affinity for water as is the case with gelatine. Again the majority of collodion negatives were fixed with cyanide of potassium, instead of hypo, and the film being so e tremely thin and, at the same time, having no affinity f water as gelatine has, it was quickly, yet thoroughly, free from everything of an injurious nature even when hyp was employed as the fixing agent.

We have here but briefly and cursorily alluded to th wide difference there is in the principles involved in the tw processes — collodion and gelatine — because there are large number of photographers, both professional an amateur, who have taken up photography during the la decade or two who do not realise how great is the diffe ence, in principle, between the two processes.

In the collodio-bromide process there is a somewha greater analogy between it and the gelatine process tha there is between that and the wet collodion proces inasmuch as there is no free nitrate of silver present, an the image is formed by the reduction of silver from th bromide by an alkaline organic developer. But here again, it should be mentioned that the intensification when that is necessary, is by the precipitation of mor metallic silver upon the image. With this process eithe cyanide or hypo could be used to fix the picture, and th film, like that in the wet process, has no affinity for organi compounds of silver. It has also to be varnished before i can be printed from, so that it does not become contamin ated with silver from the paper.

As the collodio-bromide process has been before th photographic world now for some five and thirty years, an many of the earliest negatives that were produced by i must still be in existence, it would be interesting to learn if any of them, as yet, show signs of deterioration.

NOTES ON SOME OLD LENSES.

I.—Charles Chevalier's Objectif à Verres combinés à Foyer variable.

Some weeks ago the firm Carl Zeiss had the opportunity of pur chasing, through the aid of Dr. P. Culmann, an old Chevalie doublet, a type which has hitherto been but superficially known Charles Chevalier himself looked upon his objective—in fact, the firs photographic doublet—as the model of portrait objectives, and we specially of opinion that J. Petzval's portrait combination was onl an imitation of his own original type. Although his opinion wa contradicted from the beginning by J. Petzval's friends (J. Reind for instance), and, moreover, time and purchasers unanimously decided in favour of J. Petzval, it was a matter of great interest to me to ascertain in which way Charles Chevalier solved the problem of constructing a sufficiently rapid negative.

The old mount bears the inscription: "Photographe à Verres Combinés Inventé par Charles Chevalier, Ingénieur, Opticien, Palais Royal 163, à Paris." No number is given, so that it is impossible to exactly date this specimen. But I am probably not wrong in ascribing it to the forties. My reasons are the following. From books published by Charles Chevalier we know that he lived in 1844 at Palais Royal 163, whereas in 1856 we find his address to be Palais Royal 158 (the exact date of the change is not known to me). Further, in later years his lenses are described by him as "Objectifs," whereas here the inscription "Photographe" occurs. It is in accordance with the assumed date that we find the front edge of the mount provided with screw-holes. They were intended to hold the reversing mirror or prism, a contrivance necessary for the Daguerreotype process then in vogue in France, and therefore never omitted in contemporary catalogues of photographic objectives.

The lenses were taken out of their cells and the cemented surfaces separated in order to ascertain the radii. It was observed that the

h of the surfaces and the centering of the lenses were unmonly good. Afterwards the pairs were recemented and a small e surface was ground at the edge in order to be able to ascertain refractive indices by means of a refractometer. Dr. Fr. Löwe kind enough to do this for me, and it is in accordance with his surements that I am able to publish the following values of retion and dispersion. We know from Charles Chevalier's papers he purchased his optical glass from Th. Daguet's (A. Guinand's) ks near Neufchatel, and it is perhaps not without interest to have data of optical glass at a time when glasses for sale were exively produced in French-speaking countries.

	n_D	ν	Dispersion between the lines C and D	D and F	F and G1
t lens of the back combination:	1·6199	36·7	0·0169	0·0121 0·72	0·0102 0·60
t lens of the front combination:	1·6257	35·7	0·0176	0·0126 0·72	0·0106 0·60
wn lens of the front combination:	1·5185	61·0	0·0085	0·0060 0·70	0·0048 0·56
wn lens of the back combination:	1·5220	57·9 ?	Owing to unfavourable circumstances the values are not reliable.		

he optical properties of these glasses closely resemble those of ate flints (dense flints) and silicate crowns (hard crown) of our e.

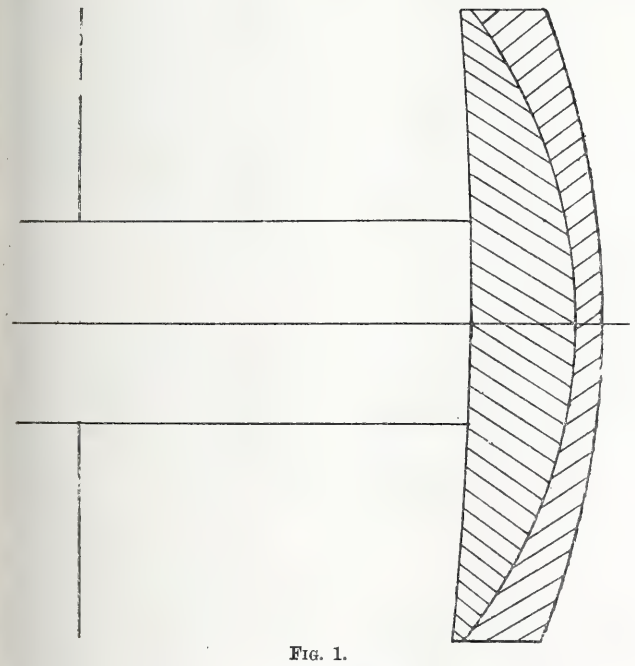


Fig. 1.

HARLES CHEVALIER'S OBJECTIF À VERRES COMBINÉS: NAT. SIZE.

Focal length 333·8 mm. (13·14 in.), rel. aperture 1 : 15·2.

r_1=1450 very slightly convex — b_1=16·5

r_2= 915 convex — d_1=4·25

r_3=6300 very slightly convex — d_2=6·45

r_4=3023 „ „ concave — b_2=37·4

r_5=162·4 — d_3= 4·0

r_6=149·5 — d_4=11·9

L_1=1·5185; L_3=1·6199
L_2=1·6257; L_4=1·5220

I subjoin the diagram (fig. 1) of this objective in accordance with e measurements made in our factory, and may remark that the ack lens could be used alone as a landscape lens with a distance of the op of 52·7 mm. (2·1 in.). It is interesting to note that the photographic colour correction was perfect according to a photograph taken by R. Schüttauf, so that possibly Charles Chevalier has the priority of actual actinic correction in France, although the first publication on this subject is due to P. Lerebours in 1846. (In England A. Ross achromatised his Collen lens as early as 1840.)

As to the spherical correction both the doublet and the landscape lens are under-corrected; it does not very much matter for the latter, in consequence of the comparatively small aperture used in landscape work, but it is a serious fault for the doublet combination, which was also intended for portraits. The largest possible aperture is 1 : 6·2; but considering the amount of the spherical aberration I have my doubts whether so great an aperture has ever been used: the only stop I found in our specimen yielded an aperture of 1 : 15·2. As regards spherical aberration, at any rate, this type cannot even be mentioned in comparison with J. Petzval's portrait combination showing a perfect correction for the huge aperture of 1 : 3·4! Some astigmatism in the oblique pencils is extant, and in consequence thereof the curvature of field is not too great.

In summing up we may assert that Charles Chevalier constructed the first "set" objective fairly rapid and excellently finished; but that it is impossible to compare it with J. Petzval's type as far as correction and aperture are concerned.

II.—Thomas Grubb's Aplanatic.

My appeal in No. 2125, to the readers of this Journal, has had the effect that Mr. A. B. Legard kindly sent me through the friendly mediation of Mr. Thomas Bedding, an aplanatic lens which has been in his possession since the second half of the sixties. He was likewise so obliging as to allow me to grind a plane surface at the edge of the flint lens in order to ascertain the refractive index.

The lens was the more interesting to me as it represented a type of construction — a collective meniscus cemented to a dispersive meniscus — which was to become of such great importance after the year 1866. Although Andrew Ross made use of this form in constructing his old portrait objective of 1840 (the Collen lens), Thomas Grubb seems to have been the first who used it as a landscape lens, at the same time pointing out the advantages this form possessed over the ordinary (French) type as regards spherical correction. He secured a patent in October 1857.

The objective bears the inscription: "C. Grubb's Patent 3345," and we find this repeated on the crown lens where it is engraved by means of a diamond in very small characters. The radii of the carefully finished surfaces were ascertained in the same manner as those of the foregoing objective and the flint index determined with the refractometer was found to be n_D=1·6252. It proved impossible to treat the sharp edge of the crown lens in the same manner without serious injury to the objective. So I was obliged to find another way. I carefully determined the equivalent focal length of the cemented combination for *paraxial* rays by means of Professor Abbe's focometer, and having found it to be 358·5 mm., I endeavoured to find the index of the crown glass which with the given radii and thickness and cemented to a flint of n_D=1·6252, produced such an equivalent focal length for paraxial rays. After some trials it turned out to be n_D=1·5155. These results were in good accordance with the specific gravities which were 2.56 for the crown and 3.68 for the flint lens.

I may as well mention here that before asking Mr. A. B. Legard's permission to interfere with the lenses, I tried to ascertain the refractive indices by carefully determining the equivalent focal length for paraxial rays of each component. These components being single lenses homogeneous light had to be used for observation (I brought natrium into the flame of a Bunsen burner). It is obvious that such determinations must be made very exactly if only the second decimal of the refractive index has to be reliable. I used Professor Abbe's focometer, but although the quality of the images yielded by these single lenses in homogeneous yellow light is remarkably good the result is impaired by the unavoidable fact that in measuring the components (which naturally are of much shorter focal length than the aplanatic itself) comparatively large apertures have to be used. In reducing the results obtained in this way to

paraxial rays some errors creep in, and the consequence is that the anterior equivalent focus shows some difference compared with the posterior, whereas in a lens surrounded by the same medium the values ought to be exactly equal. The figures obtained by me in this way were for the crown 1·516 and 1·520 and for the flint 1·625 and 1.635. The uncertainty for the crown values is apparently much smaller than for the flint, and I could have obtained a more exact value for the flint lens by assuming a crown index and using the artifice mentioned above. But although it would have been possible to discuss the type of construction, Mr. A. B. Legard's kind permission gave a decidedly greater reliability.

In the following diagram (fig. 2) I give every detail of construction and may mention at the same time that the diaphragm could be moved along the axis; this is in perfect accordance with a remark made by Th. Ross thirty-six years ago. The direct pencil shows a certain amount of under-correction, but in a decidedly smaller degree than in the ordinary French landscape lens. So Th. Grubb's

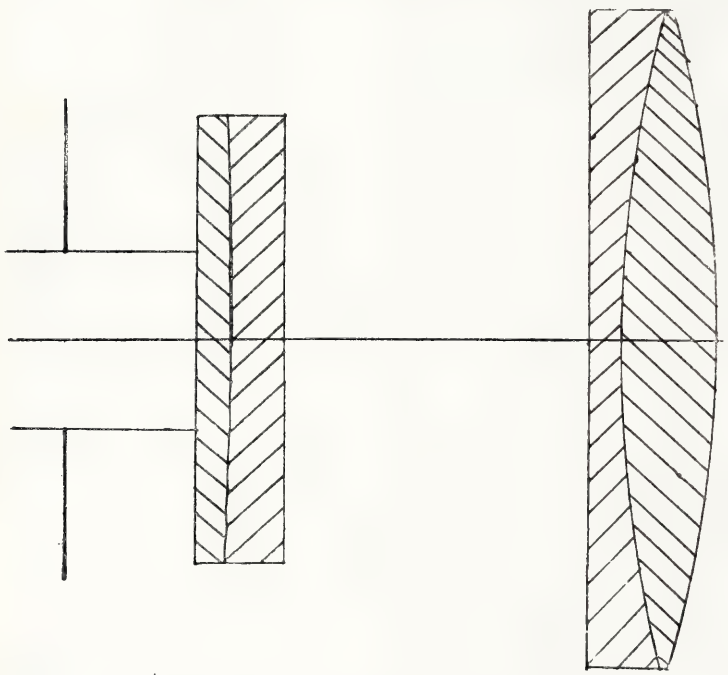


Fig. 2.

THOMAS GRUBB'S APLANATIC LENS: NAT. SIZE.

Focal length 358·5 mm. (14·12 in.), rel. aperture 1 : 14·1

b_1=any value between 36·9 and 61·9

r_1= 450 concave

d_1=13·0

r_2= 65·6

d_2= 3·4

r_3=113·0

L_1=1·5155

L_2=1·625

description of the advantage of his lens over the ordinary type is quite justified. The astigmatism, if the stop is farthest away from the lens, is very nearly of the same amount as in Charles Chevalier's landscape lens, it is not corrected in order to avoid a very marked curvature of field.

As to the meaning of the letter C, I am indebted to Mr. P. Everitt for the communication that it stands for the size of picture for which the lens was intended; it is a way of indicating the focal length of the objective. So it is to be explained that Thomas Grubb himself in one of his papers gives a similar focal length of an aplanatic C—368·5 mm. (14·51 inches) against 358·5 mm. (14·12 inches) in our case.

III.—J. H. Dallmeyer's Portrait Objective.

Although in this instance no old lens has been measured, I think it necessary to make some remarks with regard to this subject. Mr. T. R. Dallmeyer was kind enough to supply me with the refractive indices belonging to the type of construction described in his fath patent, 2507[66]. The correction of this objective was, in consequ of the want of indices, quite unknown to me when I wrote "Theory and History of the Photographic Objective." Comp tions made in 1900 showed a remarkable spherical and astigm correction. Anybody versed in the German language and interes in such details will find an account of J. H. Dallmeyer's and an Petzval objective in the February number of the *Zeitschrift Instrumentenkunde*.* It will suffice for our aim to say that altho J. H. Dallmeyer introduced a totally different back combination, was able to give his objective a splendid spherical correction, wh could be altered at will in order to introduce softness into the pict

However unwilling to obtrude my opinion, I think it only fai J. H. Dallmeyer's memory to state that I was very much and v agreeably impressed by the result of the computation. Having pressed my admiration for Professor H. Zincke's remarkable c struction, I deem it but right and fair to mark my high appreciat of the splendid result obtained by J. H. Dallmeyer, the originator this type.

Coming now to a conclusion, I cannot help expressing the hope t the history of photographic lenses may still profit from the gener help of the readers. There are some points which will remain darkness, unless by chance some old specimen can be examined a measured. From English manufacturers old symmetrical lenses Thomas Davidson of Edinburgh would prove of interest. Fr Continental opticians I should mention in the first instance I. Porr lenses, and in the second place an old Petzval objective made Fr. Voigtländer in the early fifties, and consisting of two co ponents, each of which was formed by three lenses cemented togeth It had an extraordinary aperture—something like 1 : 2—but manufacture has been discontinued long since. Dr. von Rohr.

PATENT-LAW REFORM.

II.

Instead of making a search, after the application for a patent h been drawn up, an inventor should be induced to study what has be done before at the time when he first thinks of a new device, and ever assistance should be given him to make himself thoroughly acquaint with his subject. In most cases he is sure to find anticipations, whi will modify his views, shorten the experiments necessary for develo ing his ideas, or possibly induce him to abandon his intention of filin an application. Making information accessible to the public woul therefore contribute to the desirable result of lessening the number invalid patents.

To a certain extent the other requirements, to give facilities f obtaining licenses and for overcoming obstruction, are not neglect in the existing procedure, but they have not the consideration th deserve, nor is sufficient stress laid on introducing a new manufactur as distinguished from inventing the same.

Some alterations of the law would have to be effected to give the considerations their due weight, and the following suggestions w explain what changes might be introduced. The procedure for o taining patents would remain exactly as it is now according to th English law, so that both the public and the patentee fully under stand that the validity of a patent is not established by the mer fact of its having been granted. In this way the inventor would b saved the immense worry and expense inseparable from a strict ex amination, while the preliminary examination would secure a moderat restriction in the number of applications as it does at present.

For the purpose of further diminishing the number of patents and o preventing patentees delaying the introduction of the patented manu facture, it should not be possible to keep up a patent for more than four years, unless it can be shown to the satisfaction of the examine that the invention, as set out in the claims, has been worked for more than one year on a commercial scale before the fifth year's tax be comes payable. Such a rule would be beneficial in many ways, and among other things, give effect to the opinion expressed by Chief Baron Pollock[16] " . . . a patent, the object of which is not to benefit the world by its communication, but to obstruct by the very general character of its claims, made for conferring peculiar privileges on the patentee; such a patent as that, in my judgment, cannot be supported." If several methods of carrying out the same manufacture are described in one patent, the satisfactory working of one modification should be

* A translation of this article will appear in an early issue of the Journal.—Eds. *B. J. P.*

[16] W. and W., p. 56.

ficient to keep up the whole patent; for it would not be fair to the ventor, either to expect him to work all possible modifications of invention on a commercial scale, or to allow the public the free e of the modifications described in the specification, but not worked the inventor or his licensees.

The examiner should, however, be careful to distinguish between e cases referred to by Chief Baron Pollock in which the claims are o wide, and the cases in which various means are set forth for ob- ning the same result. The procedure would be similar to that of e examination when the patent is first applied for, the examiner porting to the Comptroller, from whom an appeal would be allowed the law officer, whose decision would be final.

With the object of facilitating the introduction of new manufac- res, the system of compulsory licenses should be extended so that ybody who is prepared to carry out an invention or adopt a novel vice, but has been refused a license by the patentee, should be able obtain one from the Patent Office.

This is the second point on which the Committee reports, and they e of opinion[17] that "the machinery as to the actual grant of the ense is needlessly complicated."

They therefore recommend[18] that the jurisdiction be transferred to e High Court, "subject to the same rights of appeal and to the me regulation as to general orders as are in force in respect of its isting business, except that no appeal to the House of Lords shall e brought without the leave of the Court of Appeal or of the House Lords."

Further, "that the respondents in any proceedings under this juris- iction shall include (1) the patentee and (2) any person claiming an terest in the patent as exclusive licensee or otherwise. In addition, e Attorney-General in England or Ireland, or the Lord Advocate in cotland, or any person authorised by them respectively, shall have e right of appearing."

The leading article of "The Times" of the 18th March last observes n this proposal to transfer the granting of compulsory licenses from e Board of Trade to the High Court:—"Is the procedure there all hat parties interested could desire? For a wealthy patentee or a ealthy infringer it is; for anybody else it is not."

As the law at present stands an interested person has to prove to he Board of Trade (1) "that by reason of the default of a patentee o grant licenses on reasonable terms, (a) the patent is not being orked in the United Kingdom, or (b) the reasonable requirements of he public with respect to the invention cannot be supplied, or (c) any erson is prevented from working or using to the best advantage an nvention of which he is possessed." The Board of Trade may then rder the patentee to grant a license.

It will be noticed that the alternatives a and b, which have to be roved by the interested persons, are really incapable of being proved, nd even the third reason is extremely difficult to establish, and in ase the patentee lives abroad the Board of Trade cannot grant a icense at all.

Altogether the Section as it stands, and also the recommendation f the Committee, are drawn to protect the interest of the inventor nd of the patentee respectively, which, as explained above, appears o be the wrong principle to follow.

If, however, the patent legislation is to carry out the original object or which it was established, viz., to facilitate the introduction of new anufactures, the procedure for obtaining compulsory licenses should e made simple and expeditious.

It should be sufficient for the applicant for a compulsory license o show to the satisfaction of the Comptroller:—(a) That he is pre- pared to carry out the invention on a commercial scale; (b) that the patentee has refused him a license on reasonable terms, or has taken o notice of his request. On receiving such an application the Comp- troller would send an official inquiry to patentee at his registered address, asking for an explanation within a reasonable time, say a fortnight, if the registered address be in the United Kingdom.

If the patentee does not answer within the prescribed time, or still persists in refusing a license on reasonable terms to the particular ap- plicant, the Comptroller would be empowered to grant the license asked for, on such conditions as he may deem just, sending a copy of the license to the patentee.

As all licenses have to be filed at the Patent Office, the Comptroller would in most cases be able to ascertain for his guidance in settling the compulsory licenses on what terms licenses to use the patent in question have been granted to other parties by the patentee, and in other cases a royalty of five per cent. on the selling price, or of ten per cent. on the saving effected by the adoption of the invention might be considered fair and reasonable.

All royalties under compulsory licenses should be paid into the Patent Office in the same way as the fees are now paid, and the Patent Office would hand them over to the patentee, less a sum equal to ten per cent. of the gross receipts to cover expenses, if applied for within ten years of the date of payment to the Patent Office. After that time unclaimed royalties would become the property of the Patent Office.

The essence of this suggestion is that the applicant must prove his ability and his willingness to work or make the invention on a com- mercial scale, and this should entitle him to a license on the most favoured nation clause, whether the patentee consents or not.

It is not to be anticipated that many compulsory licenses would have to be granted under such provisions, as inventors would soon realise that it was more to their interest to grant licenses on reason- able terms when asked for by bonâ-fide manufacturers, than to refuse them.

A further rule should be established that any licensee who has been using a patented invention on a commercial scale, for more than one year, should have the right to bring a suit for infringement, as long as he himself continues to work his license.

If the patentee does not carry out the invention himself on a com- mercial scale, he should not be entitled to prosecute for infringement, unless the invention has not yet been worked by any of his licensees, or unless one of his licensees who is carrying on the manufacture on a commercial scale, is made a party to the suit. In no case should an action for infringement be allowed to proceed, where the defendant can prove that the plaintiff knew of the infringement for six months before he commenced the action.

These rules are to prevent men of straw or speculators, who buy up patents, from blackmailing the public, and to enable licensees to protect their interests in cases where they cannot induce the patentee to prosecute third parties for infringement.

On the other hand, it should not be possible to invalidate a patent which has been worked for more than two years on a commercial scale by the patentee or his licensees, except by proving that the invention was in use on a commercial scale for a reasonable time before the first application for the patent was made. It is a matter for discussion whether such prior user ought to have taken place in the country where the patent in question has been granted, or in any country be- longing to the International Union. In the latter case the inventor would have the advantage of the earliest date of application in any one of the countries.

What is a "reasonable time" depends so much on the nature of the invention that it seems preferable to leave its determination entirely to the Court before whom each individual case is tried, and not to attempt to define precisely for what length of time a process should have been worked to become a valid anticipation.

The effect of this provision would be to make a patent almost in- defeasible during the remainder of its term after the invention has been worked or made on a commercial scale for two years. Until that time the patent would fall under the provisions of the present law. It stands to reason that each patentee would use his best efforts to obtain the powerful protection of this provision for his invention: and this would place him in a position to make extortionate demands for the use of his invention were it not for the system of easily obtained compulsory licenses.

It is very essential that "use on a commercial scale" be proved to avoid the failure that has invariably attended the "working" clauses of some patent laws, where it is sufficient to manufacture once every year or once in every two years in the presence of a public notary.

As alluded to in the discussion of M. von Hefner Alteneck's paper, most of the large firms have a special department for watching the progress of their particular branch of industry and for investigating all the complaints about technical deficiencies, which the customers of the firm may make from time to time.

If necessary, this department conducts a series of experiments on the lines indicated by the wishes of customers, and the usual practice is to patent all modifications that may suggest themselves to the trained staff working in the department.

It is also undeniable that the introduction of a modification depends only on its commercial value, so that it may easily happen that a firm, after taking out a patent for a modification, does not find it advan- tageous to adopt the same for its own use, or some unexpected diffi- culties present themselves, which, for the time, make the modification impracticable. Under modern conditions it is quite possible that another firm might discover the same modification, or a very similar one, and succeed in overcoming the difficulties which deterred the first firm from proceeding with the modification.

In such cases, the second patent should not be invalidated by the publication of the first patent, unless the first patent was valid when the second patent was applied for, or unless it can be proved that the second inventor was acquainted with the first patent before he applied for a patent himself. A similar rule should apply to other publications, so that they should not be available as proof of anticipa- tion, when they are more than fifteen years old at the time the patent is applied for.

By the adoption of these rules actions for infringement would be considerably simplified both for the plaintiff and for the defendant, as it would not be necessary as at present to search far back for publica- tions, which might be interpreted as being anticipations: but the

B

[17] Report, Section 22. [18] Report, Section 26.

commercial use of the invention would have to be proved, which is more a question of fact than one of opinion. The questions of ingenuity or of usefulness would not be raised at all in such a suit, so that the difficulty of exactly defining what really constitutes an invention would be altogether eliminated. This view is endorsed by Mr. Abel, who, in discussing what is a patentable invention, says, "that it is the result that one should look to before all else, and that an advantageous result should be held to infer an exercise of ingenuity worthy of being rewarded by a patent."

An ideal state of affairs would be reached if the patent laws of all civilised countries were made identical, on the lines sketched out in this paper, so that a patent taken out in one country could be registered, at the option of the inventor, in all the others, without any further examination of any kind, and in the case of litigation the commercial use in one country would be recognised by all the Courts.

In considering these suggestions the following points should not be lost sight of:—

1. Patents, taken out under the present English law, have as often been upheld in Courts of Law as patents granted after a strict examination in other countries.
2. Inventions are not so much matters of sudden inspiration as the result of patient investigation of what has been done before in the same subject, and of careful experimenting based on a sound knowledge of natural laws, combined with a common sense imagination.
3. Improvements very rarely imply radical alterations in existing methods or apparatus; they generally proceed by small steps, most of which are soon superseded.
4. The real value of an invention can only be ascertained by its practical commercial application; and it is for this that the Crown originally exercised the prerogative of granting monopolies by Letters Patent.

ALEX. SIEMENS.

THE PHOTO-MULTIPLIER.

THE function of this apparatus is to reflect and transmit through the lens of an ordinary camera many images of one object, so that upon the sensitive plate or film a number of photographs may be taken at one exposure and upon one and the same plate.

This reflector is composed of a number of mirrors (silvered on the front surface and burnished) set at an inclined angle to one another. Such a constructed apparatus is placed immediately before the lens of the camera at an angle of about 45°, and in such a position that each mirror or reflector receives incident rays of light emanating from one and the same object. From thence the light passes to the lens, and is thereby transmitted to the sensitive plate or film. This reflector may be made up of a number of separate mirrors laid side by side, and adjusted to the required angle in one framework, or it may be made in one solid piece of glass, crystal, or metal, having a number of plane reflecting surfaces. A reflector so constructed is attached either to the camera front, baseboard, shutter, or lens hood by means of suitable rods or hinges.

The apparatus may be further explained by reference to the accompanying diagrams. At D (fig. 1) is a circular frame, into which

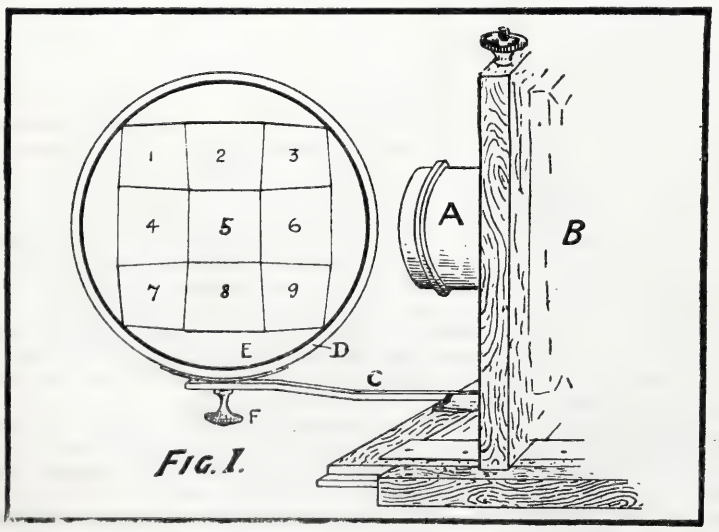


FIG. 1.

is fitted a concave metal disc, E, the curvature, or rather the convexity of this disc, is according to the size the reflected images are required, and also according to the focal value of the lens it is to be used in connexion with. In the present figure, the apparatus is shown with nine reflecting surfaces attached. The manner of retaining the separate reflectors at their proper angles is shown in the sectional diagram, fig. 2. At the back of each of the mirrors, E, F, and G screw is attached, which passes through a hole made in the conc disc, and is then fastened by means of a fly-nut, as shown. Le (fig. 2) be a pin-hole camera, B the reflecting apparatus, and A object to be photographed. Light emanating from the object will

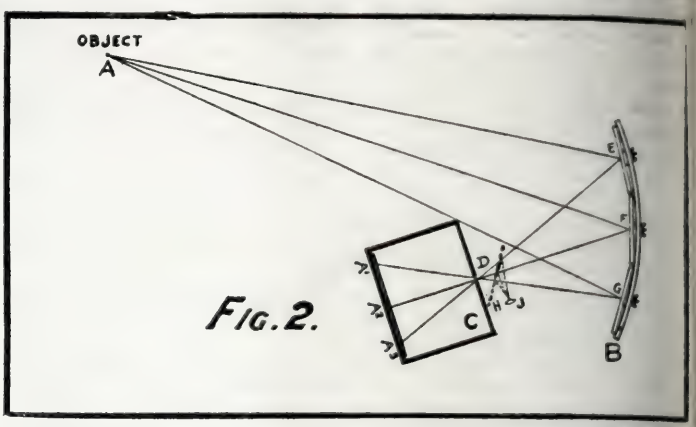


FIG. 2.

received at the three separate points, E F G. From thence they w be reflected through the pin-hole, D, to points on the sensitive pla at A3, A2, and A1, so that three images will be projected upon t plate instead of one. Of course this diagram only shows the later course of the light; it is obvious that the same result would happ with the light passing in a transverse direction.

As the light emanating from the object is reflected before reachi the sensitive plate, a negative, with the image reversed as regar right and left, will be the result. If it is desired to correct this, single plane mirror is placed at H, and the pinhole or lens at J. T multiplier, in a form suitable for use in the studio, is shown in fig.

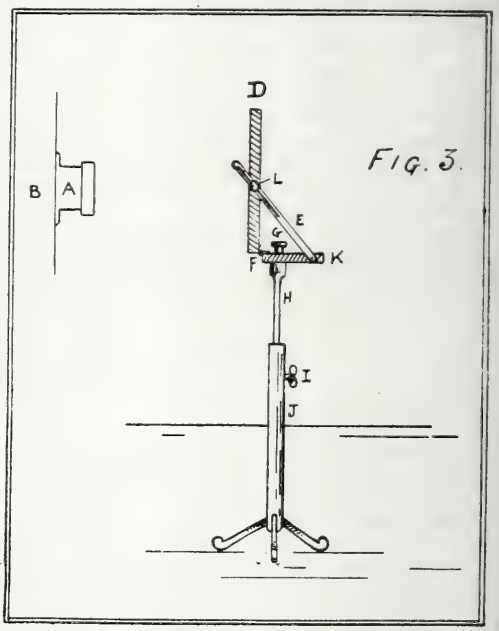


FIG. 3.

From the diagram it will be seen that the telescopic principle is applied to the stand, so that the frame containing the mirrors may be raised or lowered to any level. The frame containing the mirrors is also hinged to the table K at F, and it may be turned on the thumbscrew, G, which is tightened by working in a thread made in the upright H; the thumbscrew, L, working in the stay, E, enables the frame, D, to be adjusted to any desired angle.

THEODORE BROWN.

Our Editorial Table.

THE TECHNICS OF THE HAND CAMERA.

By W. B. COVENTRY, M.Inst.C.E.

London: Sands and Co., 12, Burleigh-street, Strand, W.C.

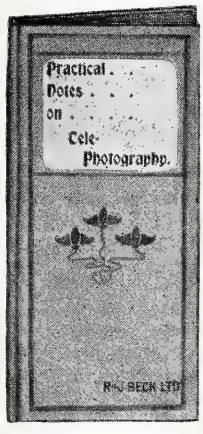
THE author's object in preparing this book is to "supplement the instructions contained in some of the more elementary hand-books of the subject, and to convey in a concise form a sufficiently exact notion of certain principles that are usually dealt with only in separate treatises." Obviously only a limited number of photographers, those in

ct who treat and use the hand camera as an instrument of precision, id not merely as an occasional plaything, are thus appealed to, but is, of course, does not detract from the special utility of the book. r. Coventry treats of the law of conjugate foci, the circle of con-sion, depth of focus, hyperfocal distance, depth of field, moving jects, the lens, exposure, and development. The last chapter con-ins a curiosity in the shape of Beach's developer and its puzzling nstituent, potassium ferrocyanide: quite, we think, a relic of em-ricism. Mr. Coventry is commendably clear in his practical optics id their application to the hand camera, and the really serious worker ill no doubt be glad to have one more aid in rendering photography a atter of exactitude in measurement, which this book undoubtedly is.

Practical Notes on Tele-Photography.

Published by R. and J. Beck, Ltd., 68, Cornhill, E.C.

the forewords to this excellent little book, Messrs. Beck point out at its "pages are not intended to give a full scientific explanation of e laws which underlie the construction of the tele-photo lens. They e published with the hope that they may be of use as a practical ide to the practical photographer, who, without wishing to deeply udy photographic optics, is desirous of being able to use his ap-aratus to better advantage through a knowledge of the general rinciples upon which it is constructed." The book is written through-t with such directness that it can hardly fail to achieve this praise-orthy aim. In a series of brief chapters the principles of construc-on, the properties of the tele-photo lens, a description of the instru-ent and its adjustment, its various applications in practical work, me notes on the use of the instrument, and perspective in photography e dealt with. From the last-named chapter we quote a sentence



ich summarises one advantage of tele-photography which, if nerally appreciated—and we hope it may be in time—should lead to diminished production of photographs having the drawbacks inci-ital to the use of lenses too short in focus. In portraiture especially s kind of distortion is a common defect. "The photographs taken h a tele-photo lens, or a lens of very long focus, will never have ggerated perspective, and will in general give a much more istic picture than those usually produced." To further illustrate simple manner in which tele-photography is expounded in Messrs. ck's book, we extract therefrom the following summary of the hole art" of using a positive photographic lens, in conjunction with egative attachment:—"(1) A tele-photo lens consists of an ordinary otographic lens combined with a tele-photo attachment or special gative lens. (2) It is a long focus lens, requiring only a short nera extension. (3) It possesses an adjustment for altering the us at will, and is consequently a series of different long focus lenses. It gives pictures of an object on a larger scale than an ordinary s, and the amount of magnification is variable. (5) The magnifica-n is directly dependent on the focus, and is ascertained by reference an engraved scale on the mounting. (6) The angle of view included the total field for a given tele-photo lens is always constant, and is out 12°. (7) The equality of illumination is slightly improved by pping down the positive. (8) The depth of focus is slight, but as in ordinary lens, is increased by stopping down the positive. (9) The uisite exposure is calculated by multiplying that required for the sitive alone by the square of the magnification. (10) The aperture rapidity of a tele-photo lens is ascertained by multiplying the aper-re of the positive by the magnification. (11) The tele-photo lens ould not be used at an aperture less than *f*-72, because of the loss definition by diffraction. (12) The positive must have rapidity and uality of illumination giving no distortion and be free from astig-tism and spherical aberration, as the negative element increases all rors present in the positive in proportion to the magnification used."

Messrs. Beck's book, which has given us much pleasure to peruse, should be distinctly helpful in furthering the popularity of tele-photographic work. It is to the credit of the author—presumably, Mr. Conrad Beck—that he pays a well-deserved tribute of recognition to Mr. T. R. Dallmeyer's masterly treatise on "Tele-photography" as a source of reference for the scientific aspects of the subject.

A Portable Enlarger.

Manufactured and sold by W. Watson & Sons, 313, High Holborn, W.C.

In the enlarging system shown by the appended illustrations, Messrs. Watson have combined simplicity with portability. The body of the instrument is made of mahogany, and the central extension portion takes the form of a camera bellows. By one or two easily controlled movements the enlarger, when not required for use, may be made to



collapse, and it is then packed up within itself as shown in the second illustration. The quarter-plate and five by four sizes admit of the negative (glass or film) being enlarged up to 8½ by 6½ and 10 by 8, and the half-plate up to 12 by 10. A lens is supplied with the instrument, or the photographer's own lens can be adapted and focussed. For daylight work, to a moderate degree of amplification, this portable enlarger, which has been submitted to our inspection, should meet the needs of a very large body of amateur photographers. Messrs.



Watson, by the way, issue the following invitation to those interested:—"If, before purchasing, you would like to see a specimen made with one of these enlargers, send us one of your negatives (of course, possessing a fair amount of contrast and good definition), together with P. O. 1s. to cover bare cost and postage, and we will make and send you enlargement, reserving for you the enlarger used for the purpose."

Studio Gossip.

An Old, Old Story.—Supplementing the telegram from Geneva printed in the "Daily Express, and which we reproduced last week, we take the following from Monday's "Daily Mail." It is headed "A Notable Discovery."—"The colour-photography recently invented by M. Gurtner was tested yesterday in Berne. No one could discover the secret process, but all the leading photographers present were unanimous in agreeing that the discovery would revolutionise photography. All the colours showed distinctly both on paper and glass, but brown, yellow, and red were the most successful."

A Warning.—Mr. C. T. Belbin, of 75, Abbey Foregate, Shrewsbury, writes: "Will you kindly caution photographers, especially in the Wolverhampton and Birmingham district, against a canvasser travelling the country, presenting himself as having been for five years in the employ of Eddison, of Bradford, and other north-country towns. The man is soliciting work as a photographic canvasser, is about forty years of age, about five feet nine or ten inches in height, stout build, clean-shaven, ruddy bloated complexion, respectably dressed, dark mixture suit; has, from his conversation had a good experience of canvassing. This man called on me about three weeks ago, soliciting work. I gave him two enlargements, one framed, the other unframed, and a case of cabinet photographs (enamels) to canvass with. I find he has sold one specimen for 19s., gone off with that, also specimens, and likewise other moneys, in addition to which he quite forgot to pay for his lodgings before leaving. If he should call on any photographers they will know how to deal with him, and I shall be glad if they will kindly communicate with me."

Peculiarities of American Patent Law.—In the course of the discussion following the reading of the paper, by Mr. Alex. Siemens, on

"Patent Law Reform," Prof. Ayrton, F.R.S., said that, in his opinion, the American system of interference was a very disadvantageous arrangement. If a patent was taken out, the patentee was called upon to defend it—not because he was claiming any royalty, but simply because, unless he did so, as somebody else had lodged an interference, he would lose it altogether. He was thoroughly in accord with Mr. Imray, that the examination of patents in Germany and the States was very unsatisfactory and of comparatively little use. Not very long ago an objection was raised to a patent of his own for a transparent varnish, which, unlike ordinary transparent varnishes, was conductive, on the ground that he had not given a drawing. He pointed out to the American Patent Office that it was impossible to draw a varnish; but they said they must have a diagram. Eventually he drew three vertical lines, which he said represented a coating of varnish on a plate of glass, and got his patent.

THE Picture Season.—With May comes the picture season. On Monday last the Royal Academy opened its doors to the public, and the Monday before the Guildhall loan collection of paintings was formally opened by the Lord Mayor. The advertisements in the daily press will show the plethora of other exhibitions now open. The Royal Academy show this season is pronounced to be about the average, and nothing more. The picture that will probably receive the greatest amount of attention from the general public is M. Benjamin Constant's portrait of the late Queen which was shown in Paris last spring. Next to that will, of course, be the President, Sir Edward Poynter's, "Hermia and Helena." The President's picture always receives great attention, and, at the same time, is subject to, perhaps, the strongest criticism of any in the show. The exhibition in the Art Gallery at the Guildhall is this year confined entirely to the works of Spanish artists, and a very fine collection indeed has been got together. It includes several fine pictures by Velasquez, Murillo, Fortuny, Goya, and other Spanish artists. We should recommend all our readers who can to embrace the opportunity of seeing this exhibition, as they may never have another chance as the pictures are all loaned from private galleries to which they will be returned when the show closes. It will remain open daily till the end of July, including Sunday afternoons from 3 to 6 o'clock, and the admission is free as the City Corporation do not believe in "gate money." While referring to picture galleries and exhibitions one is rather inclined to speculate as to whether photographers, as a body, profit as much from them as they might? Some do, we know, and their pictures prove it. But the majority of the middle class of photographers seldom visit art galleries and art exhibitions.

WEATHER Control.—Ever since "weather shooting," as it is called in Germany and Switzerland, met with such pronounced success in Styria, Upper Italy, Hungary, and France, meteorologists have been engaged in a very wordy battle as to the merits of the scheme. That something had been accomplished cannot be denied, writes "The Scientific American." Indeed, so successful have been the efforts in preventing hailstorms in Upper Italy that since the experiments of 1898 some twenty thousand stations have been established. At the Agricultural Congress held in Padua last November, by far the greater number of the members were in favour of the building of "weather shooting" stations. The congress was very decidedly impressed by an account of one of last summer's hailstorms in the vicinity of Vicenza. So violent was this particular storm, the story runs, that for miles the land was completely devastated. But in this ravaged section, one spot was spared, because there it is asserted a number of stations had been located which had warded off the danger. The shooting apparatus hitherto used has been very primitive in construction. For a cannon, a mortar with a funnel-like barrel was often used. In some places the funnel is fixed vertically in masonry. This method of mounting the cannon is not only crude, but also dangerous, for often enough serious accidents have occurred. In order to avoid these dangers as well as to improve the apparatus in general a Hungarian editor named Kanitz has devised a simple form of cannon which is essentially a breech-loading mortar some thirty feet in length. The mortar is journalled in a rotatable carriage, so that it can be raised and lowered and swung from side to side. The charge is a metallic cartridge of blasting powder. After the discharge a loud, shrill whistling is heard, lasting for about fourteen or fifteen seconds. French and Italian wine-growers insist that by means of the gun clouds are torn asunder, so that rain instead of hail falls. The grape growers of five departments of the French Alps have formed an alliance for buying cannon and powder for next summer. The Italian government has such faith in weather-shooting that it supplies wine-growers with powder at the rate of three cents a pound.

News and Notes.

THE Royal Photographic Society will be pleased to allow all interested in pictorial photography to view the exhibition of Monsieur Robert Demachy's work now on the walls at 66, Russell-square. Admission will be granted daily, on presentation of visiting card, from 10 to 4, and on Wednesdays from 10 to 8.

THE Royal Photographic Society's Forty-sixth Annual Exhibition will be held from 30th September to the 2nd November next, at the New Gallery, 121, Regent-street, London, W. The judges are Messrs. P. H. Emerson, B.A., M.B., Colonel J. Gale, G. A. Storey, A.R.A., F. M. Sutcliffe, J. B. B. Wellington, Chapman Jones, F.I.C., F.C.S. E. J. Wall, Maj-General J. Waterhouse, I.S.C. The selecting and hanging committees consist of Messrs. P. H. Emerson, B.A., M.B., Charles Jo A. Mackie, J. C. S. Mummery, W. Thomas, J. B. B. Wellington, Thom Bolas, F.I.C., F.C.S., F. A. Bridge, Chapman Jones, F.I.C., F.C.S E. Sanger Shepherd, E. J. Wall, Maj.-General Waterhouse, I.S.C. T exhibition will be divided into five sections:—I. Selected pictorial ph tographs; II. General professional work; III. Photographic apparat and material; IV. Photo-mechanical processes of reproduction; Scientific photography and photography in its technical applications.

SPRING Photography.—Spring is with us in earnest now, and tho who wish to secure pictures of spring should lose no time in obtainin them for, if the present warm weather continues, the trees will soon assum their summer garb and spring effects will be past for another yea When the foliage is young many pictures may be obtained that at othe times are impossible, such as certain old ruins, buildings, and the lik that are partly obscured by trees. If they are taken when the tre are leafless the picture has a wintry and cheerless aspect, and if take when the foliage is at its full there is little of the main subject of th picture to be seen. If, however, the photograph be secured while th foliage is young, a good picture is the result. Again, shaded glens, &c make good pictures while the leaves on the trees and shrubs are young and delicate in tint, but the case is different when the foliage is at it full, and dark in colour. Just now fruit trees and orchards are, o shortly will be, in full blossom, but one seldom sees really good photo graphs of these subjects, though they are favourite ones with painter The chief fault with most of the photographs we have seen of fruit tree in full bloom arises from halation, which quite spoils the effect, ren dering the blossom more like snow than anything else. Those wh wish to secure good pictures of such subjects as these should take th precaution of backing their plates, in the first instance, so as to avoi halation.

Commercial & Legal Intelligence

THE "Barnet Photographic Record" for May (published by Elliot and Sons, Ltd., of Barnet), contains some reproductions of snap-shots b the late W. J. Warren, whose loss to photography is still felt.

WE have received the April list of the well-known manufacturin chemist, E. Merck, of Darmstadt, and 16, Jewry-street, E.C. Promin ent mention is given to Merck's pyrogallic acid, for the use of whic formulæ will be found in the list.

THE Imperial Dry Plate Company, of Cricklewood, are issuing a ver attractive show-card for their P. O. P. It is printed in colours, an shows two winsome young ladies engaged in looking after a batch o printing frames. The show-card is bound to arrest attention: it i bright, striking, and novel.

ADAMSON'S Lights.—Messrs. Adamson Bros., late of 22, Christophe street, London, E.C., ask us to announce that they have appointe Messrs. W. M. Still and Co., of 24, Charles-street, Hatton-garde London, E.C., to be the sole manufacturers of their systems of "Electric and "Gas" lights for photography. All communications should, there fore, be addressed to that firm. The department will be directly unde the supervision of Mr. A. G. Adamson.

LIZARS' New Catalogue.—The new catalogue of Mr. Lizars, of Glasgow occupies about 200 pages. It is one of the completest issued, an synopsises everything that the modern amateur or professional photo grapher is likely to require in the practice of his hobby or busines There are many excellent half-tone illustrations in the catalogue mad from photographs taken in the Challenge cameras by well-known worke The catalogue, which is sent free on application, contains about thir pages of instruction for beginners, formulæ and practical hints.

MESSRS. Ross, Limited, of 111, New Bond-street, W., are issuing a abridged catalogue for 1901, of their optical productions. The fronti piece is a beautifully printed half-tone portrait. The negative was take by Mr. Fellows Wilson, who is rapidly acquiring a high reputatio for his very graceful and refined portrait studies, with a Ross-Zeis anastigmatic lens. The following extract from Messrs. Ross' catalogu may be of interest:—"The Zeiss patent anastigmatic lenses are manu factured (under licence) by Ross, Ltd., at their optical works, Clapham common, exactly to formulæ supplied by Carl Zeiss; and the optica glasses and methods of construction are precisely similar to those em ployed at Jena, the only difference between the respective lenses bein that the Zeiss anastigmats made by Ross, Ltd., are mounted in th English style, and furnished with the standard apertures of the Roya Photographic Society."

COPYRIGHT in a War Photograph.—In the case of Nicholls v. Parke and another tried before Mr. Justice Wright on Tuesday last, th plaintiff, Mr. Horace Walter Nicholls, photographer, formerly o Johannesburg, sued the proprietors of the "Golden Penny" to recove penalties for the alleged infringement of his copyright of a photograph Mr. Foote, K.C., for the plaintiff, said that at the outbreak of the wa his client took various photographs for the purpose of selling them fo reproduction, including the one in question, which represented officer purchasing shells as curios from Kaffir women. His case was that fo payment of a guinea he gave the defendants a license to reproduce th photograph in the "Graphic," and that as they had also reproduced i in the "Golden Penny" he was entitled to recover a coin of the realm in respect to each copy published. Mr. Justice Wright gave judgment fo the plaintiff for penalties amounting to £89 11s. 8d., being a farthing fo each copy of the journal printed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
.....	Birmingham Photo. Society ...	*Elementary Chemistry for Photographers.* C. F. Townsend.
.....	Borough Polytechnic	Monthly Print Competition.
.....	G.E.R. Mechanics Institution...	Slides in Members' Competition.
.....	Redhill and District	Discussion: *Composition.* Opened by J. O. Grant.
.....	Woodford	*Some Phases of Development.* H. T. Malby, F.R.P.S.
.....	Camera Club	*Some Yorkshire Caves and Waterfalls.* T. C. Hepworth.
.....	Croydon Microscopical Society	Excursion: Croham Hurst.
.....	London and Provincial	*The Action of Restrainers.* E. J. Wall.
.....	Oldham	Demonstration: *Negative Development.* R. T. Taylor.
.....	Ashton-under-Lyne.....	Excursion: Broadbottom, *viâ* Gee Cross. Leader, Samuel Woolley.
.....	Borough Polytechnic	Excursion: Shirley. Leader, H. A Norman.
.....	Hull	Excursion: Burton Bushes.
.....	Liverpool Amateur	Excursion: Speke Hall. Leader, Dr. J. W. Ellis.
.....	Walthamstow Photo.	Excursion: Merchant Taylors' Hall.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 2,—Mr. F. C. Kellow in the chair.

Mr. Philip Everitt showed a tele-photo attachment, by Steinheil and ons, of Munich, made in aluman (an alloy of zinc and aluminium) nd magnalium (an alloy of magnesium and aluminium), the latter eing employed in the screws and parts that are subject to wear. It onsists of a single lens giving rectilinear images if the extension of ie camera is equal to or exceeds the positive element or positive lens sed with it. It magnifies up to ten times, and the specimen (a portrait) hown was rather over four times with very fine definition.

Mr. W. E. Bond referred to a criticism of the work of the Cooke exten- on lenses in respect of definition, made at a recent meeting. He did ot find himself in agreement with the remarks then made, and was uite satisfied with the performance of the lenses. He handed round me examples of portraiture taken with the 8.5 lens extended to about 2.5 inches which, while not intended as tests of definition, would show hat the lens was capable of doing. The subject was "Miss Minnie erry," and the negatives were made in Mr. Furley Lewis's studio, by hom the lighting was arranged. The pose was by Mr. Bond. The rints were by the carbon process. Special attention was directed to ne of the prints. It was developed on glass and finally backed up ith paper, the image being seen through the glass, and, therefore, in s proper position with regard to right and left.

Mr. W. Thomas passed round a print by the late Mr. W. J. Warren, f Leeds, as a good example of amateur portrait work in an ordinary om. The subject was Mr. Warren's little daughter, and the print a arbon.

Mr. J. E. Hodd showed several film negatives and prints made by his rother, Mr. R. A. Hodd, with the No. 4 Panoram Kodak on the occasion the recent football match at the Crystal Palace. The films were de- eloped with adurol, a developer Mr. Hodd considered an excellent one r films. The photographs were generally admired by those present. Ir. Hodd also passed round some chloride prints which were supposed have received the usual care in making, but which had altered in ne since being sent out, and that within twelve months. The original ne was visible in parts, but here and there the other parts had grown older, as if the toning action had continued. Separate toning and fix- ig baths had been used.

Mr. A. Haddon asked if it had been determined that the glazed water- roof backing-paper applied to the prints had or had not anything to o with the matter?

Mr. Hodd replied that the paper was supplied especially for the purpose question, and was used by thousands of photographers who desired to etain upon the prints the high gloss secured by squeegeeing upon ferro- ype sheets or glass. If it were in his power he intended to compare me prints not mounted in this way.

No further suggestions were offered.

Mr. Thomas passed round several negatives on films made with the Al- ista panoram camera. One especially he drew attention to. There as no image upon the film, but throughout its length, at almost re- ular intervals occurred circular patches of deposit, of about the size of shilling. A lengthy period was devoted to elucidating the problem, ut Mr. Thomas explained the inapplicability of most of the suggested xplanations, and amongst them those of a pin-hole in the camera, the ens being open whilst the film was being changed, &c. At the end of he meeting the matter stood where it was.

PHOTOGRAPHIC CLUB.

May 1, 1901,—Mr. W. R. Stretton in the chair.

Mr. W. Thomas showed several film negatives recently made by means f the Al-vista panoramic camera. With one exception the negatives ere good, but the exception bore no image as it should have done. n its place was a series of clearly defined circular marks, somewhat trong in density, covering the whole length of the film, and of about the diameter of a halfpenny. This particular piece of film was the central portion of a length, both ends of which gave good negatives. Mr. Thomas was at a loss to explain the phenomenon, if such it may be termed. He showed that it could not be due to the lens being left open because, when at rest, it lay at right angles to the view, and any light that might by chance traverse it would fall quite clear of the film if it ever reached the interior of the camera. For this reason he could not accept the suggestion that the multiplication of the discs or patches was caused by light falling in a particular place whilst the film was wound across. The existence of a pin-hole in the camera was suggested as a probable cause, but there was no direct evidence to support any of the suggestions made, and the thing remains enshrouded in mystery.

Bath Photographic Society.—At the last meeting the Hon. Secretary read a paper entitled "Treatment of films in the production of negatives." Beginning with Fox-Talbot's Photogenic Drawing (1839) as a principle, he sketched each important modification and improvement in flexible sensitive photographic surfaces, and appliances for their use, up to the present day, giving dates of introduction and other details. A number of fine negatives made by Mr. Wellington on his new negative films were passed round for inspection, also finished prints from these negatives in various styles of printing paper issued by that firm. The room was then darkened and a quantity of exposed Wellington films, Thornton paperoid, and glassoline films developed, &c., all working details being given from start to finish. The resulting negatives were passed round by the demonstrator, who replied to questions put. Mr. G. F. Powell showed prints taken from Thornton paperoid film negatives, which were equal to his usual excellent work. Miss Bruere and Mr. A. T. Davies (Keynsham) also presented examples of film negatives of the same brand.

Hove Camera Club.—At the annual general meeting a most satisfactory report and balance-sheet were presented. The Club is unfortunate in losing the services (through pressure of business) of the Hon. Secretary, Mr. C. Berrington Stoner, who has worked hard in its interests for the past three years. His place is taken by Mr. A. R. Sargeant, 55, The Drive, Hove, with Mr. R. C. Foskett, 26, Adelaide-crescent, Hove, as Assistant Hon. Secretary and Treasurer. Alderman J. Colman, J.P. (the Mayor of Hove), has been elected President for the year. At the conclusion of the business Mr. Douglas English, who is a member of the Club, gave a very interesting and instructive "Natural History" lecture to a large number of members and friends present; and slides thrown on the screen were of that very high quality which has become associated with this gentleman's name.

Southsea Photographic Society.—At the last meeting of the Society Mr. Louis J. Steele gave a lecture, entitled "The Beauties of the Higher Alps," illustrated with nearly two hundred lantern slides, forming a beautiful series of views taken by himself during several mountaineering tours in the highest and most dangerous parts of the Swiss and Italian Alps. The beautiful atmospheric effects were rendered perfectly by the pictures thrown on the screen and each was a perfect pictorial photograph, reflecting the greatest credit on Mr. Steele as a skilful user of the camera under difficulties. His cloud studies and views of glaciers, mountain peaks, and sunsets taken at the highest altitudes were marvellous examples of photography, and called forth rounds of applause from those present. The lecture was followed with the closest attention and interest by the large audience, and, in conclusion, Mr. Steele referred to the great advantages which modern photography placed in the hands of visitors and tourists in foreign lands, and urged those present to take up this interesting and delightful hobby if they had not already done so, so that their excursions would become a source of pleasure to themselves and friends afterwards. He could suggest no better way of forwarding the cause of photography than by mutual intercourse with other photographers, and by joining the ranks of Southsea Photographic Society.

Patent News.

THE following applications for Patents were made between April 22 and April 27, 1901:—

X-RAY APPARATUS.—No. 8227. "An Improved Apparatus for Localising, with the Aid of the Roentgen Rays and Fluorescent Screen, Metallic Objects in the Human Body or other Bodies." JOHN PHILLIP BENNETT.

SHUTTERS.—No. 8248. "Improvements in Photographic Shutters." GAËTAN JOSEPH FORTUNÉ MARIE MATTIOLI.

PRINTING FRAMES.—No. 8297. "Improvements in Photographic Printing Frames." WILLIAM ALEXANDER.

CAMERAS.—No. 8300. "Improvements relating to Photographic Cameras." HENRY SIMPSON.

SHUTTERS.—No. 8351. "Improvements in or relating to Photographic Shutters." (Bausch & Lomb Optical Company, United States.) Complete specification. ALFRED JULIUS BOULT.

SHUTTERS.—No. 8353. "Improvements in or relating to Photographic Shutters." (Bausch & Lomb Optical Company, United States.) Complete specification. ALFRED JULIUS BOULT.

SHUTTERS.—No. 8356. "Improvements in or relating to Photographic Shutters." (Bausch & Lomb Optical Company, United States.) Complete specification. ALFRED JULIUS BOULT.

SHUTTERS. — No. 8358. "Improvements in or relating to Photographic Shutters." (Bausch & Lomb Optical Company, United States.) Complete specification. ALFRED JULIUS BOULT.

SHUTTERS. — No. 8360. "Improvements in or relating to Photographic Shutters." (Bausch & Lomb Optical Company, United States.) Complete specification. ALFRED JULIUS BOULT.

VIGNETTERS.—No. 8573. "Improved Shapes or Masks for producing Photographic Vignettes." WILLIAM TYLAR.

PHOTOGRAPHIC PLATES.—No. 8623. "Improvements in packing Photographic Plates, and Apparatus therefor." Complete specification. KARL MICHAELIS.

COPYING DRAWINGS.—No. 8645. "A New and Improved Process for reproducing Printed Copies of Drawings or the like from Photographic Copies of the same." Complete specification. ADOLF TELLKAMPF.

PLATE AND PRINT WASHER.—No. 8681. "Improved Photographic Plate and Print Washer combined." THOMAS COSGRAVE.

MAGAZINE CAMERA.—No. 8685. "An Improved Daylight Loading Magazine Camera and Changing Box." ALEC JAMES JONES.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

GLASGOW INTERNATIONAL EXHIBITION.

To the EDITORS.

GENTLEMEN,—Perhaps it would be interesting to your readers who intend visiting the Exhibition to know that they can have the use of a dark room at our stall in Grand Avenue. — We are, yours, &c., RAE BROS.

134, St. Vincent-street, Glasgow, May 4, 1901.

To the EDITORS.

GENTLEMEN,—In your reviewer's account of the photographic section of the Glasgow International Exhibition, I am represented as having claimed, in the course of my remarks to the press representatives, that the collection was undoubtedly the finest ever brought together.

As the person chiefly responsible for bringing the collection together, it would have been most presumptuous on my part to make such an assertion however much I might be pleased with the result of my efforts, and I certainly did not do so. I address you specially, however, to correct a most curious error your reviewer has made in stating that "it was found impracticable to hang the work of various foreign exhibitors in classes by themselves."

As a matter of fact this is exactly what has been done, and constitutes one of the most interesting, and, so far as I know, quite a unique feature of the exhibition.

As a general rule, the result has been as the Committee anticipated, viz., that the visitor is at once struck by the very pronounced individual character of the work contributed by each country.—I am, yours, &c., J. CRAIG ANNAN.

230 and 234, Sauchiehall-street, Glasgow, May 5, 1901.

PHOTOGRAPHY AND THE FOURTH COMMANDMENT.

To the EDITORS.

GENTLEMEN,—It would be interesting to get your correspondent's definition of "imperative work." The Commandment which he professes to believe applies to Sunday, is very explicit, and admits of no exceptions. Consequently if he permits his maidservant to cook his dinner or wash his tea things on Sunday he might as well attend to his business and sell his goods, as far as the Commandment is concerned. I suppose he conforms to the general usage of modern Sabbatarians, and draws the line just where it suits his convenience.

I do not say or suggest that there is anything ludicrous in sin, but there are sins enough existing without adding an imaginary one to the number. He follows the usual course of those "who profess and call *themselves* Christians" by branding as "atheists and nominal Christians, &c., &c., &c.," those who do not accept his theological notions.

Mr. Hull writes fairly on the subject, but I must take exception to his opening sentence, in which he represents me as arguing for Sunday labour. If he looks at my opening communication he will see that I am opposed to it, possibly as much as he is, but for a different reason. I do not admit that it is sinful, for "where no law is there is no transgression," but as I assert my right to a day of rest, I claim the same right for my neighbour, on the principle of "doing to others as I would they should do to me."

I certainly do not exclude the teaching of the New Testament, but it does not deal with the Sabbath question except in a negative wa The very fact of the Early Church deliberately selecting a differe day from the Sabbath for their assemblies is very suggestive. Chri was a Jew, and therefore kept the Sabbath, but His mode of observan frequently brought on Him the charge of Sabbath-breaking from t Pharisees of His day, and neither He nor any of His Apostles enjoin Sabbath-keeping on Gentile Christians, or suggested that the oblig tions of the Jewish Sabbath should be transferred to Sunday.

In the controversy recorded in Acts xv., where certain Christia maintained the necessity of Circumcision and observance of the law Moses, after much disputing the decision arrived at, prefaced by t statement, "It seemed good to the Holy Ghost and to us to lay up you no greater burden than these necessary things," is contained verse 28, and makes no reference directly or indirectly to the obser ance of the Sabbath.

Modern Sabbatarianism is an inheritance from the Puritans, and t attempt to confuse the Sabbath with Sunday cannot, I believe, b traced further back than the fourth century, the first promulgated la on the subject being the Edict of Constantine, about 320 A.D.

Thanking you for your courtesy in facilitating a discussion on matter somewhat outside your usual line, and hoping that it may lea some of your readers to examine the question for themselves, an thus to arrive at sounder views of a much-misunderstood subject.— am, yours, &c., J. H. W.

May 5, 1901.

To the EDITORS.

GENTLEMEN,—I should like to correct a bad error which I made i my last letter. The Greek word "to fulfil" is πληρῶσαι; not καταλῦσ ("to destroy.")

When I looked up the verses quoted last week I was struck by th difference in the two words used, "to destroy" and "break." Th first, a strong word, which He uses when He refers to His connexio with the law; the second, "break," a much weaker word, used whe advising His disciples. I should like to draw attention to Luke xxii last verse: "And they returned and prepared spices and ointments and on the Sabbath they rested, according to the Commandment. Here we have the first followers of Christ carrying out His commands Note the words, "according to the Commandment." What Command ment? Why, the Fourth Commandment, which, among others, Chris enjoined His followers to keep in Matthew v. 17. If the passage quoted are not sufficient authority, and no mortal can surely wish fo more, then there is no authority in earth or heaven that will convinc a man against his will.—I am, yours, &c., H. EDMONDS HULL.

To the EDITORS.

GENTLEMEN,—Your correspondent, "J. H. W.," states that no obliga tion exists for Christians to keep Sunday a day of rest. Of course he means that in the Bible there is no sentence expressly stating tha Sunday is to be a day of rest in the new Christian era.

Now, a Christian is a follower of Christ, who said: "I do alway those things that please Him" (God), and as the day of rest is th oldest Commandment in existence (with a reminder inserted in the Ten Commandments) we should follow Christ, and do the things that pleas God. True followers of Christ delight to keep God's laws, becaus they indicate His will and wish, and as such are entitled to the greates respect. All honour then to those who seek to do God's will, an refuse to work on Sunday.

To show again the false position "J. H. W." takes up. If th Commandment against murder were to be treated in the same way, an he "was under no obligation" to keep it, would he not quickly fin the police were on his track? Why then treat the senior Commandmen with less respect? At the Judgment Day men will be judged by the Ten Commandments and the spirit in which they have kept them.— I am, yours, &c., EXCELSIOR.

To the EDITORS.

GENTLEMEN,—As there is at the present day a great tendency to desecrate the Fourth Commandment, it is good to find that there are some ready to uphold the Sabbath not only as a day of rest, but as a Holy Day set apart to worship God—for the Lord is a jealous God, and will be worshipped. The Israelites were told to keep the Sabbath and reverence God's sanctuary, and if they did not hearken to Him and obey they would be punished seven times more for their sins (Lev. xxvi. verses 2 and 18).

Nehemiah, warning the people says: "Yet ye bring more wrath upon Israel by profaning the Sabbath" (Neh. xiii. verses 15-18). He realised that profaning the Sabbath was a solemn matter, and truly it is.

Was not Jeremiah also sent to renew the covenant in hallowing the Sabbath? Thus saith the Lord: "Take heed to yourselves and bear no burden on the Sabbath Day . . . neither do ye any work, but hallow ye the Sabbath Day" (Jer. xvii. verses 21 and 22); also pre-

ding verses (10 and 11) speak of God giving to every man "according his ways and according to the fruits of his doings . . . . so that that getteth riches, and not by right, shall leave them in the midst his days, and at his end shall be a fool"—working on the Sabbath. not that getting money not by right when Scripture tells us to keep holy? Would that there were more that looked upon the Sabbath a day set apart for the true worship of God. It is painful to read ider News and Notes of this last week's BRITISH JOURNAL OF PHOTO-RAPHY an extract from the "Rothesay Express" entitled "Photo-aphic Enterprise." That it was a smart piece of work no ie would deny, but is that keeping holy the Sabbath ay? One knows full well that it is not possible to revent persons abusing the Fourth Commandment, but e should discourage it as much as possible. Doubtless some will say iese things refer to the Jews. But were not the Jews a typical eople? That the above may convince some that it is wrong not to eep this law is the earnest wish of D. K. W.

Wimbledon, S.W.

A LENS ACCIDENT.

To the EDITORS.

GENTLEMEN,—You might be interested to hear of an accident I had hen taking a photo of the reception of the Volunteers from South frica at the Town Hall, Derby, on April 29. I was on the top of me premises sixty feet high, and in reversing my camera to take an pright picture the lens fell out and tumbled on to the pavement sixty et below. Strange to say, it was quite uninjured when picked up eyond having the flange bent. It was a Dallmeyer stigmatic lens, $\frac{1}{4}\times 6\frac{1}{2}$, so, of course, was rather expensive if it had been smashed. It as a most extraordinary thing it did not get broken.—I am, yours, c., HOWARD BARRETT.

The Studio, Spondon, Derby.

M. DEMACHY'S EXHIBITION AT RUSSELL-SQUARE.

To the EDITORS.

GENTLEMEN,—Will you kindly thank the author of the article in he last number of THE BRITISH JOURNAL OF PHOTOGRAPHY on my xhibition at the Royal for the very flattering and indulgent way in hich he has spoken of my works? I am more than repaid for the rouble these prints have given me by the knowledge that they have nterested the London photographers.—I am, yours, &c.,

ROBERT DEMACHY.

Photo-Club de Paris, 44 rue des Mathurins, Paris.

IN BORROWED PLUMES.

To the EDITORS.

GENTLEMEN,—What is your opinion of a professional photographer sing the words "Gold Medallist" on his photographic mounts and tationery, leading his patrons to believe it was gained by photo-raphic merit, when in reality it was obtained by his son for merit in mateur pugilism?—I am, yours, &c., DISGUSTED.

[We strongly condemn such equivocations as that referred to by our orrespondent. It is to be hoped that when the newly formed Professional hotographers' Association gets into working order it will exert its nfluence to prevent the public being deceived in this manner. We ave unfortunately met many instances of claims to awards of medals, oyal patronage, and other distinctions, of which, if challenged, the hotographers could not prove the possession or the receipt.—EDS. *B.J.P.*]

THE POISONS ACT.

To the EDITORS.

GENTLEMEN,—I should like, if I may, to ask "Fair Trade" how he as come to the conclusion that I am unable to take up an issue with Mr. Dobbs? I am not aware that that gentleman has challenged me o tread on the tail of his coat. The only letter I have seen from Mr. Dobbs is one in your issue of April 19, in answer to the letter of Chemist," in a previous issue, a letter of quite a different type from hose of "Fair Trade," as Mr. Dobbs appears to have some idea of vhat he is writing about.

I presume by "Pharmaceutical Association," "Fair Trade" means he Pharmaceutical Society. No Pharmaceutical Association "sets examinations."

It is comforting to find "Fair Trade" thinks that dispensing should e restricted to thoroughly qualified persons (another monopoly). Unfortunately it is not so restricted in this country. Any one may dispense medicines, and if they do not contain scheduled poisons any one may sell them.

As "Fair Trade's" "simple examination in poisons" is to consist of one question only:—"Does this article require the purchaser's signature or merely a poison label?" it will be simple indeed. None of your readers, intelligent or otherwise, could possibly mistake it for any other examination.

If no more convincing arguments on behalf of this new Bill are forthcoming than have already appeared, I shall rest happily. It will certainly suffer more from its friends that its enemies.

In last week's JOURNAL poisoning cases of the year 1899 were detailed. The unfortunates number a very small fraction of our large population, but this is unimportant. The question appears to be whether the percentage has increased or decreased during the life of the Pharmacy Acts. Carbolic poisonings have decreased since its addition to the poison schedule. The fact that poisoning still occurs points to one conclusion only, viz., that the Act should be made more stringent. That is how we deal with other Acts, the Adulteration Act, for instance. I have never seen it suggested that that Act should be repealed because adulteration continues.—Yours, &c., J. OSBORNE.

May 4, 1901.

KODAK, LIMITED, AND THE TRADE.

To the EDITORS.

GENTLEMEN,—In your issue of Friday last you did the Kodak Company the kindness of inserting a long and detailed letter explaining their whole case, from their point of view. Of course, they are advertisers in your admirable JOURNAL, and no doubt think they are fully entitled to your help; but, on the other hand, I am also a considerable advertiser in your columns, and trust you will extend to me the same favour and indulgence, and allow me, with my limited light as a retail dealer, to give my views as to the justice and effect of this intolerant and iniquitous policy enforced upon the trade throughout the kingdom. Now, sir, as an Englishman, I love freedom, and hate and detest bondage of any kind. During the whole of my life I have endeavoured to attain to a position of honourable affluence and independence, and after many years of constant application to my business, and by much zeal and energy, I had begun to hope that the object for which I had laboured so persistently and so zealously was within measurable distance of attainment, and now, when I should be in a position to commence to gather in the fruit of all my labour, I find that my position and independence as a trader is threatened, and in great peril, also that the very men for whom I had put forth my best endeavours, and whom I trusted and counted as among my best helpers and most reliable friends, have been conniving against me, and indeed against all my brethren in the photographic trade, for the purpose of depriving us of our commercial liberty and freedom, and of placing themselves in the position of little kings, sitting in state in Clerkenwell and New York, and dictating to every English dealer of whom he shall buy and what material he shall sell, and furthermore would reduce us to a condition of servitude that is absolutely worse than bondage.

I have very carefully read all the arguments used by the Kodak Company in their letter, and can only come to one conclusion, namely, that they are not arguments at all. If the Kodak letter does one thing more than another it is to condemn absolutely and entirely the action of this powerful and ambitious American company, who are, without a doubt, straining every nerve for the purpose of appropriating unto themselves the rights and privileges of every free English trader.

It is one of the signs of the times that all the smart and cute men who are crossing the Western Ocean at this time are doing so with one object in view, viz., the absorption of our English industries into "American trusts and combines," to be controlled either at New York or in some other American State. These efforts at control and domination have met with more or less success, as, for instance, in the steel, shipping, and other trades; but God forbid that anything of the kind should come to pass in our own young and thriving industry, as this would at once sound the death-knell of all industrial progress, of all improvement and invention, and of all liberty and freedom of contract; in a word, it would put back the photographic clock at least fifty years, and convert liberty-loving Englishmen into servants and tools of the Kodak Company.

It would be impossible for me in a letter to deal with the various points contained in the Kodak epistle, but I cannot refrain from noticing the point raised in paragraph 4, in which the writer suggests that in the event of the Kodak Company being compelled to withdraw the prohibitive and obnoxious conditions attached to their invoices of recent issue, they would also be compelled to withdraw the conditions regulating the prices of Kodak materials. Now, for my part, I cannot see in what way the withdrawal of this detestable principle of dictation, of domination, of appropriation, of combine, trust, and monopoly involves the withdrawal of the perfectly acceptable, legal, and moral principle of maintenance of fair prices all round. This

principle has been hard fought for, and is reasonably just and equitable to all parties concerned. It has worked well in the past, and one of the chief gainers under this system has been the Kodak Company themselves, who are not only wholesale dealers, but also retailers, opening up retail branches all over the country, in direct opposition to those retail dealers who have stood loyally by the Kodak Company, and thus, by their action, proving their disloyalty and pooling for their own company the full profits upon their own goods, and which I contend morally and lawfully belong to what this company are pleased to term their "dealer friends." Looking at this question from various points of view, I can only come to one conclusion, and that is that the threat to withdraw the condition for maintaining prices all round is mere bluff, or, in other words, the vapourings of a wilful and spiteful child. The Kodak Company has raised up this horrible bogey of price cutting for the purpose of knocking it down again, and, to my mind, these people will think twice before doing so, as without a doubt the chief sufferers in this event would be their own sweet selves.

I certainly think it is an insult to our British intelligence for the smart, cute Kodak Company to think that the British dealer and the British public would be so easily gulled by the use of such silly threats and wishy-washy arguments. For the Kodak Company to cancel the condition for the maintenance of fair prices all round would be to place themselves on an equality with the heathen Chinee, compelled to inflict upon himself the punishment of the happy dispatch, but to these people it would mean neither more nor less than financial and commercial suicide.

In the last paragraph of this pungent letter, the following spicy sentence occurs: "We think we may trust to the intelligence of our dealers to recognise the motives that underlie the action of these agitators." Now, sir, I should like to know who these said agitators are? Surely the Kodak people would not describe the writer of this letter as an agitator. I have been in the past one of their best customers. I have three large establishments, in each of which my assistants have done their utmost to push Kodak goods, as my books will prove, and I should no doubt have largely increased my business with them this year had it not been for this abominable attempt to deprive me of my liberty to buy of whom I like and what I please. What I have done has been done in self-defence, and I glory in the fact that it was the outcome of my own resolution that brought our Trade Association, which has been such a thorn in the flesh of these people, into existence. It was the outcome of my own resolution that has guaranteed the sinews of war, viz., a fund of £1000 or more for the purpose of defending any small dealer whom the Kodak people may attack, and other resolutions of a like nature also stand in my name, but as a retail dealer no sane man would dare to describe your humble servant as an agitator. What I have done and what my dealer friends have done has been done wholly and solely for the purpose of defending our own interests. As to the question of the intelligence of our dealer friends, the Kodak Company ought to know by this time that we are intelligent enough to see through the American veneer of smooth words and cunningly compiled sentences. Yes, sir, we have found them out, and intend to deal with them with great care and caution; and now, in conclusion, I would impress upon all our dealer friends as men to be manly and to have neither part or lot with these people, and, in my opinion, it is degrading to any man to place himself in such a position of servitude, for I contend that it is only as long as we are free and independent as a people in a commercial sense that we can reasonably expect to be successful and prosperous as a nation.—I am, yours, &c.,

R. GREEN.

81, Aldersgate-street, London, E.C., May 4, 1901.

To the EDITORS.

GENTLEMEN,—I am sure that all photographers will read with gratification the letter from Kodak explaining the self-denying motives which have prompted their late action in the matter of rollable films. It is no doubt necessary for them to come to the rescue of the helpless dealers who would ruin themselves by supplying their customers with what they want instead of confining themselves to the goods of the company. But is it not time that this sort of grandmotherly protection should be discontinued? Is it really true that neither dealers nor customers know their own interests? Why this zeal to protect small dealers?

It seems that small chemists, ironmongers, &c., are the objects of the company's paternal protection: men who combine in many cases ignorance of the goods they deal in with a desire for large profits on small sales. But what about the consumers? Have customers no interest in being protected from paying unnecessarily high prices for their wants? If the Kodak Company succeed in their attempt to establish a monopoly in rollable films, will they not benefit? I see that they say that the matter is not of much importance to them; but would it not increase their sales? and would it not compel every one who found an improvement on the films to make it known to th only, and to accept such terms as they choose to offer?

After all the consumer has some right to be considered, for in end he pays. The plate-maker or film-maker gets his money fr the dealer. He does not avowedly (at all events) share in the count. It is the dealer who gets it, and why should he not do w he likes with it? Why should he not be free to give part, or all of to any one he chooses if he so please?

I have no complaint to make against the small dealers. It i convenience occasionally to be able to pick up plates or films in neighbourhood where we are working, and for that convenience m reasonable men would be willing to pay. It is not therefore uni that the small dealer who supplies us should ask a higher price th the large one; but if it is right for the maker and dealer to mak bargain for their mutual benefit, why is it a crime for the dealer consumer to make such for their mutual benefit? The whole systen wrong. It is an attempt to coerce the consumers, who, I suppose, considered to be rich enough to pay handsomely, in favour of the sm dealers who want capital or skill, and in many cases both. Personal I regret the vanishing of small shops, especially those of artifice But it is in vain to regret that any more than the coming of railw travelling; the world changes, and evil comes mixed with go The great plate-making and camera-making concerns are, by th command of machinery and skill, ousting the small concerns: so t great dealers are ousting the small ones in many ways. Competit rules, and sooner or later must win, in spite of the efforts of t Kodak Company and their congeners to bolster up the small tra where it is not wanted. The trader who is prepared to supply a customer with what he wants will have an advantage over him w is foolish enough to bind himself to supply only one sort of goo The professional photographers have combined now; they may r gain the immediate object for which they have formed their unio but there is abundant scope for their efforts in checking all attempts control trade in their requirements, and I trust that they will be w enough to see that every argument why no one should be favoured at t expense of his own class is also one why no preference should be giv to any class. The best customer is fairly entitled to preferential tern and the mode in which he uses what he buys has nothing to do with unless it be presumably illegal.—I am, yours, &c., J. F. T.

May 4, 1901.

To the EDITORS.

GENTLEMEN,—For reasons which at first sight are perhaps not qui apparent, the photographic trade is peculiarly subject to the tyran of the various manufacturers. Some years back we had the action the plate and paper-makers' "ring," forcing up the price of son articles to make uniform prices; this was followed by the Germa baryta paper-makers' "ring," through whom the raw and enamell paper was almost doubled in price, and now Kodak wish to comp dealers to stock nothing but their films. "Corners" usually fail England, fortunately, but the peculiar conditions of manufacture in dental to articles used in the photographic trade seem to give phot graphic "corners" a better chance, for unfortunately the first tw succeeded in their object, but this is accounted for by the fact th almost the whole of the plate and paper-makers, at any rate all t larger ones, were in the "ring," and in the second the only two r paper manufacturers combined with the enamellers, and practica throttled the trade, and as all these articles require special machine and a large amount of technical knowledge, which cannot be suppli immediately, the photographers and dealers had nothing to do b submit until fresh makers came forward, but with Messrs. Kodak th case is entirely different. They have no monopoly of manufacture, o superiority, in films, and if dealers choose to play into Kodak's hand nobody can be blamed but themselves. Fortunately there are plent of other brands, every bit as good, if not better, than Kodak's, so photographers and dealers will only play them at their own game and refuse to have anything to do with Kodak films or other material until the restrictions are withdrawn, there is every reason to hop that one at least of these impertinent pieces of tyranny is likely t fail, for Kodak's, in common with other manufacturers, do not run their business merely on philanthropic lines, and therefore are no quite in a position to entirely dictate to their customers, and in th event of this "consummation devoutly to be wished," all fair-minde people will be inclined to agree that it is in the interest of the com munity that the tyranny of these large aggregations of capital should fail. Kodak's come forward with the same hypocritical reason as th plate and paper-makers did, viz., in the interest of the trade, and especially of the dealers, but we may safely assume that the interest o the trade and also of the dealers is centred in Messrs. Kodak, Limited.

If dealers and users are stupid enough to give in to this last piece of tyranny, what is likely to be the result? Are Messrs. Kodak likely to improve the quality of their goods, or reduce the price? Rather the reverse is likely to be the case, and, as they would have shut out other makers, people who wanted films would have to take Kodak's "for better or worse," probably the latter, possibly pay a higher price,

go without. Fortunately films are not an absolute necessity to a otographer, and I suppose are almost, if not entirely, used by ıateurs, and if Kodak carry out their intentions it is not a difficult ıtter to fall back upon plates, neither would this be a very great rdship in the majority of cases, except for cameras made exclusively films.

Dealers would do well to remember that Kodak are almost the ly wholesale manufacturers who compete with dealers in the retail ıde, so that their protestations of helping the dealers are not quite so sinterested as they might seem.

"Corners" seem to flourish best in the land of Kodak's nationality, ., America, which for some years past has been "corner" and "trust"- lden, but English people, as a rule, quite fail to see the benefits rived from "corners," probably because the benefits are not dis- ibuted widely enough.

Should a firm come forward with an article which is so far in ad- ınce of others that they can command the whole trade, and almost hatever price they like to charge, matters are on an entirely different oting; but then they require no bolstering up to make large profits. et Messrs. Kodak bring out a film which is so far ahead of all other akes that practically none of the others can compete with it, and ien they will have the market to themselves, without any boycotting. hey need not fear cutting prices, may charge their own price, and ace what restrictions their customers feel inclined to abide by, but ıtil they produce this film their best plan would be to do their busi- ess in the ordinary straightforward way, or perhaps their customers ay think that instead of their action being an indication of the ıperiority of their goods, it looks more like fear at the superiority ' other makers', and thus avarice will defeat its own ends.

Even should the dealers agree to Kodak's conditions and refuse to ock other makes, the other manufacturers may meet the plan through ieir advertisements in the photographic press, and by supplying films arriage paid to their customers, for this is an item which weighs lot with people using small quantities, and manufacturers can afford is by saving the discount allowed to the dealers. The only draw- ack is the trouble of sending to the manufacturer and waiting for ie goods, but if users of films will only put up with this slight in- onvenience for a time, should Kodak succeed with the dealers, this cheme of tyranny is bound to fail.—I am, yours, &c.,

May 4, 1901. C. T. Sutton.

To the Editors.

Gentlemen,—Kodak, Limited, defend their recently adopted re- trictive policy in respect of the sale of their commodities in a very lausible manner. It seems a very philanthropic policy on their part. But is it really so? If their view be correct, it is difficult to under- tand why they did not adopt so beneficent a scheme long ago. It also difficult to understand why many of the dealers who have been ractically compelled to agree to the recently imposed conditions of sale re, in a quiet way, doing their best to get the obnoxious restriction emoved.

Excessive competition is bad, but most people agree that monopolies re worse, and Kodak, Limited, will find it difficult to persuade the onsumer, who, after all, has to be consulted in these matters, as well s the dealer customer, that their beneficent and philanthropic scheme s to his advantage.

Kodak, Limited, say, "It must be evident that if dealers decide to o encourage imitations upon which there are no restrictions, we should ıot be in a condition to continue the practice of maintaining the list rice. There would be no option but to open the way to the consumer o secure our goods at any price that the dealers might like to harge." But is it evident? There may be certain restrictions, not f a monopolising tendency. There are several plate-makers, and they ll, I think, charge uniform prices for their goods, and they all appear o receive a fair share of custom. Most of them appear to be con- tantly enlarging their works. Do Kodak, Limited, consider that hey will retain a perpetual monopoly in roll film?

Kodak, Limited, say: "Our condition of sale is not directed to hutting out other products. . . . There is plenty of scope and oom for anything of fine quality." But why should the ordinary hannels of distribution be monopolised by one firm? Do Kodak, imited, contend that if an efficient film can be produced cheaper than hat sold by them, the manufacturers are to be practically restricted rom selling it at a price lower than the Kodak film—assuming, of ourse, that the margin of profit to the dealer is a fair one?

Kodak, Limited, say: "Every individual is perfectly free to buy vhat cameras and films he or she likes." Why, then, do not Kodak imited, allow the dealer equal facilities to give the public the oppor unity of doing so? Are they afraid of healthy competition? They ıave had a pretty good innings, anyway.

They say that their policy has already found favour with the majo- ity of their dealer customers. It is curious that the consumers have ractically universally protested against Kodak, Limited's, protective olicy.

Kodak, Limited, might do well to remember that their business in his country has been built up to a very great extent through the agency of free trade. They might remember that if this country had pursued the American policy of Protection, imposed high tariffs on imported goods, &c., their business in this country would probably have been more or less throttled in its infancy. That, no doubt, would have been a calamity, both to the users of the Kodak commodities and to Kodak, Limited. Still the fact remains; and the directors of Kodak, Limited, whether they be Americans or Britishers, might remember the fact.—I am, yours, &c., J. A. Reid.

Cutcliffe-grove, May 5, 1901.

To the Editors.

Gentlemen,—I am instructed by the Council of this Society to send you the enclosed copy of a resolution adopted by them at their meeting on the 2nd inst.—I am, yours, &c., Frank O. Field,

Assistant Hon. Secretary.

Southsea Amateur Photographic Society, 5, Pembroke-road, Portsmouth, May 4, 1901.

"That this Council views with grave suspicion the recent action of Kodak, Limited, in attempting to prevent the sale of rollable films and rollable film apparatus other than those of their own manufacture, and recommends all members of the Society to abstain from using any goods manufactured by Kodak, Limited, until the present restrictions are removed."

To the Editors.

Gentlemen,—At the conclusion of a consideration of the subject of "Panoram Photography," dealt with at the Borough Polytechnic Society on the 1st inst., when, without prejudice to the company, the merits and demerits of the new Panoram Kodak were discussed, the following resolution was unanimously adopted, and copies ordered to be sent to Kodak, Limited, the Photographic Trade Association, and to the photographic press:—"This Society strongly protests against the action of Kodak, Limited, in imposing certain restrictions on the photographic trade in the sale of roll films and roll film apparatus, and pledges itself to support any movement to obtain the removal of such conditions. The Society also urges its members to abstain from purchasing any Kodak apparatus or materials during such time as the Company maintain their aggressive attitude towards fair competition."—I am, yours, &c., P. C. Cornford.

To the Editors.

Gentlemen,—At the meeting of the North Middlesex Photographic Society on May 6, the President in the chair, a resolution was unanimously passed condemning the action of Messrs. Kodak, Limited, in these terms:—"That this Society, whilst fully recognising the services rendered by Kodak, Limited, to photographers, deplores the threatened importation into this country of methods of trading opposed to British ideas of fair play, and can only regard the company's action as an attempt to establish an injurious monopoly, and that a copy of the resolution be sent to Messrs. Kodak Limited."—I am, yours, &c.,

The Hon. Sec.

To the Editors.

Gentlemen,—I fail to see, from Kodak's own showing, that there has been the least misrepresentation of the meaning or scope of their new conditions of sale, it has been understood that so far they wish to have the exclusive sales of rollable films, and so to secure this would bind all from selling other makes if they sell theirs. If that is not an attempt to control the trade in this line, I do not know the English language.

That most agree on the matter of protection of prices goes without saying, and hence in my last I ventured to hope that Kodak would agree to supply on conditions that the purchaser did not undersell; this, I think, would have been dignified on their part, at the same time it would have carried with them the larger proportion of dealers in the kingdom. I very much question if there is any manufacturer or wholesale dealer in any other trade or profession that would venture to send a representative through the country to sell their goods on the basis that the purchaser must not buy the same class of goods elsewhere, though if he said, "We sell on the condition that you do not buy elsewhere, to undersell us," we should be disposed to listen to his reasons for such a demand, and should order if we considered the goods offered were saleable to our customers, for that is the test of purchasing.

The plea that these conditions are to protect the dealer per se is rather too transparent to mislead. The P. and P.M.A. argued that way, but few failed to see it was intended as self-protective, but I am confident that it drove a lot of trade away from them.

Kodak argues "that the small and medium dealers would be liable to extinction if they do not adopt their present policy." I do not think so, if an agreement can be come to by a large majority not to undersell. Let competition be fair, let the trade set their face against cutting. Then to adopt Kodak's words, "There is plenty of scope and room for anything of fine quality," and all would be interested in selling good things by whomsoever made; the best would be sure to hold its own, as "it is an utter impossibility to compel the public

to buy one brand only of certain goods." So if the dealers should be foolish enough to stock "bad goods" when they can get good to sell at the same price, they surely alone would be the sufferers, and so in the long run the best would win.

Goods as well as men are only superseded by their own deficiencies, If this be true, let Kodak keep up their standard or raise it even higher, and they have no cause to fear; but if they resort to craven methods to hold what they call their own, they will find these very methods will push their trade into the hands of those they apparently fear.—I am, yours, &c., PROFESSIONAL.

To the EDITORS.

GENTLEMEN,—If not encroaching on your valuable space we should like to make a few remarks in reply to the lengthy vindication by Messrs. Kodak in your last issue of their recent conditions to the trade. While recognising that they have every right to make whatever conditions of sale they may think necessary for their own protection, we would like to quote their own words that "Good products will always come to the front;" then why all this bother to keep them there, at the risk of interfering with the right of the individual. We would like to say in reply to their query, as to whether "the interested agitators are prompted entirely by philanthropy," that though one does not meet with much of that commodity in business, even from such a wealthy firm as Kodak, that there are still traders with sufficient self-respect to object to such conditions being imposed upon them, and though we do not pose as philanthropists, we may say that though their conditions would never affect us, as we should never handle goods carrying such conditions, and think we could still manage to supply the requirements of the public, we are prepared to support any fair and reasonable opposition to their recent conditions as far as we can, and, on principle alone, as on no other grounds do we consider it would affect us.—I am, yours, &c.,

Pro. Newton and Co., H. W. NEWTON.
Fife-road, Kingston, May 7, 1901.

SOAP AND TOBACCO PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—There are one or two points in Mr. Owen Glendower's letter in your issue last week which, I think, require a little more consideration than he bestows upon them.

In the main I agree with his remarks, and fully believe that the photographer of good standing and artistic ability has little to fear from cheap competition. But cheap competition is not what we complain of. It is the absurdity of the copyright law, which fosters unfair competition, and permits photographic works of art to be reproduced at a cheap rate by men who had no share in their production. Mr. Glendower says "the cure does not lie in any hope of special protection, copyright or otherwise, but in the elevation of work altogether above the level of the soap and tobacco photograph."

I want to know, sir, how we are to raise our work above the level of the soap and tobacco photograph? The answer would be simple enough if Messrs. Lever and Ogden were supplying cheap photographs taken from life. But this they are not doing, and Mr. Glendower seems to overlook the fact that the higher we raise the standard of our work the more artistic photographs will these firms turn out, since it is simply the results of our labour and study that they are reproducing. It is no uncommon thing for persons, even of good social standing, who require a large number of photographs, to go to the highest class photographer they know, and secure the best results that his skill, artistic taste, and experience can produce; then, after ordering the smallest number of copies possible, to have them reproduced elsewhere, say at 6s. per dozen.

Surely this kind of thing will affect the photographer who is even able to catch "a father showing a youngster the face of his watch," or "take snap-shots on a creepered verandah."—I am, yours, &c., T. B.
May 7, 1901.

DR. GRUN'S LENS.

To the EDITORS.

GENTLEMEN,—It would be interesting to know where "infinity" will begin with Dr. Grün's lenses working at f-0.84 and f-1? The existing tables do not provide for the contingency of such apertures.—I am, yours, &c., MAX H. FERRARS.

Redaktion "Der Amateur-Photograph"
(Ed. Liesegang's Verlag Düsseldorf).
Freiburg in Baden, Wall-str. 24, April 4, 1901.

PHOTOGRAPHIC OPTICS.

To the EDITORS.

GENTLEMEN,—I forgot to mention in my letter last week that the example I gave of the difference in depth of field with a 5 in. and a 10 in. lens is for a circle of confusion of one-hundredth of an inch.—I am, yours, &c., W. B. COVENTRY.
May 3, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *includ queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inatten to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer c munications through the post. Questions are not answered unless the na and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business aff should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellingt street, Strand, London, W.C.*

ART.—Messrs. Boussod, Valadon and Co.,, Bedford-street, Strand; Mes Haenfstaengl, Pall Mall: Messrs. Braun and Co., Paris.

CRITICISM INVITED.—"APPRENTICE" writes: "Might I ask your opin of enclosed print, as regards lighting, retouching, &c.? Coul be classed as professional work? I would like to hear y criticism of it."—In reply: The picture is a very pretty little The work altogether is good. We should have preferred the di sidelight to have been a little more subdued, though the pict is good as it is.

PLATINOTYPE PRINTING.—"PLATINOTYPE" asks: "(1) What is the diff ence in the image, or coating of a platinum paper that requi no development, and one that does? (2) Are the results from b the same, as regards permanency and clearness?"—In rep (1) In the printing-out platinum paper the reducing agent is ad with the sensitising salts in the preparation of the paper. (2) should say so, as regards the permanence. The printing-out pl num papers are, comparatively, but little used, as the success working of them depends very much upon hygroscopic conditions

DARK ROOM LAMP.—T. D. M., jun., says: "In a recent issue of yo JOURNAL, a contributor mentioned a dark room lamp, construct so as to allow of a solution of potassium bichromate being us as the medium for filtering the light. I should be obliged if y could inform me of an easy way to make such a cell? I shou also like to know what thickness of solution to use, and wh cement will keep the glasses in place without being attacked?" In reply: The simplest, and best, cell for the purpose is German glass dipping bath, such as is used for the silver soluti in the wet collodion process. Joining up a glass cell, and keepi it watertight, is not an altogether easy thing to do. These bat are about the right thickness to use for the bichromate solution.

WASHING NEGATIVES.—"HYPO" asks: (1) How long is it positive necessary for negatives to wash in a syphon tank, with a f force of water upon them? (2) If negatives should not have be sufficiently washed, how long a period would it be before t appearance of hypo can be detected?"—In reply: (1) No defini time can be stated as so much depends upon the thickness of t gelatine film. Some films are much thicker than others, and co sequently require a longer washing. No harm results from washi for a longer time than is absolutely necessary. (2) That, of cours depends upon the amount of hypo left in the film, and its dryne An imperfectly washed negative will often show stains after o or two prints have been made from it, if the paper, or the fil be damp at the time.

SPOTS ON ENGRAVINGS.—"TROOPER" writes: "My attention has be called to some steel engravings, upon which are to be seen so whitish spots. They are in frames, and on the glass, just whe the spots on prints are to be found, there appears a little pat similar to mildew. As these have been hung on perfectly d walls I fail to see that damp is the cause. I have been asked reframe them and try to take the spots off. Can you help me stating probable cause of the same, and by saying if I can make th good again, and by what process?"—In reply: Without seei the prints we can offer no opinion. Probably, however, the spo are due to mildew, and if they will not wipe off we should recon mend you to place them in the hands of one who is au fait wi cleaning engravings, which apparently you are not. A valuab engraving may easily be ruined by a novice's attempts at cleani it.

PRINT WASHING.—"DOCTOR DEE" writes: "(1) I have just purchase a new print washer (Marion's sectional), but I am rather dubiou about its efficacy, and wondered if you have had any experien with the apparatus. In theory the idea seems right, but whe you take the prints out they are all one on top of the other i the various sections, and the query in my mind is—are they pr perly washed and free from hypo? Then again, "stuck to th tapes," is not that as bad as that stuck print to print? I a not asking for your recommendation of any apparatus, but simp for your expert opinion as to the reliable work of the machine i question? (2) The particular brand of P. O. P. used by me, an liked the best is '——'s paper,' and is recommended to be tone in the separate bath, without any previous washing. Does th practice affect in any way the permanence of the prints? It i much easier than so much washing, and gives fine results, but i not reliable, of course not worth doing."—In reply: (1) If print is put into each section they cannot be one on the other We should say that, under these conditions they would be thor oughly washed. The prints resting on the tapes is not the sam as their being stuck "print to print." (2) See reply to "Trooper in last issue.

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EX CATHEDRÂ.

An important Copyright Decision.

Last week we gave a very brief report of a case that was tried in the King's Bench Division, before Mr. Justice Wright, a few before, and this week we print the "Times" report in

This case is more than one of passing interest to ers of copyright in photographs from a very particular t of view, beyond the very substantial sum that the ntiff recovered from the defendants. The case was this: plaintiff, for the fee of a guinea, gave the proprietors of " Graphic " the right to reproduce a photograph in that er. Afterwards, however, they used the picture for 'Golden Penny," of which they are also the proprietors, out asking his sanction, or paying a further fee—a not mmon thing for some illustrated papers to do. The ntiff, thereupon, took action for the recovery of pens. The more usual method is for the recovery of ages, and here is what is of great interest to owners of right. According to the Copyright Act of 1862, action be taken for damages, or for penalties, or for both damages and penalties. This was a point decided some few years ago in the case of "Tuck and Sons v. Priester." Although both damages and penalties are recoverable, it is probable that if a heavy sum is recovered in the form of penalties that fact would weigh against the award of a heavy sum as damages. Now, the point for consideration by photographers, whose rights have been infringed is, which is the best procedure, the recovery of damages or penalties, for all who have had their copyrights infringed, very naturally, desire to recover the largest sum they can for the injury done. In some instances, particularly where the issue of the paper is small, it will often be better to proceed for damages, but where the circulation is large, as it was in the present case, it will be better to go for penalties. Now, the maximum penalty is ten pounds for each copy printed. This, if inflicted in the case of a paper with, as many have, a circulation of a hundred thousand, would amount to just a million pounds—a sum, however, that is never likely to be awarded. But, as the plaintiff's counsel, Mr. Foote, K.C., pointed out, the plaintiff was entitled to a penalty of a coin of the realm, of one amount or other, for each copy. Now, the smallest coin of the realm is a farthing, and that was the sum the judge, Mr. Justice Wright, awarded, and it amounted to but a few shillings short of ninety pounds, and costs. Another important point in the case was this. One of the defendants stated that 86,230 of the "Golden Penny" containing the photograph were printed, but that only 82,230 copies were sold. But the plaintiff's counsel contended that the penalty, according to the Act, was for every copy made, whether it was sold or not. The learned judge, after perusing the Act, said counsel was right, and gave judgment accordingly, for £89 11s. 8d., with costs. The object of the foregoing is to point out that photographers, whose work has been pirated by the illustrated press, would often obtain a greater sum by entering a suit for penalties than one for damages, inasmuch as when the case is clear the laws says that a penalty is incurred for every copy printed, and the court has no option but to assess that at a current coin of the realm. Hence, in the case of a paper having a large circulation, even at a farthing a copy, the penalties come to a

substantial amount. If, in the case quoted above, damages only had been sued for, it is a little doubtful, seeing that the right to reproduce was, in the first instance, sold to the "Graphic" for a guinea, whether a sum to the extent of nearly ninety pounds would have been recovered.

* * *

An "Apoquartz" and a new Peristigmat Objective. At a recent meeting of the Société Francaise, M. Wallon gave some details of a new objective which has been made by M. Morin, on the basis of Dr. Rudolph's calculations. The glass for the lenses was made by the well-known firm of Parra Mantois and Co., and quartz was also used, the latter being cut transversely to the crystalline axis, in order to avoid the double refraction of the light. The lens possessed most of the qualities of the modern anastigmat and the residue of spherical aberration belonged principally to the yellow rays, so that it actually defined more sharply on the plate than on the focussing screen. M. Wallon also exhibited two lenses made by M. Gorde, specially for fixed focus hand cameras, one with a focus of 75 mm., the other 90 mm. By the aid of a heavy baryta glass, M. Gorde has constructed these after the style of the well-known periscope of Steinheil, that is with two single lenses. The aperture was found to be slightly larger than *f*-10, and the chemical focus to be about 3 mm. within the visual. It was stated that considering their cheapness their definition was very satisfactory when compared with the modern anastigmat. To these lenses the name of Peristigmat has been given.

* * *

Sartorial Criticism of Royal Academy Pictures. Our contemporary, the "Tailor and Cutter," is as amusing as usual in its criticisms on the pictures in this year's Royal Academy Exhibition, and points out how totally ignorant artists are of art—"Sartorial Art," of course. In some of the portraits, it says, they have not painted the seam of the trousers in quite the right place, or they have depicted a button on the coat a little too high, or too low, according to the most recent fashion amongst tailors. It speaks of morning coats without any seams in the back, vests showing only two buttons, lop-sided coats, &c. Our contemporary remarks that, "We wonder the hanging committee passed such smudges just because a small portion of the canvas happens to be carefully painted. We trust they will give more attention to these details in the future, or else limit the number of portraits shown; for to ignore the dress of a man or a woman is to ignore that to which most of the latter, at any rate, give a considerable amount of attention, and which is a most important item in character delineation." The "Tailor and Cutter" also remarks: "The tailor is not above learning from the artist, and why should the user of the brush be on such a high and mighty pedestal that he cannot stoop to learn from a knight of the shears? If it were only his loss we would not complain so much, but when he professes to portray a gentleman dressed in the garments of the age and we find the latter grossly misrepresented, then we complain and charge him with libel, as in many cases he has reproduced the garments, which have been stylishly cut and artistically made, in a way that would bring the blush of shame to a slop-worker, to say nothing of a West-end tailor." Oh, ye R.A.'s, A.R.A.'s, and aspirants for these honours, why do ye not study the tail fashion plates and the graceful attitudes of the figures picted, and also the dummies shown in the clothiers' w dows, and so learn how Art should be represented accord to the sartorial idea. Furthermore, would it not be w that a few tailors should be appointed on the hanging c mittee, so that all pictures showing misplaced buttons, sea ill-cut coats, and the like, could be rejected? That wo tend to teach artists Art from a tailoring point of view. the way, the number of our contemporary that contains above criticisms also contains a fashion plate of juve dress. This, in itself, with the "graceful" (?) not to impossible poses, should be studied by painters, as from they may be able to learn what is sartorial art—and com with it. We are not aware that our contemporary has e criticised the portraits, and the garments, shown at any the photographic exhibitions, but it is possible that it n do so. Therefore, photographers beware, and if you h a sitter with an ill-fitting coat refuse to take him in it, if you do take him, don't send the picture to an exhibiti or you may incur the censure of the sartorial critic.

* * *

New Electric Lamp. News comes from the Columbia Univers of a new form of lamp which, if in prac anything like what was seen at a conversazione of the In tute of Electrical Engineers, held at the University, sho revolutionise existing methods of electric illuminati Lamps of 500 and 1000 candle-power were arranged ordinary 100 or 200 volt lighting main, and "burnt" b liantly. The light being deficient in red rays is not pleasant until modified, as the ordinary incandescent ligh but that very point would make them more valuable photographic purposes. As stated, they burn on a circ of ordinary voltage; but before they can be started the c rent has to begin at a high voltage. This is brought ab by the interposing of a Wehnelt interrupter, or other s able means. The principle of construction is entirely dif ent from that of the ordinary incandescent lamp: they m be said to be true glow lamps, and would appear to be m of the nature of the well-known vacuum tube. They c sist of glass tubes filled with mercury vapour, a current electricity being passed through from a negative of merc to a positive of iron. The lamps are the invention of P. C. Hewitt, and are stated to be exceedingly econom the consumption of energy being only half a watt, or l per candle. From the accounts to hand, the exhibition the occasion named was a complete success.

* * *

New Apparatus for Celestial Photography. As scarcely need be observed the gr difficulty in photographing celes objects is the need for some paratus, the simpler the better, for keeping the ject stationary in the field. Some time ago Professor Li mann took the problem in hand, and suggested a form apparatus. The idea was a mechanical contrivance to attached to the dark slide, so geared to the driving mech ism of the siderostat itself, as to compensate for the ro tion of the field. Professor Cornu had been working w similar aims, and calls attention in "Comptes Rendus" the plan he had devised, the principal factor being the e ployment of a universal pivot. M. M. P. Gautier has pr tically anticipated these discoverers, and, at a recent me

f the French Academy of Sciences, described an actual ratus he had devised, which is a simple mechanism noving the plate with an angular compensating move- exact enough to enable a good negative to be taken a short exposure.

* * *

Bolometer he trum.

It is not very far short of a score of years since we first described this invention of Prof. S. P. Langley. Since then much has done with it; but, unfortunately, at that end of the rum of least interest to photographers. When Sir Newton first discovered the spectrum, the only clue ad to the rays was the series of visible colours. At eginning of this century Sir William Herschel discov- that the spectrum extended beyond the visible red, as n took place when a thermometer was placed there. In Professor Langley took the subject up and found heat tches, as it were, at the same end. Dr. Draper, at National Academy of Sciences, at Washington, sug- l that there was a length of spectrum, such that if the ary visible spectrum were represented as one, the very f the invisible end of any spectrum at all, would be ss than three. At a recent meeting of this Academy, ssor Langley exhibited a map of the spectrum, in the visible spectrum was one foot long: the invisible bed out by his bolometer) extended to almost twenty This instrument has possibly the most delicate per- n, if the phrase may be used, of any physical appar- n the world. It is stated to be capable of measuring one thousand millionth of a degree Centigrade! He rought it to such perfection that he is hopeful that dications, which vary remarkably according to the s, may lead to an actual power of weather prognos- n far in excess of anything now attempted.

* * *

ng lated

Those who are in the habit of keeping any quantity of this substance, frequently store it in tin carboys; but where it is essential to have rely free from contamination, it is possible this method rage may have to be abandoned. In a foreign phar- tical journal, M. Malméjac narrates some experi- he has been making upon the results of the contact ious metals with alcohol of 95 degrees (there is little that methylated alcohol would conform to the same He finds that iron, tin, lead, and galvanised iron, when d to remain in alcohol at a temperature of 15° C. °.) for six months, in all cases gave up a portion of their nce to the alcohol where it remained in solution. But was without any action. This metal, however, would rather expensive holders; but if it be desired to take tage of M. Malméjac's discovery we may say that g could well be simpler and more effective than the glass carboys, such as are used by manufacturers for orage of mineral acids.

THE CONVENTION.

I.

PPROPRIATELY printed in blue, with a gilt title piece, and in white glacé silk, the Handbook to the Oxford ng of the Photographic Convention of the United Kingdom, which will be held from Monday to Saturday, July 8 to 13 next, has just been issued. The book is in itself a record, and elegantly heralds what we believe will prove to be a record meeting of the Convention seven weeks hence. Counting the illustrations, and the advertisement pages, this year's Convention Handbook, which is by far the most tasteful of the series that has been produced, reaches a total of about eighty pages. The principal credit for this striking advance in size and quality, a sure sign of the Convention's increasing popularity and prosperity, must be given to Mr. F. A. Bridge, whose work as editor and compiler has been carried out with characteristic vigour and thoroughness. In the preparation of the book Mr. Bridge has received the most valuable assistance from members of the Oxford Executive, a recognition of whose kindly co-operation it is one of the objects of this introductory article to place on record at the earliest moment. Seldom, indeed, in Convention history has there been such a strong manifestation of local co-operation as in the present case. The frontispiece, a portrait of the President, Sir William Herschel, is from a negative by Miss Acland, whose graceful portrait studies and colour work by the Sanger Shepherd process prove her to be one of the most able lady photographers that we have. The plan of Oxford with the attached key, which will, no doubt, be called into constant consultation during Convention week, is taken by permission from Messrs. Alden's well-known Oxford Guide. Turning over the pages we come to views of Magdalen College, by Mr. H. W. Taunt, Oxford; Iffley, by Messrs. Hills and Saunders, Oxford; Warwick Castle, by Mr. Walter Nelson; Cæsar's Tower (Warwick), by Mr. Harold Baker; and Compton Wynyates, by Mr. W. Sansbury. These illustrations, to which we must add a photogravure by Messrs. Vaus and Crampton, from a negative by Mr. Bridge, of "Saint Mary the Virgin, Oxford," and specimens of three-colour printing by Messrs. John Swain and Son, make the Convention Handbook delightfully pictorial, without detracting from its use and value as a guide to visiting photographers.

In this last respect the Handbook is a model compilation. It will be seen by the considerable extracts relating to the week's arrangements, which we print on another page, that every point upon which information is likely to be sought by Conventioners has been anticipated. Indeed, if the book is studied page by page for a few minutes daily, the Honorary Secretaries will not be called upon to answer needless or superfluous questions, and thus their time will be economised. From the pen of Mr. R. A. R. Bennett, a practised writer on photography, there is a description of the architectural beauties of the magnificent old city, which should be of great help to photographers in mapping out their week's work. We once heard an Oxford man say that it would take him a fortnight to describe what the photographer could find to do at Oxford, and then he doubted if his task would be finished. Mr. Bennett is apparently embarrassed with riches of a similar nature, for he thus concludes his excellent article: "To state with any completeness the architectural features connected with the various parish churches, and antiquarian remains of the ancient city, is impossible in the space at my disposal, and the visitors must be left to fill up any gaps with the help of the numerous guide-books published by booksellers on the spot." A further paper from the same pen deals with the charms of the river Thames between Oxford and Dor-

chester, and Mr. Bennett also writes of Warwick, Leamington, and Kenilworth. Mr. William Potts concludes the descriptive articles with one on Banbury, Compton Wynyates, and Broughton Castle.

The splendid opportunity which the Oxford Convention will afford the members for using their cameras in a classic centre, the renown of whose historic grandeur and fascination has penetrated to the most remote parts of the globe, and over which there hangs, the richest of canopies, the inspiring glamour of a grand antiquity, is set forth in detail in the well-filled programme, some of whose plums we are laying before the reader. That programme, however, has other features to which notice should be directed. The Convention, it will be observed, is to be officially welcomed to the city by the Mayor, Mr. G. Claridge Druce, M.A., no stranger to photography, and who is probably fully cognisant of the vast influence which it exercises over the life of the day. This official recognition of the Convention by the Oxford municipality will be appreciated not only by the members there assembled, but by all photographers who desire, with reason, to see one of the most beautiful and far-reaching crafts of the late Victorian epoch stand high in popular esteem. A most valuable privilege, we are pleased to announce, has been conceded to members of the Convention, desirous of making the most of their opportunities at Oxford. "By the courtesy of the authorities, every facility will be given to those members desirous of photographing in the colleges, college grounds, gardens, parks, &c., from July 8 to 13 inclusive. It is imperative that the Convention badge should be worn." So runs the paragraph in the Handbook. A concession of this kind, in itself a high privilege, is alone sufficient to stamp the Oxford Convention as a unique function, and we are confident that the graceful courtesy of the authorities in the matter will be especially prized by the assembled photographers. At previous Convention meetings mild complaints have been made that some of the most cherished architectural treasures had attracted such crowds of photographers that the solitary or contemplative worker has been baulked in his special selective efforts and time exposures, but surely at Oxford, Warwick, and the other places to be visited, the wide wealth of peerless subjects will give scope for all to work in roomy comfort!

We turn with unfeigned satisfaction to that part of the week's proceedings which embraces the evening meetings. Fortunate in having as President this year one who bears a name that is illustrious in the annals of science, we believe that the members of the Convention will be addressed by Sir William Herschel on colour-photography, a subject in which he is known to take a deep interest. The Savilian Professor of Astronomy at Oxford, Mr. H. H. Turner, M.A., F.R.S., has also consented to deliver an address. His subject will be "Photography in Relation to Astronomy." Those of our readers who have perused the Professor's recently published book on "Modern Astronomy," will allow that he there handles his theme with the skill and assurance of a master: and we are justified in looking forward to his Convention address with feelings of pleasurable anticipation. It is also expected that Dr. Moritz von Rohr, of Jena, will specially attend the Oxford Convention for the purpose of reading a paper on an optical subject. Dr. von Rohr is, perhaps, the highest living authority on the history and theory of photographic optics, and wil warmly welcomed at his first Convention. The rema two papers will be "Seeing not believing," by Mr. mough Webster, and a demonstration with the proje microscope and polariscope, by Mr. W. Wyatt: both tlemen are thoroughly practical workers, and intere discourses may be expected from them. No previous vention has been so rich in the promise of its intelle fare. We look to the Oxford meeting to have the beneficial influences on photographic knowledge. It i first of the century, and the first, we hope, of a long ser increasingly promote the main object of the Conve [Rule II.]: "The Advancement of Photography."

COPYING PHOTOGRAPHS.

THERE are some points regarding this subject that will a little fuller elucidation than is possible in the necess brief Replies to Correspondents—a study of the va pages of which will demonstrate that there are still m who feel at sea in this particular branch of photogra a branch that is always a needful and usually a profi one to the average professional photographer. The se for lantern-slide making has passed; but a supply of n tives for the purpose will be useful against the time winter draws near, and there are few lectures illustr with slides in which there is not a demand for some drawing, or book illustration to be reproduced for sho upon the screen. When a page from a book, and espec so when several are to be copied, it is more readily by placing a piece of plate glass against it, and packing page against it by suitable means. The method we seen adopted with advantage is to supply the usual cop screen, erected on the board that carries the camera, wi casing in which slides a piece of glass. The book is flat, opened at the required illustration, and the leaf set right, its back lying just below the level of the glass. glass is then slipped in position in front of the page, and latter kept flat against it by a stiff millboard kept pre against leaf and glass by one or other simple arrangement can readily be devised. When all is in position, an exposure made, it is simply a matter of replacing one tration by another, or sliding the glass away for a ment, and packing the next required page as before ag the glass, to find everything in focus and ready for e sure. With a fairly constant light a series of illustrat can be copied one after another, and developed all at time when the exposures have all been made. The as we have seen it in use, appeared extremely easy, an expeditious as easy. When the illustration is of l dimensions it is desirable to put a black screen in fron the camera, as otherwise reflections of external ob might be superposed upon the image, and so spoil negative.

We may say that the method of copying behind g is suitable for almost every picture of moderate dim sions that it is desirable to copy. Manuscripts ca treated the same way, and it will be found that there be no trace of back reflections or blurring through glass. One important condition is that the glass mus of good quality, i.e., free from yellow stains and havin air bubbles. Thin plate glass is the best to emp

rther, it is necessary that it should be quite clean and e from any trace of atmospheric deposit as is likely to ur if it be left in position, unused for any length of ne. The only case in which we have observed any ill- ect from the use of glass in front of a photograph has en in a series of process reproductions of popular cha- ters in a well-known weekly illustrated. The pictures d all been signed in white on a dark ground, at the lower t of the print, and the signatures had evidently been lected from front to back, and then forward to the lens, e effect being a blur in that portion of the picture.

Every one is familiar with the lantern slide copied from engraving or print on thin paper, on the back of which re is printing, this printing showing most prominently the slide. It is quite unnecessary to get this effect. the print be of little value the back of the paper where letterpress shows should be painted black all over; en all is dry there will not be a trace of lettering show- on the negative. When the print is valuable, and may be tampered with, it should be pasted down on to a ce of ferrotype or papier-maché block, and afterwards ked off. The letterpress again will not be seen.

It frequently occurs that a print or plan brought to be ied is creased or has fold marks; it is impossible to entirely rid of this effect, however it be lighted, or wever tightly it may be packed against glass. The per procedure is to damp it thoroughly, and on the back ce a margin of flour or starch paste for about a quarter an inch all round, and then to lay the print down on lat portable board—nothing is better than a drawing- ard. When it is quite dry every crease will have ished, and the picture is ready for copying. To remove print from the board a sharp pen-knife should be run ng each edge just within the pasted part. The print will n come away and retain its flatness almost entirely when noved. It may be that objections would be raised against ucing the margin of the print. In that case the original st be lined by pasting it on to a piece of paper about an h wider all round. The whole is then pasted, after the hion just described, upon a drawing-board, and when re- ved the backing paper only is cut through, and the print l be slightly stiffer; but it will then be found that all e creases will be gone, and the print cut away in splendid dition, slightly stouter and stiffer because of the back- g, but in all other respects improved. It may be noted at if the creased print was one of the sort described (with nting at its back), the backing paper should be one with black surface.

The method of illumination for copying with the best sults might, with advantage, be considered, but we have w not sufficient space. It is, however, probable that we y before long return to this aspect of the case, trusting at what we have already written may prove of value to ose having work to do in what we have described as a anch of photography needful and lucrative.

OLDER FORMS OF PORTRAIT LENSES.

[Translated from the "Zeitschrift für Instrumentenkunde."]

the spring of last year, through the kindness of Dr. G. Aarland, I eived a two-inch portrait lens of the Petzval type, made by the m of Voigtländer, bearing the number 3811. It is evident that the specimen was made before the firm introduced chromatic correction in the manufacture of their photographic lenses, and from the number it may be inferred that the lens dates from the beginning of the fifties.

It being probable, from these considerations, that the lens was of the earliest type, an exact measurement of the radii, thicknesses, and separations was made. The data obtained for the radii were in very satisfactory agreement with twice the figures given in my work on the "Theory and History of the Photographic Lens." The difference did not in any case exceed more than 0.9 per cent., and from this it seemed safer to keep to the constants of the radii as given by Fr. Voigtländer, but nevertheless to ascertain the thicknesses and separations from the specimen at our disposal, especially in consideration of the fact that some uncertainty prevailed as to the separation in the back combination.

Compared with the constants which had been previously adopted, the most surprising deviation lay in the distance of separation of the two combinations. This was considerably less, and did not amount to more than about two-thirds of J. Petzval's specification, which was one-third of the focus of the front combination. At the same time it is rather less, in comparison, than that of Voigtländer's first objective, which was examined a short time since by Dr. R. Steinheil.[1] The second separation (between the elements of the back combination) was also found to be larger, but this fact had been observed before.

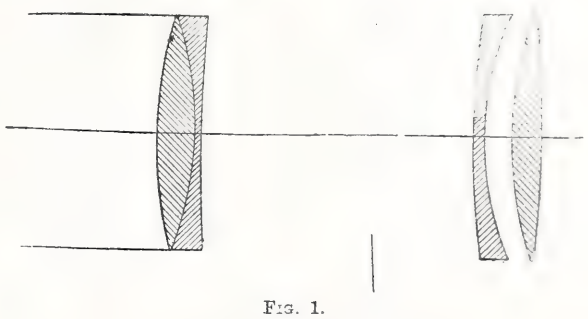


FIG. 1.

J. PETZVAL'S PORTRAIT LENS.

Reduced to $f_D = 100$ mm. Calculated for $\frac{f}{3{\cdot}4}$ and $\omega = 15°$.

Radii r_ν, Thicknesses d_ν, and Separations b_ν, measured on the axis in millimetres.

$r_1 = 55{\cdot}9$	$d_1 = 4{\cdot}7$	$r_4 = 110{\cdot}6$	$d_3 = 1{\cdot}5$
$r_2 = 43{\cdot}7$	$d_2 = 0{\cdot}8$	$r_5 = 38{\cdot}9$	$b_3 = 3{\cdot}3$
$r_3 = 460{\cdot}4$	$b_1 = 21{\cdot}0$	$r_6 = 48{\cdot}0$	$d_4 = 3{\cdot}6$
	$b_2 = 12{\cdot}6$	$r_7 = 157{\cdot}8$	

KINDS OF GLASS, n_D.

$L_1 = L_4 = 1{\cdot}517$
$L_2 = L_3 = 1{\cdot}575$

The calculation shows a small improvement in spherical correction, which at its maximum amounts to about -0.15 mm. The deviation from the fulfilment of the sine condition does not exceed more than about -0.1 mm. for 100 mm. focal length. This combination, however, shows a marked difference with respect to the correction of the oblique pencils. Astigmatism is reduced to a minimum within an angle of 8° to 9° inclination in front, and only amounts to about 0.7 mm. at 15°, whilst the curvature of field at 15° inclination only necessitates about 2 mm. displacement of the focussing screen.

If we summarise the facts we come to the following conclusions:—The combination reduced to 100 mm. focus exhibits similarity of radii in comparison with those originally given by J. Petzval. We see that experiments were made from the first (1840) by altering the distances of separation. Nevertheless these were in the same direction: less separation between the two combinations, and greater separation between the elements of the back combination, as shown in the specimen,

[1] J. M. Eder, "Das erste Petzval'sche Portraitobjectiv." "Photogr. Corresp.," xxxvi., page 274, 1899. See also BRITISH JOURNAL OF PHOTOGRAPHY, May 26, 1899, page 325.

No. 3811. But it must be noted, in opposition to these early data, that J. Petzval, in 1857, referred to greater separation in his writings (one-third of the focus of the front combination). We may here remark that our knowledge of Petzval's landscape lens, the orthoscope, is much more unsatisfactory. We are indebted to Dr. J. M. Eder[2] for his recent publication of the text of the Austrian Patent Specification of this lens, together with a photographic reproduction of the drawing. Unfortunately the patent specification does not contain any measurements, and as the English translator of Eder's article pointed out, the drawing and the description in the text do not agree. According to the latter, the uncemented diverging crown lens has its more concave surface facing the achromatic combination, whilst the drawing shows the less concave in that direction. To remove the contradiction, it must be assumed that, in those parts of the patent specification, convexity of curvature is understood, where curvature is mentioned.

2. Dallmeyer's Portrait Lens.

Mr. Th. R. Dallmeyer has been kind enough to give me particulars of the kinds of glass used by his father for the type of portrait lens patented in England in 1866. The front combination was made of Chance's soft crown and light flint, and the back of the same firm's hard crown and light flint. For the purpose of the calculation the

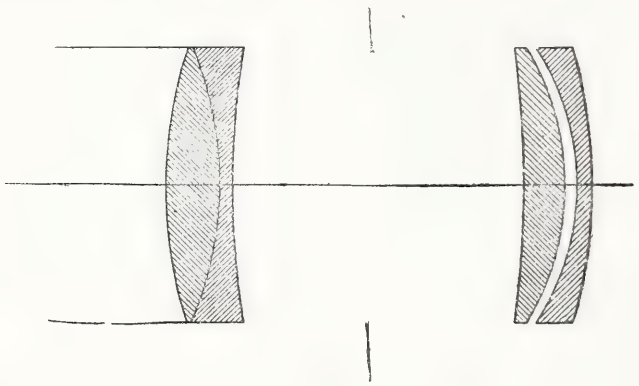


Fig. 2.

J. H. DALLMEYER: PORTRAIT LENS.

Reduced to $f_D = 100$ mm. Calculated for $\frac{f}{3{\cdot}0}$ and $\omega = 15°$.

Radii r_ν, Thicknesses d_ν, and Separations b_ν, measured on the axis in millimetres.

$r_1 = 52{\cdot}2$		$r_4 = 556{\cdot}4$ (concave).	
	$d_1 = 6{\cdot}5$		$d_3 = 5{\cdot}2$
$r_2 = 45{\cdot}4$		$r_5 = 34{\cdot}8$	
	$d_2 = 1{\cdot}7$		$b_2 = 1{\cdot}3$
$r_3 = 260{\cdot}8$		$r_6 = 31{\cdot}1$	
	$b_1^* = b_2^* = 17{\cdot}4$		$d_4 = 1{\cdot}6$
		$r_7 = 62{\cdot}3$	

* Assumed to be half the distance of separation.

Kinds of Glass, n_D.

$L_1 = 1{\cdot}5151$
$L_2 = L_4 = 1{\cdot}5738$
$L_3 = 1{\cdot}5179$

figures of the corresponding kinds in Schott's catalogue were taken, and the separation of the elements of the back combination, which may be altered for modification of the condition of spherical aberration, was taken corrected for yellow light. The other data were taken from the patent specification. Concerning the type, we would remark, that the front lens consists of a bi-convex crown cemented to a bi-concave flint, as in the Petzval objective, but the construction of the back combination differs from the latter completely. The rays transmitted by the front combination are first converged, and then diverged, and from this arrangement it can be understood that the condition of spherical aberration is greatly influenced by the separation of the two elements.

The divergence in intersection of the rays at an aperture of f-3 does not exceed more than about −0.3 mm. That of the foci is slightly more, and amounts to about −0.4 mm. The condition of the oblique p resembles very closely that of the lens previously described. The amount of astigmatism is extremely small, and at an inclinati 15° is 0.5 mm., whilst the curvature of field for the marginal p the image only necessitates displacement of the ground glass more than 2 mm.

Taken alone, the amount of spherical aberration is very small quite unobjectionable in portraiture, for which purpose the instru is intended. In fact, it may be pointed out that means are pro for separating the back lenses to introduce spherical aberration at The great difference, which is observable with a spherically cor system, between the definition in the plane of sharp focus and in front and behind, may thus be reduced.

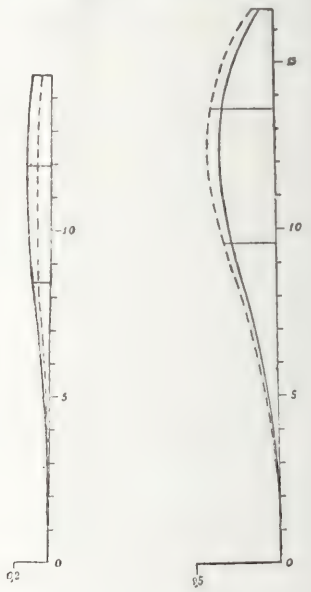


Fig. 1A. Fig. 2A

The ordinates represent the height of incidence in mm. (for f_D=100 mm.) abscissæ of the lineal curves represent the longitudinal aberrations from the dis of intersection of the axial ray. The abscissæ of the dotted curves represen longitudinal aberrations from the focus of the axial ray.

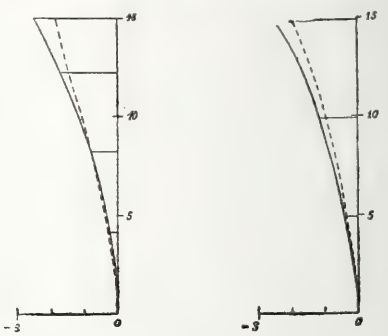


Fig. 1B. Fig. 2B.

The ordinates represent half the angle of view in degrees. The abscissæ o lineal curves represent in mm. the amount of displacement of the screen for focu the sagittal pencils as measured from the focal point. The abscissæ of the d curves give in mm. the amount of displacement of the screen for focussing meridional pencils as measured from the focal point.

Dr. Moritz von Roh

THE PHOTOGRAPHIC CONVENTION OF TH UNITED KINGDOM.

Sixteenth Annual Meeting, Oxford, July 8 to 13, 1901.

The meetings and exhibition of apparatus, pictures, &c. will be h in the New Municipal Buildings.

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[2] J. M. Eder's "Petzval's Orthoscop." Eder's "Jahrbuch für Photographie," page 108, 1900. See also the English translation: "Petzval's Orthoscope," British Journal of Photography, xlvii., page 696, 1900.

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NOTICES TO MEMBERS.

On Monday, July 8th.

The Hon. Secretaries will attend all day from 10 a.m. in the Assembly Room, New Municipal Buildings. Members are requested to report themselves as early as possible, receive their badges of membership, and secure tickets for the excursions.

Signature Book.

It is desirable that members, immediately on arrival, should enter their names, full addresses, and where staying in Oxford, in the signature book at the Assembly Room.

Plan of Oxford.

A plan of the city with references showing the positions of the principal buildings, &c., will be found in the Hand-book.

The Town Hall and Assembly Room, where the Conversazione, Evening Meetings, and Exhibition are held, form part of the New Municipal Buildings. These are situated only a few yards from Carfax, and are numbered 36 on the plan. Tram cars from the railway stations to Carfax every eight minutes. Fare, one penny.

Excursions.

Members should obtain tickets for these as early as possible, in order that adequate provision may be made for their comfort and convenience.

With regard to Tuesday's river excursion, it is absolutely imperative that members desirous of going, should write to the Hon. Secretaries, Photographic Convention, Town Hall, Oxford, so that the letter is delivered not later than first post on Monday, July 8.

Hotels.

A list of Hotels will be found in the Hand-book. A summary of the charges is given, but members are advised, where possible, to obtain a printed tariff on arrival; there can then be no misunderstanding as to terms.

Private Apartments.

Members preferring Private Apartments (of which a large number will be available) are requested to communicate with the Local Hon. Secretary, Mr. G. W. Norton, 13, Park-terrace, Oxford, who will forward a list of rooms, with terms, &c.

Annual Dinner and Smoking Concert.

The Annual Dinner and Smoking Concert, at which ladies are welcomed, will be held in the Clarendon Hotel.

Exhibition of Apparatus, Pictures, &c.

An Exhibition of Apparatus, Pictures, &c., will be held in the Assembly Room during Convention week.

Demonstrations.

In connexion with the Exhibition, Mr. Charles L. Burdick will demonstrate the use of the "Aerograph" for finishing platinum prints, bromide enlargements, &c.

Messrs. Kodak, Limited, will demonstrate the working of their "Dekko" paper.

The Platinotype Company will demonstrate the methods of using their Oxy-magnesium Lamp, both for portrait work and the photographing of interiors; the development of platinotypes, &c.

Lantern Slide Exhibitions.

There will be an exhibition of specially selected Lantern Slides under the direction of Mr. F. A. Bridge, in the Town Hall, after the President's Address, on Monday evening, July 8.

On Thursday evening there will be shown a collection of slides by members of the Oxford Camera Club, and on Friday the Lantern Microscope and Polariscope will be used in connexion with Mr. Wyatt's paper.

Evening Meetings.

On Thursday and Friday evenings the meetings will commence at 8.30.

Permission to Photograph.

By the courtesy of the Authorities, every facility will be given to those members desirous of photographing in the Colleges, College grounds, gardens, parks, &c., from July 8 to 13 inclusive. It is imperative that the Convention Badge should be worn.

READING ROOMS.

Visitors who may be members of the Cambridge or Durham Union Societies, or of the Dublin Historical Society, are reminded that they have the right of using the reading and writing rooms, &c., of the Oxford Union Society, as if they were life members of the Oxford Union Society, their names and addresses being first entered in a book in the steward's room. Members of the Association Générale des Etudiants de Paris, and of the Société des Etudiants of the University of Bordeaux, have similar privileges, on producing a certificate of membership of their Societies. The Oxford Union Society's Rooms are entered from St. Michael's-street, or from a passage leading from Cornmarket-street.

UNION INTERNATIONALE DE PHOTOGRAPHIE.

The Council is pleased to anonunce that the members of L'Union Internationale de Photographie, have decided to hold their Annual Gathering at Oxford in conjunction with the Photographic Convention of the United Kingdom. A programme in French has been issued by the Council, and the members of the Union may rest assured that a hearty welcome awaits them.

ARRANGEMENTS.

MONDAY, JULY 8.

For the benefit of those members of the Convention who will be in Oxford previous to, or early on Monday, members of the Local Committee will attend at the Meeting Room, Town Hall, to act as guides, and parties will, at convenient times, be conducted over the Colleges, &c.

CONVERSAZIONE.—The opening conversazione will take place in the Town Hall at 7.30 p.m., when the members will be officially welcomed to the city by the Right Worshipful the Mayor of Oxford, G. Claridge Druce, Esq., M.A., who will be supported by an influential Reception Committee and members of the Oxford Camera Club.

The Convention will be declared open, and the President, Sir W. J. Herschel, Bart., will deliver his address. After a short interval, there will be an exhibition of specially selected lantern slides.

The Town Hall is a magnificent room, surrounded on three sides by a balcony, and capable of seating nearly 2000 persons. It is elaborately decorated in relief, gold and colour, and contains a grand four-manual organ, built by Messrs. Henry Willis and Sons, under the supervision of the late Sir John Stainer.

TUESDAY, JULY 9.

River Excursion to Abingdon and Dorchester.—Leaders: Mr. Alderman J. H. Salter, J.P., and Mr. G. W. Norton.

The special steamer will leave Folly Bridge at 9. A short stay will be made at Iffley to visit the celebrated Norman Church, and at other convenient places, to photograph picturesque parts of the river. Abingdon will be reached about 11.30. Lunch in the Council Chamber at 1 p.m. The Mayor of Abingdon, Mr. Alderman J. T. Morland, will preside. Leaving Abingdon at 2, Day's Lock (the terminus) will be reached at 3.30 p.m. Tea will be served on board at 5 p.m.; return at 7 p.m., reaching Oxford at 8.30.

Plates may be obtained on board the steamer, and a dark room for changing will be provided.

The accommodation for this excursion is limited, and it is absolutely imperative that members desirous of going should write to the Hon. Secs., Town Hall, Oxford, so that the letter is delivered not later than the first post on Monday, the 8th. Places will be booked in order of application Tickets, including Steamer, Luncheon, and Tea, 6s. 6d.

There will be no meeting at the Assembly Room on this evening.

WEDNESDAY, JULY 10.

The Annual General Meeting and Election of the new Council will take place at the Assembly Room at 10 o'clock.

The new Council will meet at 11 o'clock.

The President invites the members to a Garden Party in the Gardens of Worcester College at 3 p.m.

The Official Group will be taken by Messrs. Hills and Saunders at Worcester College at 3.15.

The Annual Dinner and Smoking Concert will be held at the Clarendon Hotel at 7 p.m. Lady members are cordially invited to be present at the dinner and concert. Tickets (not including wine), 5s. 6d.

The musical arrangements are in the hands of the Local Committee, and a very attractive programme is being prepared for the occasion.

THURSDAY, JULY 11.

Excursion to Warwick.—Leader: Mr. Harold Baker. The train will leave the Great Western Railway Station, Oxford, at 8.42 a.m., arriving at Warwick at 9.56.

The Warwick Dry Plate Co., Ltd., have kindly invited the members to luncheon at the Court House at 1.30. Sir Montague Nelson will p side. The Mayor of Warwick will also be present.

The Earl of Warwick has kindly ordered that special facilities offered to the members to take photographs of the exterior of Castle.

Special arrangements have also been made to enable members photograph the Parish Church and celebrated Beauchamp Chapel, L Leycester's Hospital, &c.

Mr. Austin Edwards will arrange a dark room for plate chang at the Court House.

Brakes will be in attendance to take members to Guy's Cliff (1½ mil and Kenilworth (5 miles) at fares to be arranged according to numbe

The return train will leave Warwick at 5.57 p.m., reaching Oxf at 7.17.

Tickets, including railway fare, fees at Castle, &c., 6s. 6d.

At the Town Hall at 8.30 p.m.—An Address by Professor H. Turner, M.A., F.R.S., Savilian Professor of Astronomy, &c., "Photography in relation to Astronomy;" after which there will an exhibition of lantern slides by members of the Oxford Camera Clu

FRIDAY, JULY 12.

Excursion to Banbury, Broughton Castle, and Compton Wynyat Leaders: Mr. Seymour H. Beale, Hon. Sec. of the Banbury and D trict Photographic Society, and Mr. W. Potts.

The train will leave the Great Western Railway Station, Oxfor at 8.42 a.m., arriving at Banbury at 9.17. Parties will be conduct round the town. There is a dark room for plate changing at t Technical School, Marlborough-road.

Brakes will leave at 10.30 for Broughton Castle (2½ miles). Faci ties for photographing the Castle have been kindly granted by Lo Algernon Gordon Lennox.

At 12 noon the party will leave for Compton Wynyates. Picn lunch in the grounds (by kind permission of the Marquis of Nort ampton) at 2 p.m. The brakes will leave about 4 p.m., reaching Ba bury at 6 p.m. The return train leaves Banbury at 6.45, reachin Oxford at 7.17. Fares, including railway, brake, and lunch, 7s. 6d.

At the Town Hall at 8.30 p.m., a Paper by Dr. Moritz van Röhr (c Messrs. Carl Zeiss, Jena). Title to be announced.—A Paper by Mr. G Watmough Webster entitled, "Seeing not believing" (with lantern dia grams). Followed by "A Demonstration with the Projection Micro scope and Polariscope," by Mr. W. Wyatt.

SATURDAY, JULY 13.

Parties will be conducted round the Colleges. Short excursions by road or river as may be desired.

DARK ROOMS.

Oxford.—Assembly Room, Town Hall; Y.M.C.A. Rooms, George street (provided by Messrs. Hills and Saunders); the Museum, The Parks; Mr. G. C. Druce, 118, High-street; Mr. A. Holliday, Photo Dealer, 17, Broad-street; Mr. H. G. Varney, Chemist and Dealer, 71 High-street; King's Arms Hotel, Holywell; Roebuck Hotel, Corn market-street.

Warwick.—The Court House.

Banbury.—Technical Schools, Marlborough-street.

IMPORTANT COPYRIGHT CASES.

[SOME remarks on the first of the two cases quoted below will be found on our first page. Both reports are taken from "The Times." We are informed that the cases were conducted with the assistance of the Photographic Copyright Union, and it will be observed that the plaintiff in one instance was a photographer in business at a considerable distance from London. This fact, we are asked to state, disposes of the erroneous idea that the Union does not help country photographers in copyright disputes.—EDS. *B.J.P.*]

NICHOLLS V. PARKER AND ANOTHER.

IN this case (before Mr. Justice Wright) the plaintiff, Mr. H. W. Nicholls, a photographer, carrying on business at Johannesburg, sued the defendants, who are the proprietors of a weekly newspaper, known as the "Golden Penny," to recover statute penalties and damages, and for an injunction to restrain them from copying or multiplying for sale and from continuing to sell in their publication unauthorised reproductions of the plaintiff's registered copyright photograph representing "Officers buying Shells as Curios from Kaffir Women." The defendants pleaded that they had purchased the copyright of the photograph in question from the plaintiff, and were entitled to reproduce it

any of their illustrated papers. Alternatively, they claimed to have implied authority to reproduce the photograph on payment of the m of one guinea for such reproduction, and set up a custom in their ade to this effect.

Mr. Foote, K.C., and Mr. G. W. Ricketts appeared for the plain- f; and Mr. Marshall Hall, K.C., Mr. Lawless, and Mr. Temple Franks r the defendant.

The plaintiff's case was that he was the registered proprietor of the notograph in question. He was a photographer in business at hannesburg, and when the war broke out in 1899 he began to take notographs for the purpose of making money out of selling the right reproduce them. He supplied the defendants, who are the pro- ietors of the "Graphic," the "Daily Graphic," and the "Golden enny," with photographs from time to time, and received payment r them. In consequence of some difficulties which had occurred the aintiff adopted the course of giving a written licence with the photo- aph in question, under which the defendants were permitted to re- oduce it in the "Graphic," but not in the other papers belonging to em. The photograph, notwithstanding, appeared in the "Golden enny;" and it was in respect of this alleged infringement of his pyright that the action was brought.

Mr. H. W. Nicholls, the plaintiff, in giving evidence, said he carried business as a photographer in South Africa. He took the photo- aph, the subject-matter of the action, himself, and registered himself proprietor of it at Stationers' Hall. He granted a licence for the notograph to be reproduced in the "Graphic," but in no other paper. Cross-examined by Mr. Lawless, he said that the photograph in ques- n was taken at the foot of Spion Kop on August 6, 1900. He had d transactions with the defendants for some years, and had been nding them photographs since 1899. In November of that year he d written to the defendants saying he was sending them twelve ews, and asked them, if they were unable to use them, to hand them er to the "Daily Graphic" or "Golden Penny."

Mr. G. R. Parker, one of the defendants, subpœnaed by the plain- f, said that 86,230 copies of the "Golden Penny" containing the otograph were printed, and 82,000 were sold.

Mr. Lawless, for the defendants, said the action was one for damages breach of contract, or tort, and for penalties, and it was clear e plaintiff could not obtain both. He should contend that the aintiff was only entitled to damages and not to penalties, because ere had been no wilful piracy by the defendants, who had only acted er the licences had been given to them, as they had been in the bit of doing previously, owing to a slip. In the case of "Tuck and ns v. Priester" (19 Q.B.D., 629), Lord Esher, in giving judgment, d:—"We must be very careful in construing that section, because imposes a penalty. If there is a reasonable interpretation which oids the penalty in any particular case, we must adopt that con- uction. If there are two reasonable constructions, we must adopt more lenient one."

Mr. Foote, for the plaintiff, referred to the cases of "Ellis v. Mar- ll" (11 "The Times" Law Reports, p. 522) and "Ex parte Beal" (R., 3 Q.B., 387). He contended that section 11 of the Act 25 and Vict., c. 68, gave the plaintiff the right to recover damages as well penalties. They were not suing for damages, but only for the nalty, and all he asked for was an injunction and the penalties under Act.

Mr. Lawless said that the damages should be only nominal in this e, and asked whether his Lordship held that he was bound to im- e the penalties.

Mr. Justice Wright said it was not he who imposed the penalties, the section of the Act.

Mr. Lawless said that the distinction between the present case and se in which penalties had been imposed was marked. In all those es there had been something in the nature of a criminal offence, but the present case there was nothing of the kind.

Mr. Justice Wright, in giving judgment, said that in this case the aintiff was the registered proprietor of a photograph, and gave the endant the right to use it. The defendant published it in the per mentioned in the licence, and also in another paper belonging him without the plaintiff's consent. In these circumstances it med to him that he was helpless in the matter, because, according the authorities, the defendant was liable to pay damages, and these assessed at one farthing. He was also liable to a penalty, which, was held in "Ex parte Beal," must be a penalty for every copy of paper in which the photograph wrongly appeared. He did not his way to get out of the law laid down in that case, which was owed in "Ellis v. Marshall;" and, though he regretted the strict- s of the law in a case such as the present, where no great harm s done, he could quite see that it would be greatly against public icy if people were allowed to evade the provisions of the Act. thought he must hold, therefore, that there must be a hing penalty on each of the 82,000 copies sold. The wer of the defendants to the case was that there had been ac- escence by the plaintiff with regard to what the defendants had done contravention of the licence. The evidence of acquiescence had ken down. Then it had been suggested that there was a custom of the trade which justified a publisher who had received a licence to insert a photograph in one paper to insert it in another, contrary to the licence, and then tender the money for it. That was a ridiculous suggestion. It was also said that under the Act there could not be recovered both damages and a penalty. The 11th section expressly said that this could be done, and it was so held in "Tuck and Sons v. Priester." It was also urged that there could be no penalty imposed unless there was a criminal mind in the person infringing the copyright. He could find nothing in the section which said so. Judgment would, therefore, be for the plaintiff for damages and an injunction as prayed and for a penalty of one farthing on each of the 82,000 copies of the paper sold.

Mr. Foote submitted that the penalty should be imposed on the 86,000 copies printed, since the section inflicted it for "repeating," and not for exposing the picture in question for sale, and consequently it was not necessary that they should be so exposed.

His Lordship said that seemed to be so, and assessed the penalties at £89 11s. 8d., and gave judgment for the plaintiff, with costs. A stay of execution was granted in view of an appeal.

HOWLETT v. ROBERTS.

THIS was an action for infringement of the plaintiff's copyright in two photographs, one of which represented a woman holding a contents bill of the "Evening News" with the words "Surrender of Pretoria" on it, and the other represented a boy displaying a contents bill of the "Sun" bearing the words "Relief of Mafeking." The defendant was election agent for the Conservative candidate for the Romford Division of Essex at the general election. He had embodied the two photographs in a leaflet, of which 40,000 copies were printed, the bulk of which copies were distributed to the electors with the election address of the Conservative candidate. By the defence to the action the infringement was admitted, though the defendant's counsel stated that the defendant had made use of the photographs in ignorance of the fact that they were copyright. The only question was as to the amount of penalties payable, and it was contended for the plaintiff that he was entitled to recover at least one farthing for each copy.

Mr. Alderson Foote, K.C., and Mr. G. W. Ricketts appeared for the plaintiff; Mr. Holloway for the defendant.

His Lordship gave judgment for the plaintiff for £41 13s. 4d.

News and Notes.

A PROGRAMME of a photographic excursion to the Bernese Oberland, Switzerland, personally conducted by Mr. William F. Slater, from June 15 to June 30, can be obtained from Mr. Slater, at 5, Firs Parade, High-road, Lee, S.E.

NATIONAL Photographic Record Association.—At the invitation of Sir J. Benjamin Stone, there will be a meeting of of the National Photographic Record Association, at the Midland Grand Hotel, St. Pancras, Wednesday, May 22. Afternoon tea will be served at four o'clock. A report will be presented and a discussion invited as to the best manner of carrying on the work, and some recent contributions will be laid upon the table.

CITY and Guilds of London Institute.—The programme of technological examinations including regulations for the registration and inspection of classes in technology and manual training for the session 1901-1902 has been issued by Messrs. Whittaker and Co., Paternoster-square, Price ninepence, net. Post free one shilling. Pages 57-61 are devoted to the photographic examinations which will be held from April 23 to April 26, 1902.

THE West Surrey (Clapham Junction) Photographic Society is starting for use among the members a circulating portfolio, much, we see, on the usual lines, but with a rule making it work in with the Society's meetings, and not to act as an independent item. To obtain free criticism from fellow-workers is one of the principal reasons for a Society's existence, and this seems certainly a way to secure it; its value, however, depends on the use made of it by the members themselves. The following are the rules: "The portfolio is to be retained for not more than three days by each member, or four, if a Sunday or public holiday intervene. Each member shall forward the portfolio to the one next on the list, inserting the dates of receipt and despatch in the book provided for that purpose. Each member shall insert one print in the portfolio every time it reaches him, all the prints shall circulate twice. The prints after the second circulation will be withdrawn by the secretary and returned to the members at one of the ordinary meetings of the Society (notice of which will be given by him) when general criticisms of the prints will be invited. A member failing to contribute in two consecutive rounds shall not be entitled to receive the portfolio. All prints should be mounted and placed in one of the descriptive sheets provided for that purpose upon which the criticisms shall be written. A memorandum book shall accompany the portfolio for notes, suggestions, &c."

THE International Union Delegates.—MM. Davanne and Pector have been nominated by the Société Francaise de Photographie as delegates to the joint meeting of the International Union and the Photographic Convention at Oxford. M. Davanne, who is so well known as the author of some of the standard text books on photography, has just signified that his increasing age compelled him to decline the Presidentship of the Société Francaise, and he was unanimously elected Honorary President of the Council of Administration.

A NEW Intensifier.—M. Hélain suggests in the current number of "La Photographie" the use of stannous chloride as the blackening agent after bleaching the negative with mercuric chloride, as the most suitable agent to obtain a more permanent image than is given by the usual blackening agents, and which has the advantage of being readily prepared, and the following is his formula. After bleaching with mercury, wash the negative well and then immerse in—tartaric acid 2 parts, stannous chloride 2 parts, water to 100 parts; when the blackening is complete, which will be in a few minutes, wash well and dry.

THE annual dinner of the Camera Club was held on Thursday, May 9, Sir William Abney, F.R.S., the President, being in the chair. Sir William praised the part which amateurs have taken in the development of the art since the days of Fox-Talbot, the first really scientific photographer. To the Club he paid a high compliment for the opportunities it afforded of interchange of ideas which often led to scientific advances. Other speeches followed, made by Mr. O'Farrell, the Hon. Secretary, who gave a satisfactory statement as to the position of the Camera Club; Mr. Asbury Greene, Mr. Creswell, secretary of the Society of Chemical Industry; Mr. Cadett, and Mr. Webber. In the course of the proceedings the chairman made the presentation of an illuminated album and a handsome cheque to Mr. Seyton Scott, for several years the secretary of the Club.

THE New Comet.—The new comet, recently discovered by the Cape Observatory, has not, up to the present, put in an appearance in this country. We read, however, from a telegram received in London, from the Observatory at Mauritius, that it has been seen there, and that a photograph of it has been obtained. The telegram also states that three distinct tails are visible, the longest being fifteen degrees. It is a long time since photographers in England have had a chance of photographing a comet, and there is very little doubt that if this new one becomes visible here at night plenty will attempt to secure a photograph of it, although they may not be possessed of an astronomical telescope. If it happens to prove as brilliant as some comets have been there will, with rapid plates, be no difficulty in obtaining fairly good pictures of it with an ordinary camera.

THE Royal Society Conversazione.—The annual conversazione of the Royal Society, held last week, was, as usual, a brilliant affair, and photography and skiagraphy were well to the front. Mr. Mackenzie Davidson showed, for example, a series of stereoscopic transparencies of electrical discharges, and stereoscopic skiagrams of bullet wounds. Mr. Wimshurst showed some photographs which possessed some of the properties of the light emitted by X-ray tubes. These photographs proved that the rays may be reflected as are light or heat rays. Sir J. Norman Lockyer, the Rev. W. Sidgraves, and Mr. Frank McClean, showed photographs of the spectra of Nova Persei, which were very interesting. There was also a fine collection of cloud photographs by Commander Wilson-Barker. The Cambridge Observatory showed an apparatus for accurately measuring astronomical photographs. There was also a number of demonstrations with the electric lantern in the meeting room. Owing to the death of Queen Victoria, it is announced that the ladies' conversazione will not take place this year.

MESSRS. A. W. Penrose and Co., 109, Farringdon-road, E.C., are issuing an excellent little pamphlet of instructions for practical photo-lithography. In a few words on the possibilities of the process they point out that photo-lithography becomes a comparatively easy process now that it is possible to obtain a reliable ready-prepared transfer paper, which only needs to sensitised in a similar way to carbon tissue. Any photographer accustomed to carbon printing can soon get into the way of working this process, and the zinc or copper printer of process engraving houses should find no difficulty in working the same along with his ordinary routine work. Even lithographers with no photographic knowledge can soon get into the way of working the process. Photo-lithography should, therefore, have a much wider application, and it would be well for photographers and process engravers to consider the advisability of adding it to their business, where they have not already done so. The expense of plant is comparatively very small, the majority of the articles, or substitutes for them, being found in any photographic studio. There are in nearly every important town lithographers who would be glad to have photo-transfers, if possible to obtain the same quickly and cheaply, but who do not want to set up a plant for themselves. The pamphlet may be obtained free on application to the above address. Another of Messrs. Penrose's pamphlets is devoted to a description of their process camera.

Commercial & Legal Intelligence.

MR. J. Lizars, of 101 and 107, Buchanan-street, Glasgow, is issuing a list of secondhand and shop-soiled cameras at greatly reduced prices.

THE Thorn and Hoddle Acetylene Co., Ltd., advise us that in consequence of the expansion of their business, they have taken more commodious premises, comprising show-rooms and offices on the ground floor, 135, Victoria-street, S.W. (near Victoria Station), which will be th address on and after May 11, 1901.

MESSRS. Potts and Co., of Bury-court, St. Mary Axe, are issuing new catalogue of photographic and laboratory bottles, measures, funn developing trays, spirit lamps, and glass and porcelain ware for chem work. Messrs. Potts intend issuing a separate list for each trade group of trades. The present photographic list will be followed various other lists as soon as they can be revised and compiled.

MESSRS. R. J. Appleton and Company, of Bradford, writ "We have just opened a fresh branch in the heart of the city (Mark street), where we intend to keep practically every photographic p duction that the amateur is at all likely to require. We opened Monday, May 6, with a display of about three hundred 'Kodak' s other cameras. We have provided two dark rooms for the use amateurs, and our Mr. Appleton, junr., will be in charge, and, togeth with his assistants, will be ever ready to give assistance and advice all inquirers. The optical part of the business will be under the dir personal supervision of our Mr. Appleton, junr."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
20.....	Walthamstow Photo.....	Ordinary Meeting.
21.....	Croydon Microscopical Society	*Astronomy without a Telescope, w special application to the Study Meteors and Shooting Stars.* L. N. Filon, M.A., F.R.A.S.
21.....	Gospel Oak	Demonstration: *Cristoid Films.* Mess Sandell Films and Plates, Ltd.
22.....	Croydon Camera Club	*The Hand Camera of To-day.* A displ of various makers of Hand Came will be held.
22.....	G.E.R. Mechanics Institution...	*Isochromatic Work.* Mr. Bennett.
22.....	Redhill and District	*Stereoscopic Photography.* A. H. Dunnir
23.....	Camera Club	*Recent Improvements in Ozotype.* Manley.
23.....	London and Provincial	Lantern Night. A. L. Henderson.
25-28	Liverpool Amateur	Excursion: Stratford-on-Avon and d trict. Leader, Wm. Harvey.
25.....	South Manchester	Excursion: Haddon Hall. Leader, F. Pickard.
25.....	Walthamstow Photo.....	Excursion: Burnham Beeches.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION

MAY 9,—Mr. W. McRae in the chair.

Mr. James E. Hodd handed round a negative on Sandell film with print therefrom, and drew attention to the advantages it possessed wi regard to rendering a difficult subject somewhat prone to halatio and to the full density and "crispness" that could be obtained.

Mr. R. J. Kindon showed a result by a non-halation plate. Some ve brightly lit windows in the subject were completely reversed owing the excess of light, but there was no sign of halation.

Mr. Hodd passed round a new magnesia cylinder for the oxyhydrog light. They were capable, he understood, of withstanding any atmo pheric conditions without disintegration or loss of quality. He did n know how they compared with the limes at present in vogue as regar light-giving qualities, but hoped the Association would make some co parisons.

Mr. A. Haddon did not see why the light given off should be infer to that of the lime cylinder.

Mr. A. J. Brown referred to the tele-photo attachment shown by M Everitt at the last meeting and said that, although it might be th best, lightest, and cheapest that had yet appeared, he wished to show similar attachment made by himself some four or five years ago, or the time when Dallmeyer brought out his tele-photo lens. It consiste of a negative element from a short telescope or single opera glass. I construction, of course, might be lighter, but as regards its work h showed two negatives of some printed matter, one made with a Ro rapid symmetrical, and the other with the added negative element. Th amplification was about three times. and the definition was good. A a cheaply contrived substitute for the accurately computed instrumen that the market offered, it was perhaps worthy of notice.

Mr. Leather showed one of the 12 by 4 Al-vista panoramic camera which came under discussion at the previous meeting. He showed tha it gave both instantaneous and time exposures, the slowing down fo the latter being effected by attaching fans of varying sizes to th mechanism. A time exposure up to three seconds was provided for The user may also, if he desire, expose the film in sections, and get fo instance on one 12 by 4 piece of film two 5 by 4 negatives and so forth The camera is made in five sizes, the largest being for exposures o 7 by 21 inches.

Mr. Leather also exhibited the 5 by 4 "Cycam" folding camer with Busch lens, and Bausch and Lomb Unicum shutter. The finde was in the shape of a collapsible rectangular frame on the front, use in conjunction with a spy-hole at the back. A steel walking-stick tripo was also shown and erected. Although somewhat heavy compared wit the light aluminium stands of the present time, in durability and rigidity it seemed to have decided advantages.

Mr. P. Everitt brought up for the purpose of testing a colour screen for its optically worked qualities a small "flat." The chairman com

lained some weeks ago that the surfaces of a screen he was using were ery far from true, and the screen on being placed in contact with the at was shown to be very irregular indeed.

PHOTOGRAPHIC CLUB.

AY 8,—Mr. Hutton P. Smith in the chair.

Mr. George Eason showed a number of lantern views, chiefly of Greek nd Eastern scenery, with several pictures of Paris, and some portraits f the "at home" character. The glimpses of places figuring largely scriptural history naturally attracted attention. Jerusalem, Damas-us, Bethlehem, and many other cities in Palestine were represented, he views being modern ones, all taken within the last few years. reece was more extensively illustrated by photographs of Athens, the iræus, Patras, &c., and some excellent views of the Acropolis, the arthenon and other renowned edifices were included. The pictures ere received with manifest approval.

Croydon Camera Club.—Mr. H. E. Carr gave an informative lecture n Wednesday, 8th inst., which attracted a large attendance of members, n various kinds of P. O. P., and their behaviour when toned in differ-nt baths. He explained with considerable detail the advantages and awbacks of gelatino-chloride paper, and the manipulations necessary order to avoid double toning, pink tones, patchy toning, yellowed gh lights, and other defects likely to ensue through want of knowledge. is experiments were carried out entirely with Burrough Welcome's pho-graphic tabloids. Many of the well-known brands of paper had been sted, including Cadett's, Wellington's, Ilford, Paget, Imperial, and enus. The last-named is, however, not a gelatino-chloride paper. oned in gold and hypo, it yields a fine series of browns. With the atinum bath some delightful warm blacks are obtained. The lecture as listened to with much attention. An animated discussion ensued, which Messrs. Salt, Wratten, Mees, Bynoe, Noaks, Irving, Edwards, ogers, and Isaac took part. At the instance of Mr. Hector Maclean, e President, seconded by Mr. Kough, a warmly applauded vote of anks was accorded to Mr. Carr. A lively debate followed upon the con-deration of a letter from Kodak, Limited, asking the Club to rescind a solution against Kodak, Limited's, attempt to restrict their dealer stomers trading in competing rollable film material. On the motion Mr. Watson, seconded by Mr. Allbright, it was decided to approve a aft letter submitted, which the Hon. Secretary was ordered to send to odak, Limited, confirming the Club's resolution.

Patent News.

HE following applications for Patents were made between April 29 and ay 4, 1901:—

RINTING BY ARTIFICIAL LIGHT.—No. 8886. "Improvements in Apparatus for producing Photographic and like Prints by Artificial Light." EMILE CHARLES VARRY.

HUTTER RELEASE.—No. 8909. "Improved Apparatus for Automatically Releasing the Shutter of a Photographic Camera." Complete specification. CARL WEISS.

LASH-LIGHT APPARATUS.—No. 8914. "Improvements in and relating to Flash-light Photographic Apparatus." Complete specification. HARRY BARNES SHAEFFER.

AND ATTACHMENT.—No. 8916. "Improved Attachment for Camera Stands." MARY FRANCES COTTON.

-RAY TUBES.—No. 8998. "Improvements relating to X-ray Tubes." ALFRED CHARLES COSSOR and WILLIAM UNDERHILL HILLIAR.

ACKING FILMS.—No. 9055. "An Improved Method of separating Flexible Photographic Films, Cards, and the like." WALTER GEORGE PERKS and HENRY GEORGE MERRICK FLETCHER.

-RAY WORK.—No. 9076. "Improvements in or relating to Mercury or Mechanical Interrupter for Induction Coils in connexion with X-ray Work." HARRY WILLIAM CHARLES COX.

ILMS.—No. 9120. "Improvements relating to the Manufacture of Photographic Films." (La Société Anonyme des Pellicules Françaises, France.) Complete specification. WILLIAM EDWARD EVANS.

INEMATIC PICTURES.—No. 9291. "Improvements in the Production of Cinematic Pictures and in Apparatus for viewing the same." AUGUSTUS ROSENBERG.

Correspondence.

* *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

* *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHY AND THE FOURTH COMMANDMENT.

To the EDITORS.

GENTLEMEN,—Many of your correspondents in the Fourth Commandment discussion appear to object to Sunday work. Now, I take that it is necessary to take photographs on that day, for in many cases it is the only day that people can avail themselves of, owing to their occupation. I know a firm that often "takes" forty people on a Sunday, and there are possibly many that could beat this. But I do not agree to seven days' labour, both from religious and business points of view. For the former one day a week at least is required for broadening the mind spiritually and otherwise, and from a business view no one, however opposed on religious grounds, can deny this: A person can do more and better work after an interval of rest than if they had not one; one is tired by constantly doing the same thing; whereas after a change of occupation one is fresh and can do more, which in the end pays the employer. It requires someone like Mr. Randall, whose article on the economy of labour appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY a few months ago, to clearly put this.

I do not do any Sunday work, but I cannot see why any employer cannot allow his employees one day's holiday a week (not necessarily all on the same day), which would be practically their Sabbath day; the Commandment does not mention any one day.

When seven days' labour is being employed, the people being photographed indirectly commit a sin (for they employ labour), whereas if the photographers only worked six days a week they would not, because the sitters would not be working themselves nor employing unlawful labour, and I do not see that the mere fact of their being taken that day could be a sin, for Christ said, "Man was not made for the Sabbath, but the Sabbath for man."—I am, yours, &c.,

DAY OF REST.

May 13, 1901.

To the EDITORS.

GENTLEMEN,—It is with great amusement that I have read the various letters that have appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY re the much-discussed question Photography v. the Fourth Commandment. I gather from what "J. H. W." states in his letter to you of the 10th inst. that he prefers to go without his meals on Sunday simply because he does not approve of his servants cooking, &c., on that day. Now, I think that that view of the subject is utter bosh. If "J. H. W." will read the above-mentioned Commandment he will see that it states, "For in six days the Lord made heaven and earth, the sea, &c., &c., &c., rested the seventh day," but it does not state which day was to be the seventh, whether it was to be Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, or Sunday.

How would it apply if a master gives his assistant or assistants a day off once a week, and then asks them to come on the Sunday? That assistant or assistants would then be only working six days a week. Could they (the assistants) go to church that day? There are plenty of Churches open on week days. I rather fancy that they would rather go to a place of amusement than a place of worship. I certainly do not see any harm in taking a negative on a Sunday, for there is an old saying, "The better the day the better the deed." But I certainly do not hold with printing, toning, &c., on a Sunday. But in these days there is so much competition, if you will not take a photograph on the Sabbath, others will. In my opinion there is no more harm in opening your studio on the so-called Sabbath than in having a good dinner on that before-mentioned day. I might also state that I am not an atheist. Far from that, but I should think that "J. H. W." must have the bump of religious mania largely developed.—Apologising for taking up your time.—I am, yours, &c.,

ALISTER SMITH.

Rhodesia, Station-road, Harpenden, May 13, 1901.

To the EDITORS.

GENTLEMEN,—I am glad that "J. H. W." is opposed to Sunday labour. I do not wish to misjudge him.

I must say, however, that the tone of his letters and his arguments are not conducive to retarding Sunday labour or getting a day of rest. In discussing the question of law and authority in the Scriptures, and their bearing on this subject, we must not forget that the wording of the law was suited to the need of the people at the time it was written. Therefore, in trying to understand how this same law applies to us (and we are expressly told it does, Matt. v. 17), we must try and understand the condition of the people for the immediate guidance, and for the rectifying of whose faults the laws were written, and then apply the same law to the evils of the present century.

Surely "J. H. W." does not mean to imply that either Christ or His Apostles suggested that the proselytes from the Jews were bound by the laws, and not the proselytes from the Gentiles? A proselyte, whether Jew or Gentile, originally was bound by the same law.

As for the controversy in Acts xv., referred to by "J. H. W.," this does not detract from the law. It deals with a Jewish custom. The words used are, "After the custom of Moses." Here we have a case of grown men, not babes, being asked to carry out a distasteful custom, which, in the event of their not carrying out, did not affect their spiritual welfare; therefore the decision of the Apostles was absolutely correct in reference to circumcision; but this decision has nothing to

do with altering the law of the Sabbath. As to the question which day shall be the Sabbath, that is absolutely immaterial; appoint any day you like (if we all agree to the same day, so much the better), as long as we keep to the spirit of the law and rest one day. The early Church deliberately selected a different day to the Jewish Sabbath; they did not break the spirit of the law in doing this. "J. H. W." says this is very suggestive; he does not say what is suggests. To my mind the change did not imply a free hand as to labour on the Sabbath. The change, probably, was effected because they did not wish, either themselves or their disciples, to be influenced by the traditions and customs which surrounded the Jewish Sabbath.

Christ's mode of keeping the Sabbath frequently brought on Him the charge of breaking the Sabbath. Yes, quite true; but take the actual cases, and see on what grounds and on what evidence the Pharisees formulated these charges, and Christ's reply to them. I need not go into each case, suffice to say every act was good and benevolent. He didn't break the law, but the traditions and customs that were added to the law, and which were a burden.—I am, yours, &c.,

136, Holland Park-avenue, May 10, 1901. H. EDMONDS HULL.

To the EDITORS.

GENTLEMEN,—Your correspondents who so manfully stand up and denounce Sunday labour are to be heartily thanked. I feel I cannot say anything more on the subject, except that I think Sunday labour is a disgrace to our trade, and trust that masters may soon see the benefit of observing the Day of Rest.—I am yours, &c.,

33, Whytehouse-mansions, Kirkcaldy. H. FISHER.

To the EDITORS.

GENTLEMEN,—While agreeing with your correspondents, "Six Days a Week" and Mr. H. E. Hull, that Jehovah commanded that the seventh day should be a day of rest from physical toil, I must dissent from what seems to be their contention, viz., that Sunday is the only day of the week on which believers should take that Sabbath rest.

We find that the Hebrews, before the captivity, generally employed the day in feasting and general recreation. During their residence in Babylon they came in contact with a people who regarded the day as set apart for special sacred ceremonial observance and fasting, and on their return to Palestine, Ezra the scribe, and others, gathering together the oral tradition and written documents relating to the Hebrews, revising same, and adding much of the ceremonial law and observances, which they had derived from the Babylonians, read it to the people, circa 458 B.C. as the book of the law, and to give it weight the whole of it was ascribed later to Moses. Then commenced the strict observance of the Sabbath, which reached its extreme height about the time of our Lord. "Knots might not be tied, nor fires lit or extinguished, no person must carry a burden, or climb a tree, or clap his hands, or ride a horse, or handle a weapon, a Sabbath Day's journey was restricted to 2000 cubits (or less than a mile), a broken limb or a sprained hand might not be relieved, and only help might be given in cases that threatened life." Part of the mission of Jesus was to show to the people that the priestly clique (who had altered the simple laws of God, and who had added all these and other matters to the law for their own purpose) were impostors, and did not truly represent His Father, and He informed them that "they had made the word of God of no effect by their traditions." He specially protested against their ideas on Sabbatarian observance and ceremonies, by doing many things contrary to their law. The priests, seeing that their living was in danger, and that it would touch their pockets if Jesus made many converts by his teachings, were indignant (even as the Ephesian gold and silver-smiths were under similar circumstances in later times), and, being well organized, did not rest until they had Him removed. So much for the Jews. The Galatian Christians had begun to observe days, and months, and years (Gal. iv. 10), and Paul reproves them for so doing, and asks them if they wish to come again under the yoke of the law, from which they had been delivered? The early Christian Church generally met together for the purpose of mutual help, prayer, and feasting on the first day of the week. This was their day of leisure, for many of them were in humble circumstances, and they could only get away from their pagan masters (who worshipped the sun) on that day. It was merely a coincidence that the resurrection was alleged to have occurred on that day. Afterwards, when the Christian community had increased in numbers and influence, the sun-worshipping Constantine thought it would pay to profess himself a Christian, and thus get this rising religious body on his side; this he did, and to make things easy for the pagan priests and people, he not only altered the Mithraic feast day of the winter solstice, "Dies natalis solis invicti," *i.e.*, "The birthday of the unconquered Sun" (which was held on the 25th December) into the birthday of Jesus, and transformed the spring festival into Easter, but he issued an edict, 321 A.D., "Let all judges, artificers, and inhabitants of the cities rest on the venerable day of the sun." Since then Sunday has been fixed as the day of rest. I have thus endeavoured to show that the law relating to the first day is a human, and not a divine institution, and that we have no Scriptural authority to call it exclusively the "Lord's Day." Paul in Romans xiv. verse 5, says, "One man esteemeth one day above another, another esteemeth every day alike, let every man be fully persuaded in his own mind." Verse 12 says, "So then every one of us shall give account of himself to God." Verse 13, "Let us therefore not judge one another any more, but judge this rather that no man put a stumbling-block or an occasion to fall in his brother's way." Jesus, when asked as to the Commandments, reduces them to (1) a belief in and love of God, and (2) to love thy neighbour as thyself (Matt. xxii. 36 to 40). I think, therefore, that "Jesus the Christ" and the Apostle Paul show very conclusively that a believer can set an day apart to the Lord for himself, if he so wishes, and he has no right to force his brethren to follow his example. Thus if A thinks it is right to close his establishment on Sunday, and makes it his Sabbath (or rest day), he is quite at liberty to do so, equally so with Z, who keeps open the whole seven days, and takes his rest day, say on Monday, and allows his assistant to do likewise on Tuesday. A and Z will both carry out God's command to work only six days, and at the same time do his duty to his brother.—I am, yours, &c.,

Ramsgate. BENJAMIN BRIERS.

To the EDITORS.

GENTLEMEN,—I did not intend to trespass further on your space, but the correspondence in the last number calls for a brief notice.

The "first followers of Christ" who rested on the Sabbath "according to the Commandment" were Jews, and the injunctions quoted by "D. K. W." were also to Jews.

If your correspondents will refer to Exodus xxxi. they will find it stated (verses 16, 17), "Wherefore the children of Israel shall keep the Sabbath, to observe the Sabbath throughout their generations for a perpetual covenant. It is a sign between me and the children of Israel for ever." What would become of the significance of the sign if it was intended to be made universal?

"Excelsior" alludes to the Fourth Commandment as the "oldest in existence." He, of course, falls into the frequent mistake of assuming that because the seventh day's rest is mentioned in Genesis ii. it was observed from the beginning. There is no trace of any such law under the patriarchal dispensation, and the compilers of Genesis would hardly have omitted to record its observance if it existed. The first reference to the institution as a law is in Exodus xvi., and the account shows clearly that the children of Israel did not understand it until it was explained to them, and the word "remember" prefixed to the commandment subsequently given emphasised the observance of the new law. Nehemiah (9th chapter) gives a record of God's mercies to Israel, and in its proper chronological position states the fact, "and gavest them right judgments and true laws, good statutes and commandments. And madest known unto them thy holy Sabbath" (see verses 7 to 15).

"Excelsior" fails to recognise the difference between a "moral law" and a "positive precept." Murder would be a crime even if no commandment against it was ever given; working every day would not unless forbidden by a competent authority.—I am, yours, &c.,

May 10, 1901. J. H. W.

To the EDITORS.

GENTLEMEN,—I am pleased to see the above topic taken up so well, and handled in such an able manner. I am sure that all those who oppose seven days a week business, &c., will feel very grateful for your kind assistance in this matter. It would, indeed, be a blessing if, as the outcome of this correspondence, a Photographic Assistants' Union should be formed, to preserve one day a week as a day of rest and private life improvement.

My definition of "imperative work" is "work which cannot be left undone without harm to life or soul." Food for body and for soul is "imperative," though it is left to the individual conscience considerably to decide what is "imperative," and conscience is too often lulled to sleep or smothered, but, whether asleep or dead, the Fourth Commandment is not, and transgression of that is sin.

I see "Excelsior" goes down to the root of the whole matter. Christ says, "If ye love me ye will keep My Commandments." Paul says "the carnal mind is enmity against God," and, of course, His Commandments.

I would like to point out to "J. H. W." that the Fourth Commandment is not my "theological notion," but God's law, and I only refer to such as do not keep God's law, or try to understand it, as "atheists, nominal Christians, &c., &c."

The passages of Scripture quoted in the various letters are sufficient authority and proof that Sunday business, &c., is transgression of the Fourth Commandment, if not to "J. H. W.," at least to the unprejudiced reader, therefore I see no necessity to wander off into abstruse argument, which would occupy much space and time, and be useless in the end. Could not some reader with the time, ability, and enterprise necessary, form a union as I have suggested, and charge an

nnual fee for membership to defray expenses, and thus photographic ssistants would combine to uphold the principle and benefit of

SIX DAYS A WEEK.

[The foregoing letters must close a correspondence which has provoked a volume of Biblical quotation and argument, not perhaps, ssential to the discussion of the main point—that of Sunday labour n photography—although we recognise the difficulty that is felt in nost cases, of viewing it in a legal or moral as distinguished from a urely religious aspect. The first letter on the subject appeared so ar back as April 5, and the writer, "Six days a week," protested gainst assistants being required to work on Sundays. He added: 'Many men and women are accepting seven-days-a-week appointments o escape being left among the 'great unemployed;' but more hame to the avaricious employers, and to the indifferent Government or not enforcing good laws. It is a recognised fact that seven days' work a week is injurious to mind, body, and soul. . . . Looked at in common sense, employers ought to desist for their health's sake; but f they will not, then let us form an association to protect the somewhat defenceless employees." It is obvious, however, that Sunday abour does not necessarily imply seven days' work a week; and the contributors to the discussion have mostly ignored the fact that 'Six days a week," unconsciously, no doubt, submitted these two listinct questions for consideration. But to sum up: Sunday labour n studio photography, in our opinion and according to our experience, is seldom necessary, rarely urgent, and never imperative; and n the best interests of employers and employed should be abolished. The greater evil, including the less, is, of course, seven days' work a week, an indefensible cruelty. Dead-letter laws and the impotence of masters and men block the way to the removal of this reproach to photography; but the matter is obviously one that comes within the scope and power of the newly formed Professional Photographers' Association to handle, and we hope to see it done.—EDS. *B.J.P.*]

KODAK, LIMITED, AND THE TRADE.

To the EDITORS.

GENTLEMEN,—We are instructed by our Committee to send you the enclosed copy of a resolution passed nem con. at a meeting held this evening, and to request you to be good enough to publish the same in your next issue.—We are, yours, &c.,

The Joint Hon. Secs., per A. H. DOWSEY.

Camera Club, Goldsmiths' Institute, New Cross, S.E., May 13, 1901.

"That the Committee of the Goldsmiths' Institute Camera Club hereby expresses its entire disapproval of the late action by Kodak, Limited, as altogether opposed to British ideas of liberty and free trade, and strongly recommends all members of the Club to abstain from purchasing any Kodak productions whatsoever until the present unwarrantable restrictions are removed."

To the EDITORS.

GENTLEMEN,—In the Kodak Trade Circular for May, 1901, there are a number of misleading statements which my Executive consider they cannot allow to pass without entering a protest on behalf of this Association.

Kodak, Limited, assert that the agitation now being carried on against their new conditions of trade is being fostered by outsiders for their own personal ends. This is entirely without foundation. The objection to their new conditions originates from a large and representative body of the principal photographic dealers, both wholesale and retail, and is solely and entirely directed against the principle of trade therein involved, and not in the personal interests of any individual. On the first announcement of their new conditions of sale, the strongest objections were taken to them by the leading members of the trade throughout the country, supported by an overwhelming majority in the negative in a written reply to the question, "Do you or do you not approve of the new conditions of sale imposed by Kodak, Limited?"

The non-approval is still further supported, as you well know, by the photographic and public press, and, lastly, and not less strongly by the opinions that have been, and are being daily expressed, by the photographic societies and amateur photographers generally throughout the country.

As the company in their circular "assure their dealer friends that they wil not go against the evident desires of a preponderating number of those interested," it is difficult to see why they should persist in their new and objectionable conditions, especially as the bulk of the trade are against them.

They further argue that if they withdraw the new conditions, they must also withdraw their other conditions as to selling their specialities at fixed retail prices by the trade. My Executive fail to see why the conditions as to underselling are contingent upon their endeavour to establish a monopoly in their specialities, and why, if necessary to them in the case of rollable films and cameras, it should not be so in regard to the photographic papers they sell?

Having already taken credit for the beneficial effects of their conditions restraining underselling, it now seems a curious policy to say that if they do not get their own way in this new imposition, they will withdraw the restrictions which they have shown to be beneficial to themselves, and to their trade agents. It is quite worthy of their consideration that such action would still further alienate the good will of at least a large portion, if not the bulk of the trade.

With regard to the company's remarks on co-operation and monopoly, they must be well aware that it is not so much a question of co-operation as of meeting the public demand on the part of any one professing to stock photographic requisites, should they fail to supply and stock rollable film cameras and films. The question is solely whether the trade shall submit to shut out all further improvements, and give up their right of free and open trading and competition. In effect, what Kodak, Limited, say is, you must either refuse to supply our speciality when asked for, or refuse to supply anything of a similar character which the public may consider an improvement.

The company's arguments, under the head of "Agitators" appear to be beside the question at issue. The press, the rival manufacturers, and the wholesalers have the same end in view as Kodak, Limited, say they have, namely, to support the real interests of the photographic trade. It would not be difficult to give an overwhelming answer to the company's questions as to what these several branches of the photographic trade have done, and are doing, for the dealers and the trade generally; but, it may be asked in return, what right they have to assume that they alone have been working for the advantage of the dealers, or have such a preponderating share of the trade? However popular they may have made their principle—"You press the button and we do the rest"—can it be doubted what the verdict would be if Kodak, Limited, or any one were to take a poll of, say, the photographic societies of the United Kingdom as to whether film cameras or plate cameras are preferable for any one working for the love of, and in the true interests of, the photographic art?

At the last general meeting of the Association, a resolution was unanimously adopted, recommending all dealers to ignore the prohibitive conditions imposed by Kodak, Limited, and a guarantee fund was inaugurated and largely subscribed to, to contest any action against a member as the result of this recommendation. This recommendation has already been largely acted upon. Several dealers have given the company notice that they will not agree to their conditions, and others have refused to accept goods on the conditions stated on the invoice without the company having stopped their supplies. Whilst the Association recommends resistance at all costs to the obnoxious conditions, they still hope that Kodak, Limited, will, in face of the strong expressions of opinions daily accumulating against them, withdraw their new conditions without reserve, and rely upon the quality and price of their specialities to meet competition and improvement.—I am, yours, &c., J. BROOKE WILKINSON, Secretary.

The Photographic Trade Association, 89, Farringdon-street, London, E.C., May 14, 1901.

To the EDITORS.

GENTLEMEN,—I enclose a copy of a letter sent by me to Kodak, Limited, in reply to a letter sent to our President, in almost identical terms of that published in your columns.

Mr. Maclean has probably sent you a short account of the meeting of our club, but if space permits I shall be glad if you can insert the enclosed, either in whole or part.—I am, yours, &c., ERNEST SALT.

106, George-street, Croydon, May 11, 1901.

"The Croydon Camera Club, May 8, 1901.

"To F. C. Mattison, Esq., Assistant Manager, Kodak, Limited.

"Dear Sir,—Your letter of the 1st to Mr. Hector Maclean, the President of our Club, together with a copy of the letter issued to the photographic press, have been read by him to the members at a general meeting held this day, and they have directed me to say that, after a careful consideration of their contents, they do not see their way to accede to your request by rescinding the resolution passed on the 17th ult., nor can they agree with you that such was passed under a misapprehension of the facts.

"You appear to overlook that a large number of your agents have established a remunerative business in Kodak goods, and that a refusal of your new conditions would involve them in a serious pecuniary loss. It cannot, therefore, be said—except in a very restrictive sense—that 'they are free to decline the contracts.' The fact that they will still be able to purchase your goods at retail prices, and sell them without profit, does not, in the opinion of our members, seem to be a very satisfactory alternative.

"They, moreover, do not by any means consider all the rollable films on the market imitations of yours, some being radically different in principle and construction. A few manufacturers may, to use your

term, 'associate' their products with Kodak, Limited, but, as you are perfectly well aware, no dealer could represent them to be of your manufacture and sell them as such without infringing the law. Thus there can be no confusion in the mind of the purchaser as to what he is buying.

"I am also requested to say that the members see nothing in your letter to the detriment of 'The Free Camera Club.' They have no curiosity as to 'who pays its expenses,' nor are they aware it claims to be in the nature of a philanthropic institution. They fully believe in the bonâ fides of its Hon. Secretary, and in that of the Editors of other photographic publications who have severely criticised the action of your company.

"Whether the removal of the present conditions must necessarily mean an era of cutting prices, the members of our club do not feel competent to express an opinion upon. They finally wish me to convey their regret that Kodak, Limited, should think it necessary to employ coercive measures in an endeavour to minimise competition, and they feel sure that if the restrictions are withdrawn it will in no way affect the interests of the company, and will restore the confidence and friendly feeling which up to the present has existed between it and its customers and agents.—Yours faithfully, "ERNEST A. SALT, Hon. Sec."

To the EDITORS.

GENTLEMEN,—Would you kindly insert the following in your next issue?—I am, yours, &c., A. G. THOMAS, Hon. Secretary.

At the Darwen Photographic Association, on the 2nd inst., the following resolution was unanimously adopted:—"That this meeting desires to express its strongest disapproval of the action of Kodak, Limited, in interfering with the freedom of the dealer, as opposed to British ideas of fair play, and can only regard the company's action as an attempt to establish an injurious monopoly."

KODAK, LIMITED, AND THE TRADE.—WHAT ABOUT THE PUBLIC?

To the EDITORS.

GENTLEMEN,—The letter from Mr. Green is very refreshing, and quite worthy of such a signature. It is characteristic of the monopolist, who only sees the value of "freedom and independence" when his own interests are threatened. He is quite prepared to stand by fair prices, which, of course, means the list prices, by which he hopes "to attain to a position of honourable affluence and independence" in a few years. The trade may be tyrannised over by an association giving him this protection, but when another organization dictates that he must not sell certain other goods, because they are inferior, or (may I say it?) cheaper, he grows indignant. What is the difference between the dictation of Kodak, Limited, and the Plate-makers' and Manufacturers' Association? Kodak refuses discounts if other kinds of rollable film are sold, and the Association refuses to supply any one who sells below the price list. In both cases the right of the individual to conduct his business as he pleases is infringed. Kodak claims this right, but denies it to the dealer, and therein lies the inconsistency of its position, as well as that of every other trader or association enforcing restrictive principles. The first step to bondage was taken when the dealers accepted "the ring" a few years ago. Kodak's demand is only an extension of the system. If it succeeds some large firm of plate-makers may next refuse to give discounts to dealers trading in other kinds of plates. The opticians, camera-makers, and other branches of the trade may follow. We shall then see Kodak Stores, Universal Dry-plate Stores, Vaterland Optical Stores, and what not. All these concerns will exist by selling at fair prices, and the public will have the privilege of trotting round to collect its photographic material, and likewise of paying for it.

When Mr. Green drops protection, in so far as it answers his purpose, I shall be in sympathy with him. Meanwhile I shall enjoy the fun of the fight.—I am, yours, &c., PHOTOGRAPHER.

SMOKE AND BUBBLES PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—The subjoined letter, taken from the "Edinburgh Evening News," of Saturday's date, is, I think, worthy of reproduction, as showing how even the public are finding out the "Smoke and Bubbles" game.—I am, yours, &c., G. BRODIE.

Aberdeen, May 6, 1901.

"TWENTIETH CENTURY ADVERTISING.

"'Victimised' writes: For some time past advertisements have appeared in many papers from an enterprising firm, offering to give a dozen copies of any uncopyrighted photograph in exchange for 2s. 6d. and a dozen wrappers of their particular wares. As a photographer of some experience, I was curious to know how this could be done, as the offer seemed to indicate that ordinary snap-shots would be enlarged to about cabinet size. I wish to warn your readers against being taken in by such advertisement. The advertisement says that the photograph and mount combined will measure cabinet size. That is perfectly true, but taking the square inches of each, there is an oasis of seven and a half square inches of photograph in a desert of over 29 inches of mount. Although the original quarter-plate sent to be copied was beautifully clear, and was as perfect as any I have taken in my eleven years' experience of photography, the copies sent, cut down to $2\frac{1}{4}\times3\frac{1}{4}$, were hopelessly blurred and out of focus, in fact, altogether useless. On my pointing out this to the firm, they declined either to send copies or to return the money sent them, and also refused to allow the Secretary of the Edinburgh Photographic Association to arbitrate as to the correctness of the statements made in my letter. A professional photographer has told me that these reproductions can be turned out, using a battery of small lenses, at an outside cost of one shilling a dozen; being the owner of the plate, I know that I could produce twelve copies of the original at about the same price. So far from the offer being a partial bonus to consumers of the firm's goods, the transactions should represent a profit, after deducting postage, of about 130 per cent., and while the owners of cabinet photographs might expect to get a reproduction of the same size, judging from my experience, they would find themselves landed with a dozen small and blurred reductions, which are absolutely not worth the $2\frac{1}{2}$d. they would cost to return, much less the 2s. 6d paid for them. I have pointed out to the firm that if the advertisement was not deliberately intended to be misleading, why is the actual size of the photo itself not advertised, and not merely the size of the mount. To this I have had no reply. I may say that my offer regarding the arbitrament of the Photo Society Secretary, or of any professional in Edinburgh, is still open."

NOTES ON OLD LENSES.

To the EDITORS.

GENTLEMEN,—As Dr. von Rohr is not amongst us, and may therefore not supply prompt correction, will you allow me to point out that the diagrams in his paper in your last issue appear to have been transposed in making up. No. 1, on page 293, should take the place of No. 2, as Grubb's aplanatic, described on the following page. Some readers not acquainted with the instruments may feel confused as matters stand.—I am, yours, &c., W. E. DEBENHAM.

May 11, 1901.

[We thank Mr. Debenham for kindly drawing attention to this matter, and trust that our friend Dr. von Rohr, as well as our readers, will forgive the unfortunate transposition of the diagrams illustrating the Chevalier lens and Grubb's aplanatic. It is the fashion to ascribe such oversights as this to the printers; but in the present case no blame attaches to them.—EDS. *B.J.P.*]

DR. GRUN'S LENSES.

To the EDITORS.

GENTLEMEN,—In your last issue Mr. Ferrars asks where infinity begins with Dr. Grün's lenses, working at apertures of f-0.84 and f-1? As Mr. Ferrars does not mention any particular focus, the formula is given. Let f=the focus, c=the circle of confusion allowable (mostly 1-100 in.), and s=the ratio of focus to stop, e.g., in a R. Rectilinear working at f-8, s=8; then infinity begins at a distance equal to $\frac{f\,(f+sc)}{sc}$

This gives for a 5 in. lens at f-0.84, a distance of 248 ft., and at f-1 208 ft. approximately, the error being only $4\frac{1}{2}$ to 5 inches, which is infinitesimal. Hoping this will be of service to Mr. Ferrars.—I am, yours, &c., F. P. EVERITT.

May 11, 1901.

THE TEACHING OF PHOTOGRAPHIC OPTICS.

To the EDITORS.

GENTLEMEN,—Under the heading of "Photographic Optics," in your issue of May 3, Mr. W. B. Coventry has drawn attention to a subject that I have been on the point of writing about for some weeks past, viz., the confusion that exists with regard to what the average photographer is to understand by "depth of focus," but not being a profound mathematician and realising how deep a question it is, I remembered that often "fools rush in where angels fear to tread," and hesitated.

Even now I feel great diffidence in approaching such a subject, especially in the wake of so capable a gentleman as the author of "The Technics of the Hand Camera" must be; but, believing with Queen Elizabeth that "he who fears to fall should not climb at all," I should like to point out that the dicta on this subject, as published by Messrs. Dallmeyer, Goerz, and other lens makers in their various pamphlets and introductory remarks to price lists, &c., state that "depth of focus depends on no particular form of construction, but solely on the ratio between the effective aperture and focal length, and upon the absolute value of the focal length itself," and they then proceed to say that

depth increases in proportion as the ratio between the aperture and al length decreases, and as the focal length itself diminishes. Now, hout wishing to question these statements, which, from an optician's nt of view, are doubtless correct, it seems to me, looking at it m the point of view of the average photographer, who has not time, n if he had the inclination, to go very deeply into optics, that if the ious lens-makers were to state that, though depth of focus in a lens did depend on the theoretical construction of any particular type of lens, t it was a variable quantity, together with the focal length dent on the mechanical as distinguished from the theoretical con- uction, I think it would go a long way to enable photographers to derstand why the depth of focus does vary in different lenses, not- thstanding the statement that a lens has no depth, and which state- nt is, in itself, a very confusing one. I do not know whether I have de my point clear, or even if I really have one, but I must say that . Coventry's explanation is the first one that has enabled me to derstand what I have always looked upon as conflicting statements. may, of course, be through lack of sufficient knowledge of the sub- t, but I thought the views of a photographer anxious to grasp this int would not be altogether out of place, if you can find room for em in your valuable JOURNAL.—I am, yours, &c.,

Fife-road, Kingston, May 7, 1901. H. W. NEWTON.

A MISSING CAMERA AND KITE.

To the EDITORS.

GENTLEMEN,—We have pleasure in enclosing herewith a copy of the nslation of a letter we have received from Mr. Delcourt, of Berck, d shall be glad if you will kindly publish it in THE BRITISH JOURNAL PHOTOGRAPHY. You will notice that Mr. Delcourt, on April 25, nt up a kite to which was attached a camera, and has not heard ything of it since. Possibly the publication of this letter may help m in the recovery of it.—We are, yours, &c.,

THE THORNTON-PICKARD MANUFACTURING CO.

Altrincham, May 7, 1901.

To the Thornton-Pickard Manufacturing Co., Lt., Altrincham.

Gentlemen,—Last year a kite started from Berck bearing my name d address, and turned up at Burmarsk, Kent. This year, on April , a kite—this time without address—carrying at a depth of 400 meters camera fitted with one of your aluminium shutters, started in a .N.W. direction, *i.e.*, following the English coast-line, supported by 00 metres length of string dragging in the sea. As your name alone ured on the apparatus, it is probable that if found anywhere you ll be apprised of the fact. I should like to know if this is the se? I take this opportunity of congratulating you on the excellence your shutters (supplied by Messrs. Demaria Freres). They have ven me complete satisfaction.—Yours faithfully,

M. DELCOURT.

Chalet Lucette, Berck s M, Pas de Calais, May 5, 1901.

PHOTOGRAPHERS AND THE GLASGOW EXHIBITION.

To the EDITORS.

GENTLEMEN,—The Glasgow Exhibition will have its due effect on the notographic industry. A large percentage of the visitors will be quipped with hand cameras, and, after the Exhibition itself has been xplored and inspected, a large number of the visitors will journey to me of the many beauty spots for which Scotland is famous.

Doubtless every facility will be given in the way of railway transit; ut for those who have the time, the best way to reach Glasgow is by ater. The change and the sea breezes are bound to prove beneficial, nd then the camera worker will have the advantage of traversing the hames and the Clyde. This will provide him with plenty of choice aterial, so that for the extra time spent on the journey he should be mply repaid.

There is one delightful tour which should be made, if possible. hose readers who can afford the time, and have not yet been over ie ground, should certainly consider it. Starting from London, journey Glasgow by water, *i.e.*, round the South Coast, calling at Belfast. ubsequently after duly inspecting the Exhibition, journey to Storno- ay. Return to Glasgow, and book for Queensferry, to inspect the orth Bridge. From Queensferry go on to Edinburgh, some eight miles istant. And from Leith, the port of Edinburgh, you can return to ondon by boat. In this circular tour, briefly mapped out, some of ie most beautiful scenery to be found in these islands would be seen.

The journey from Glasgow to Stornaway by water is a delightful one. he rugged grandeur of the western islands of Scotland, and the harming atmospheric effects to be seen, are very beautiful. Several rief stoppages are made at various points on the mainland before tornoway is reached, and the tourist is given an opportunity of visit- ng Lake Maree, a short distance inland.

Visitors to the Exhibition should, if possible, certainly journey to Queensferry to inspect the magnificent Forth Bridge. For permission o walk over the bridge, application must be made to the resident engineer. The panoramic views presented from the bridge are very fine, and the country in the vicinity is interesting. Lord Rosebery and Lord Hopetoun have their Scotch homes in the immediate vicinity.

Some days might very well be spent in Edinburgh, for there is much to see.

The writer will not occupy space in endeavouring to describe in detail the interesting and beautiful country comprised in the above tour, but intending visitors will find the ground admirably dealt with in the North British Railway Guide (published by Messrs. Jack, Edinburgh) and "Summer Tours in Scotland," issued by David MacBrayne, of Glasgow. These guides are sixpence each, and they will prove indispensable to those who intend visiting some of Scotland's famous beauty spots. The latter guide is copiously illustrated, and both contain maps.—I am, yours, &c., J. A. REID.

Cutcliffe-grove, Bedford.

AMERICANISED.

I LOVE my Transatlantic brother well,
I hate his foes infernally;
With conscious pride I feel my bosom swell
When he greets me fraternally.
Yet might it not, I sometimes ask, befall
That his loved presence might begin to pall?

His Kodak on my privacy intrudes,
His beef fills to satiety,
His canned goods crowd what late were solitudes,
His heiresses Society.
'Tis his —one drop of sweet in bitter cup—
'Tis his alarum wakes my servants up.

His oil my lamp, his corn my belly fills,
He builds me my machinery,
And boards that tell the praises of his pills
Adorn my native scenery;
While in the Tube—so Yankeefied we are—
I ride perforce in his triumphal car.

He wins our races, teaches us to ride—
'Tis true, I'm very sure it is—
Our markets find all stocks are dull beside
His versatile securities;
And near at hand, I hear, the period is
When all our ships and shipyards shall be his.

He fills my kosmos, and I can but see.
As every Tom and Jerry can,
Soon I, my kin, race, clime and land may be
Essentially American,
And I may own, of comfort quite bereft,
That there is nothing really English left.

M. S. in "The Daily Chronicle."

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED:—

E. E. Lippiatt, 2, Church-terrace, Leamington. *Photograph of interior of All Saints' Church, Leamington.*

DEVELOPING MARKS.—"BEGINNER."—The markings on the negatives sent are due to the dish not being kept rocking while the plate was developing. The remedy is obvious.

LADY RETOUCHER.—"The Moniteur de la Photographie" is the best medium for advertising, but we doubt if our correspondent will find it easy to secure a suitable situation in Paris.

J. W. NEWALL.—The quantity of sulphite in the formula quoted is far too great. We imagine that an error has crept in, and we will bear the matter in mind for correction in the next ALMANAC.

STUDIO BLINDS.—"SHAMROCK" wishes "To ascertain colour of blinds most suitable for studio with northern aspect?"—In reply: Light blue or pale green will be very suitable for that aspect. Or white will suffice, but we should prefer the former.

R. S.—(1) There is but one Tanquerey, we are pleased to say, and the circular sent comes from the notorious establishment in Paris. (2) Where not otherwise specified the crystallised and not the anhydrous salts are generally meant in photographic formulæ.

Platinotype Printing.—"Puzzled" writes: "Would you kindly let me know what you think is the cause of the enclosed mealy platinum prints?"—In reply: So far as we can judge, from the prints, not having seen them produced, we should say there was a scum on the bath when they were developed. They have very much that appearance.

A. Baker (Burton-on-Trent).—The reason your paper does not print the same colour as the commercial papers do is that you have not prepared it in the same way. Those who make the commercial papers, of course, do not publish the formulæ by which they work. They have arrived at it by a long series of experiments, and if you wish to make a paper equal to that you will have to make a series of experiments also.

Baryta Paper.—"Collodio-chloride" writes: "I intend experimenting in the manufacture of collodio-chloride and P. O. P.'s, and, if successful, intend to put the paper on the market. Can you tell me where I can procure the baryta paper here? I am told it is made only in Germany, but I should prefer to buy it here if possible, and in small quantities at a time."—In reply: Messrs. Otto Kônig, Cross-street, Finsbury, are the English agents for it. But whether they supply it in retail quantities, or not, we are not aware.

Packing Gelatino-Chloride Opals.—J. J. Smith writes: "Will you kindly infom me what is the most suitable paper used for packing gelatino-chloride opal plates? The paper I have been using is not chemically pure and marks the plates."—In reply: It is difficult to say, with modern papers, whether any will not have an influence on the plates without experimenting with them. Even then it is possible that no two samples are alike. The most chemically pure paper to be obtained is the Swedish filtering paper as used by analytical chemists, they may be relied upon. Would it not do to pack the opal plates as ordinary dry plates are packed?

Candid Opinion Invited.—"Inquirer" writes: "Enclosed please find two prints, I want you to give me your candid opinion about them. I have finished them myself from beginning to end, including retouching; they are somewhat about the average of my work. They have been taken in an attic with one top light about a yard square, and with a 50s. camera, having a landscape lens. I should like to get a situation in a studio as an assistant, and I want you to tell me whether you consider my work good enough for me to apply for one, and, if so, about how much am I worth per week? The other untoned prints are from negatives I took in a studio (a friend of mine) with his camera."—In reply: As you ask for our candid opinion we must tell you that we do not consider the work at all good, and we should advise you to persevere and improve yourself in lighting, posing, and retouching before applying for a situation.

Platinotype Printing —"Sepia" writes: "I herewith enclose two sepia platinotype prints, No. 1 of a warm tone, No. 2 of a cold. No. 1 is made on rough sepia, and No. 2 on ordinary 'S.' No. 1 was developed with the special solution formerly supplied by the Platinotype Co., but which they have now ceased to supply. No. 2 was developed with their special sepia salts. I may say that the same result as No. 1 can be obtained with ordinary 'S' paper and the special solution, but I send you the 'R. S.' print, as I have not an 'S' print at hand. What I desire to ask you is, (1) Can you give me the formula for the special solution? and, if not, (2) Can you inform me how the tone of No. 1 can be obtained in the absence of the special solution?"—In reply: (1) We regret we are unable to give you the formula for the old "special solution," as, we believe, it has not been published. (2) If you will write to the Platinotype Company they will probably be pleased to supply you with the desired information.

Pyro Developer Troubles.—H. R. writes: "Lately I have had much trouble with my pyro soda developer, as made up according to the Ilford formula. (1) How long should the stock solution keep in a good condition, more especially the soda solution? My trouble is in the appearance of black spots, some rather large upon my negatives, as soon as they have been cleared in the hypo. (2) Is it absolutely necessary to use distilled water in making up the solutions? (3) Is the pyro soda developer considered in any way superior to the pyro ammonia one? I feel very much inclined to throw up the soda developer entirely. (4) As a rule, I find that it works all right when perfectly fresh, but the spots come when stock solution is a week or two old. Should the bottles with stock solutions be kept corked up? I may say I have filtered the soda solution to arrest any particles that there might be through filter papers, and still the spots appear."—In reply: (1) The stock solution of pyro will keep good for many weeks, and that of the soda for many months—almost indefinitely. (2) No; water that has been boiled answers every purpose. (3) One is as good as the other. It is quite a matter of opinion which is the best. Some plates, however, work better with the soda developer than with the ammonia one. (4) Yes, certainly. We think that you must seek for the cause of the spots to some other source than the pyro developer.

Hypo.—If the ounce of hypo solution, 8:20, be made up to 2¼ ounce it will reduce the strength sufficiently closely for all practic purposes for which hypo is used.

Ignorant. — The following conversions will be found sufficiently a curate for your purpose:—Distilled water 35 ounces (fluid), hyp sulphite of soda 7 ounces (solid), acetate of soda, 308 grains, a tate of lead 230 grains, gold solution 1 ounce 6 drachms 5 minim But you will perceive that the quantities work out somewhat aw wardly. In reality it is simpler and easier for you to use metr weights and measures.

The Blue Process on Wood.—"Searcher" writes: "I should be muc obliged if you could give me the method to utilise the blue pr cess (ferro-prussiate) for printing on wood. A certain article photographed, and from the negative I want to be able to prin on the boxwood, so that the wood engraver can follow the phot graph exactly. Thanking you in anticipation of your reply." In reply: We know of no blue process that is specially adapted fo that class of work. However, in our volume for 1899, there is series of articles on "Iron Printing Processes" (see pages 29 312, 327, 345, 362), one or other of which you will probably b able to adapt to your purpose.

Studio-building.—"Studio" writes: "You were very good enough t give me your advice on studio-building. May I trouble yo further? (1) Would it make any difference in the measurement of the studio I sent last week if the width of studio was in creased to sixteen or seventeen feet, and, if so, in what way (2) Do I understand that the papering of studio should be pal green as well as the paint work? (3) In what way do you re commend the blinds to work, and on what system? At presen mine work from bottom to top on wires, as you will see by en closed photograph — width of blinds thirty-nine inches; blind worked with cords from the top. Is the width right? (4) Ca you give me the address of Avery, makers of studio blinds? (5 Looking up to the end of studio it runs E.S.E. (see photograph) has this a tendency to affect the lighting of subject, and, if so which way should it face, or the next best way? (6) The width o glass on the roof and sides is sixteen inches, would you consider this a correct width? (7) I have an exterior photograph of a old manor entrance and steps. I wish to have a backgroun painted from same and steps made, but I also wish to register design. Can you tell me how to proceed to protect my design and idea: would I have to register the photograph itself, or a photograph from the background when it is painted? (8) What lens would you recommend for the best all round studio work combining groups and landscape, or for all round studio work alone, to cover a fifteen by twelve plate with a large stop?"—In reply: (1) We did not retain the sketch sent, and do not quite remember what it was. (2) Any light and pleasant colour will do as well as pale green, it is more a matter of taste than anything else. (3) The system as shown in the photograph is admirable. (4) 81, Great Portland-street. (5) The lighting seems to be under perfect control by the blinds. (6) Yes. (7) Register a photograph of the background with a description of what it is. (8) Either a lens of the "group type" or one or other of the anastigmatic working at about *f*-6, and about from twenty to twenty-four inches focus.

Stripping P. O. P. from Glass.—W. Cooper writes with reference to a difficulty in stripping prints from glass: "Since I obtained the supply of glass (a portion of which these were put on to be enamelled), I suffered from the prints sticking, sometimes the whole of the pieces being stuck fast to the prints, and spoiling me the week's finishing. I find that after thoroughly cleaning the glass I have no difficulty for two or three weeks, but then the matter gradually gets worse. The thorough cleaning operations are as follows — First, soaked in dilute nitric acid followed by strong soda, then well washed. General weekly cleaning being: washed with leather, then polished with dilute ammonia and whiting (recommended by the papers makers), and finally rubbed with beeswax in benzine, Now, it is obvious that to go through all the processes weekly is a big job, and, what is more, I have two pieces of plate that do not require such treatment, but which work admirably by the usual cleaning and waxing. I should quickly obtain more glass, but this is the second lot I have got, so as to have a good supply, that has turned out faulty. I have experienced like difficulty before, but it has been when the fixing solution has been newly-made, but that used last week had been made several days in advance. Further, I notice that in a preliminary rinsing to remove dust, &c., the water will run clean off the good glasses, while on these faulty ones it will remain in places, and even on being reared upright leave markings on the surface similar to the torn places on the prints, leading me to the idea that there is something about the glass that I have not succeeeded in removing. The matter has caused me considerable loss and annoyance, and, as I have close on £1 worth of plate I am anxious to have it right, or, if new is required, to know what to purchase to avoid a repetition of the trouble?"—In reply: There should be no difficulty if the glass be moderately well cleaned, and then properly waxed and polished. We do not think the glass is in any way faulty. The fault, we should say, is in the waxing. After the prints are stripped off there is no need for again cleaning the glass, it simply requires rewaxing slightly. As a matter of fact glass, without recleaning, works better than that which is cleaned with acid, &c., every time it is used, and it is much easier to wax again, i.e., less trouble. Have you tried treating the glass with French chalk instead of waxing it? That involves less trouble.

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EX CATHEDRÂ.

Professional ographers' ciation.

We print this week the Rules of the newly-formed Professional Photographers' Association. They have approved by the Provisional Committee, consisting of twenty professional photographers, and show, we think, all necessary detail the lines upon which the Associahould be conducted to the best advantage of its mem-

A copy of the Rules, with a short appeal to join the iation has been sent to every professional photographer ngland, Scotland, Ireland, Wales, and the Channel Is-, whose address appears in the most recently compiled ory. If the rules and the appeal do not reach any idual professional, the reason will be obvious. His ss has not been ascertainable in the usual way. Membership, on the basis of these Rules, is, however, open to professional photographers, and if there are any of the who have not been addressed from the offices of the rary Secretary, Mr. Alfred Ellis, 51, Baker-street, on, W., will they be so good as to accept this present reference as an invitation to become members? It is the wish of the Provisional Executive to make the membership not merely large, but representative of the whole of the country. The more members and the wider the field they cover the lighter will be the task of the committee in working out the scheme of provincial centres. That scheme cannot be taken in hand until the responses to the committee's circular are in hand. The correspondence on the Ogden-Lever invasion in our pages a few weeks ago, and the subsequent meeting, brought us between two and three hundred applications for membership of a body which did not then exist; but now that the Association has been duly constituted, provided with rules, and has an executive which is prepared to carry out a District Centre scheme enabling photographers in all parts of the country to locally co-operate with the London centre of the Association, the membership applications should swell to thousands. The long-sought opportunity for British professional photographers to unite in self-defence, and for the safe-guarding of their important interests is now before them, and it should be embraced by every man who has the welfare of his calling and his own individual advancement at heart. It has been a pleasure to us to have had the honour of founding the Association; we have taken equal pride in presiding over the deliberations of the committee and sub-committee which have met to work out the original scheme in detail: and now that the Association is officially launched before the photographic profession, we shall endeavour in the best interests of photography to give it always a firm but discriminating support. Long life and prosperity to the Professional Photographers' Association!

* * *

The Municipal Technical School for Photographers, Berlin.

A report published in the "Deutsche Photographen Zeitung" gives some interesting particulars concerning the progress of this institution. During the five years it has been under municipal control, the number of students has risen from 41 to 89. In the winter of 1898-99 there appears to have been an exceptional influx of students, but for the other terms the accessions to the num-

ber have, with slight exceptions, been steadily progressive. The age of the students is an interesting feature in the report, and the following details are given for the summer of 1900 and winter 1900-1:—

Age—	14	15	16	17	18	19	20	21-30	Over 30
Summer, 1900 ...	2	7	8	9	9	2	4	14	7
Winter, 1900-1 ...	4	8	11	9	8	5	5	32	7

The old students are utilised as assistants and the following classification of scholars and staff is given for the last three terms. It speaks well for the efficiency of the school that so large a percentage of old scholars remain to continue their studies:—

	Students.	Assistants.	Teachers.
Winter, 1899-1900	30	28	3
Summer, 1900	39	21	2
Winter, 1900-1.....	47	39	3

Unfortunately, the report does not give any particulars concerning the financial results. It would be interesting to know the average receipts and cost per scholar, and how much the city of Berlin contributes annually to the school.

* * *

The Preparation of Developers. The "Bulletin de la Société de Lorraine" contains a very interesting communication with the signature "R. L." The writer has been in the habit of using the following formula:—

A.

Water	1000 c. c.
Sulphite of soda.....	15 grammes.
Eikonogen.....	5 ,,
Hydroquinone	150 ,,

B.

Water	1000 c. c.
Carbonate of potash	50 grammes.

For development two dishes are used, one containing 100 c. c. of A, and 5 c. c. of B, and the other 100 c. c. of B and 5 c. c. of A. For want of time, the writer prepared the solutions with cold water and placed the ingredients of A together in the water. The stock was stored in a clear glass bottle and corked. Eighteen hours after, the solution was found yellowish and degraded and it had lost its power of development. To ascertain the cause the writer arranged a set of experiments. The solutions were prepared firstly, with cold water as before; secondly, with boiled water which had stood to cool, and, thirdly, with boiling water. The solutions were stored for ten days, half of each being placed in yellowish brown, and half in colourless bottles. The bottles of solution were corked and exposed to light. Both samples prepared with cold water had lost their power of development. Both prepared with cold, boiled water would only develop the high lights, but both prepared with hot, boiling water were in excellent condition, developed well, and there was no apparent difference between the samples stored in the two kinds of glass bottles. The writer ascribes the loss of power solely to the presence of air in the water, which caused oxidation. Water absorbs air, which is expelled by boiling, but it is again taken up as the water cools. Gases also are only slightly soluble in saline solutions.

The Persulphate Reducer. An article in "Das Atelier de Photographen" refers to the unce which is sometimes observable in the use of persulp ammonium as a reducer. The salt, like other persul decomposes readily as an acid solution. Oxygen is gi and a sulphate remains. If the solution is alkalir oxygen is retained, but as the process of reduction d upon the conversion of the metallic silver of the im oxidation to oxide of silver, such a solution is of as a reducer. Two rules may be deduced from these Firstly, the ammonium persulphate should not be di until required for use. Secondly, the solution sho tested for acidity with litmus paper, and if the reac not distinctly acid, a little sulphuric acid should be Another precaution should also be taken. The plate reduction, should not be rinsed immediately under t as the oxide of silver is in a very fine state of divisi easily converted to metallic silver. The latter will ta form of a bluish precipitate by reflected, but brown transmitted light. The plate should be immersed in tion of sulphite, or hyposulphite of soda. Sulphite ferable, but if hyposulphite is used, the solution shou be poured upon the plate. Rapid immersion in a d preferable, as the action may otherwise be unequal. certainty in use, three points must be remembered. a fresh solution, see that it is acid, and stop the act the persulphate by immersion in a suitable bath.

* * *

Chloride Papers for Development. L. Hermann Liesegang contribut interesting paper to the "I tographische Chronik" upon the subject of chloride for development. It has special reference to the " paper, as sold by the well-known firm, E. Liesega Dusseldorf, but the remarks concerning the influe exposure and strength of the developer are of general est. The developer used for "Pan" paper is prepar follows:—

Boiled water	1 litre.
Sodium sulphite	20 grammes.
Hydroquinone	3 ,,
Carbonate of soda	50 ,,
Bromide of potassium	2 ,,

Assuming the negative gives an olive green tone wi seconds exposure, the following factors of exposur ratios of dilution for the developer may be used.

Tone.	Exposure.	Concentration of developer.
Greenish black	1	1 to 5
Olive green	2	1 ,, 5
Sepia	3	1 ,, 10
Brown	4	1 ,, 10
Red brown	6	1 ,, 20
Yellowish brown	8	1 ,, 20
Red	5	1 ,, 30
Reddish	10	1 ,, 30
Yellow	20	1 ,, 40

Probably the same interdependence of tone, exposure development, may be found with other chloride pape development now upon the market. The best mea obtain good blue-black is by toning a sepia print with

se etate.

Professor E. Valenta has made some experiments with this substance, as a substi- r pyroxyline, in the preparation of collodio-chloro- emulsions, and makes the following observations ie subject in the "Photographische Correspondenz." se tetracetate was prepared in 1894 by Cross and from cellulose hydrate with a solution of zinc or ium acetate, and a patent was obtained for the pro- Cellulose tetracetate is easily dissolved in chloro- . A five to ten per cent solution is rather dark in colour ars but slowly. It is also soluble in epichlorhydrin, nzol, and glacial acetic acid. From the latter it precipitated by water, or alcohol, in the form of rent, gelatinous flakes. Although the substance is le in acetone, its solution in chloroform may be di- ith acetone, and some further addition of alcohol made without causing precipitation. Such a solu- y be used for the preparation of emulsions, and if precautions are observed, they are easy to coat and rviceable printing papers. The experiments indi- hat printing paper of very good quality might be y using cellulose tetracetate, the characteristics being s and toughness of film, and a degree of sensitive- tween that of albumen and collodio-chloride. The easily permeated by the usual toning and fixing . Toning, consequently, proceeds rapidly. The film well to its support, and the gradation of the print es that of albumen. The film is likewise very ro- d may be easily spotted by the retoucher. As r Valenta has not concluded his experiments he from giving a formula at present.

THE CONVENTION.

II.

nvention at two or three of its meetings has worn national aspect, as some of the older members will . Photographers from the United States, from and from Germany have occasionally put in an nce, and have received a cordial welcome from their confrères. There has even been talk of the Con- one day going to Antwerp, Brussels, or Paris for its -place. The idea, however, has not hitherto ap- practicable, although it is tolerably sure to be re- the not distant future. We should not be sur- the Oxford Convention formed the starting point discussion. For the Convention this year, unlike its predecessors, which, as we have hinted, have en perfunctorily international in character, will recognise the presence of the members of a Con- Photographic Association. The Union Inter- e de Photographie, of which M. Chas. Puttemans, Van Bemmel, Bruxelles, is Secretary, have decided their Annual Meeting at Oxford in conjunction Convention. For the convenience of our Continen- ors the outline programme of the week's arrange- as been printed in French, and we also understand principal parts of the Handbook have been trans- o French and distributed amongst them. Indepen- the Union Internationale, we are advised that M. Juhl, President of the Hamburg Photographic will be present at Oxford, and may be accompanied by some of the members. Thus it is probable that this year's Convention will attract visitors from Paris, Brussels, Antwerp, Hamburg, Jena, and other places abroad.

The Union Internationale de Photographie resembles to some extent our own Convention. It meets, if we mistake not, at a different centre each year—Brussels, Paris, Antwerp, Geneva, Zurich are some of the cities that have been visited, and membership—we write from memory—is not restricted to one nationality. The time-honoured excursions, which are such favourite features of our Convention meetings, and to which we shall make special reference in a future article, furnish one object of the Union Internationale's meetings, at which there are also addresses, papers, and discussions on subjects of photographic interest. In constitution and in aims the Union seeks, we believe, to exercise in matters of photographic economics some degree of authoritative influence, and it includes in its ranks many able men whose reputations are something more than local. The members of the Union Internationale de Photographie who honour the Oxford Convention by their presence are assured of a cordial welcome. The subject has come before the Council on more than one occasion, and a unanimous desire has been expressed to render the visit of our Continental confrères as pleasant and enjoyable as it is possible to make it. We are sure that they will find the English photographers assembled at Oxford anxious to render them every courtesy and hospitality, willing to impart, receive, or exchange information on all phases of camera work; and ready in every way to show their appreciation of the fact that a common bond of interest unites them, viz., devotion to photography.

No less cordial, we are sure, will be the welcome to unattached visitors from Hamburg or elsewhere who may not be members of the Union. It is fortunate that the beautiful University city of Oxford is to be the scene of the first International Convention, for the visitors cannot fail to be favourably impressed by their surroundings during the week of fraternisation. British and Continental photographers have much to learn from each other. By direct experience and observation they know little of each other's ways of working. Their styles and sizes of apparatus differ from our own; their ideas on development, printing, and other branches of work resemble ours in principle, but not always in detail. They may or may not be more "pictorial" in their aspirations than ourselves. Their photographic institutions, and their press, are obviously unlike our own. Here the photograph is a powerful factor in modern illustration: on the Continent the same influence may not be at work to an equal extent. Here the photographer, be he amateur or professional, is gradually extorting that public recognition and esteem which only a few years ago were denied him; how does the case stand on the Continent? In these respects our visitors will have ample scope for observation and opportunity of making comparisons between the general standing of photography in this country and across the Channel.

What it is the fashion to call *l'entente cordiale* should be promoted, in however small a measure, by the Oxford Convention: for when a number of members of different nationalities meet in the practice of the friendly arts the spread of good feeling and mutual esteem is facilitated. We trust our contemporaries in France, Belgium, and Germany will assure their readers that those of them who intend being present at the Convention at Oxford in the week

July 8th-13th will receive a kindly greeting and a warm welcome from their British hosts, who will use their best endeavours to make them appreciate a week's photography amongst the most delightful scenery and the grandest architecture in England. The annexed programme, in brief, printed in French, may be found useful for reference by our Continental readers:—

UNION INTERNATIONALE DE PHOTOGRAPHIE.

SESSION D'OXFORD,

(Angleterre),

8-13 Juillet, 1901.

President d'Honneur—Sir Wm. J. Herschel, Bt.

Programme des Séances, Excursions, &c.
Pour la Semaine.

Avis.—Oxford est à 10 kilomètres environ de Londres. Prix des Billets de chemin de fer. Aller et Retour: 3me classe, 10s. 7d.; 2me classe, 11s. 8d.; 1ère classe, 18s. 6d.

Pour de plus amples Renseignements, au sujet des Hôtels, Appartements, départs des Trains, consulter le "Programme Officiel" qui paraîtra prochainement. S'adresser aux Secrétaires.

PROGRAMME.

LUNDI, 8 JUILLET, 1901.

7.30 du Soir.—Ouverture et Réunion des Membres (Conversazione) à l'Hôtel-de-Ville. Le Maire, ainsi que les principaux habitants de la cité, les Membres du Club Photographique d'Oxford, et les Dignitaires et Membres des diverses Sociétés Littéraires et Scientifiques souhaiteront la bienvenue à tous les Membres présents. Le Président, Sir W. J. Herschel, prononcera son discours d'Ouverture. Après un intervalle, il y aura Projection de Diapositives, oeuvres de Photographes en renom.

MARDI, 9 JUILLET.

9 Matin.—Excursion par Bateau à Vapeur, reservé exclusivement pour les Membres, de Dorchester à Iffley, Nuneham, Abingdon, &c., avec arrêts aux endroits les plus pittoresques, et retour le soir à Oxford. Prix des Billets, inclus "Lunch" et Thé, 6s. 6d. par personne.

MERCREDI, 10 JUILLET.

10 Matin.—Réunion Génêrale (annuelle) à l'Hôtel-de-Ville 11 Matin.—Réunion de Nouveau Conseil. 3 Soir.—Le Président, Sir W. J. Herschel, tiendra une reception dans les Jardins du Collège "Worcester," à laquelle tous les Membres sont cordialement invités. 3.15 un Groupe Photographique sera pris de tous les invités. 7 soir.—Banquet annuel et Concert (Smoking Concert) auxquels les Dames sont invitées. Billets (vin non-compris) 5s. 6d. par personne.

JEUDI, 11 JUILLET.

8.42 Matin.—Excursion par Chemin de Fer "Great Western" à Warwick, Kenilworth, &c. Billets, y compris le droit d'entrée aux Châteaux, 6s. 6d. par personne. La "Warwick Dry Plate and Film Company" a l'amabilité d'inviter tous les Membres à un Dejeuner, à la "Court House," Warwick, à 1.30. 8.30 Soir.—A l'Hôtel-de-Ville, Oxford. Un discours sera prononcé, suivi d'une discussion, ainsi que d'une Projection de Diapositives divers.

VENDREDI, 12 JUILLET.

8.42 Matin.—Excursion par Chemin de Fer "Great Western" à Banbury. Après avoir vu la Ville, les Membres iront en Voiture à l'Ancien Château de Compton Wynyates, où on prendra le "Lunch." Billets, y compris Chemin de Fer, Voiture, et "Lunch," 7s. 6d. par personne. 8.30 —A l'Hôtel-de-Ville, Oxford. Discours et Discussion sur l'Exposition de Microscopie et Polariscopie par la Projection.

SAMEDI, 13 JUILLET.

Excursions diverses dans Oxford et les Environs. Le Comité a obtenu la permission pour les Membres de photographier les Collèges et Monuments divers d'Oxford, &c. pendant la semaine de Réunion. Il y aura aussi une Exposition d'appareils photographiques et autres, qui aura lieu à l'Hôtel-de-Ville, et dont l'entré sera libre.

Union Internationale de Photographie. — Secrétaire: Chas. Puttemans, 9, Rue Van Bemmel, Bruxelles.

Photographic Convention of the United Kingdom.—Secrétaire d'Honneur: F. A. Bridge, East Lodge, Dalton-lane, London, N.E.

PORTABLE ENLARGING APPARATUS IN PRACTICE.

THE photographer who has a practical knowledge of enlarging processes, that is the making of enlarged negatives or paper positives, is well aware that no existing "portable" arrangement designed for a similar purpose quite comes up to the sliding easel and frame which probably figures in his own dark room as a permanent portion of its equipment. However this may be, the less fortunate worker has perforce to put up with less stable apparatus, and we may remark, that for the particular work referred to, the apparatus makers have not done at all badly by their amateur clients. We have lately had an opportunity of testing several of these portable enlargers, which experience may not be unwelcome to our younger and less expert readers.

Undoubtedly, the best of these enlargers are those with bellows arrangement:—there is a fixed, i.e., non-folding baseboard (a folding baseboard is no great recommendation), plain and substantial, upon which slides the body; three frames are connected by bellows, measuring or extending in the 12 by 10 size nearly five feet; the first frame is fitted with carriers to hold negatives of the common sizes in use; the second frame carries the lens, which is a separate purchase by the way, and is also conveniently provided with a flap shutter actuated from outside the purpose of making exposures; the third frame is grooved and fitted with a focussing screen and a dark slide. In practice, this enlarger is set up with one end projecting from, or resting upon a window-sill, facing a north aspect, either at some considerable height from the ground, or tilted in order to avoid, in the field of view, reflections and shadows from adjacent buildings. The lens having been screwed into its place, and uncovered, the frame carrying it is pushed to within twelve inches of the end nearest the window, i.e., the end which carries the negative to be enlarged. Theoretically we imagine the baseboard to be of any length, the lens is a

ure; the distance at which, forward, we place the nega-, and that at which, backwards, we place the focussing en, being decided by the focus of the lens used and degree of enlargement required, all of which can, and uld be, to save time, ascertained beforehand by refer- to the enlarging table to be found in the ALMANAC lished by this JOURNAL. Beginners will perceive that this is merely a placing of apparatus as in copying a tograph, or object of any kind, as there is no essential erence between the operations; we have merely put up egative to be copied, and are using transmitted light ead of reflected. The negative to be operated upon g placed in its carrier, the lens frame is then clamped bout eight or nine inches behind it, and the focussing en drawn back to considerable distance behind lens; using a lens of 8 in. focus, and for an enlargement n half-plate to 12 by 10 the distances will be approxi- ely twelve inches between negative and lens, and twenty- inches between lens and focussing screen; if now we the picture not of the size required, we must, to make it er, shorten the distance between lens and negative and her extend the bellows and screen, or to make it smaller ease the distance between negative and lens, and re- e the space between lens and screen; in any case, having the outlines of an image on the screen the operator st adjust it by movements, as described, to his require- nts. This is all plain sailing, the apparatus is steady, or easily be weighted, accurate focussing is possible, and the erent frames may be clamped tightly to prevent any idental movement in the line of axis or otherwise. The y possible complaint to be brought against this apparatus hat applicable to all portable contrivances, the trouble putting up and taking down; naturally much initial uble is avoided if, having once obtained the correct size l focus for a certain magnification, we carefully mark baseboard, so that at any time the frames may be ex- ded and clamped to the same positions.

There is in all enlarging operations more or less difficulty getting even illumination all over the negative; one may, course, dodge the clouds to some extent, but it is easier, the risk of a little extra exposure certainly, to set up a ce of thin and finely ground glass in front of the negative evenly distribute the light falling upon the same.

A second piece of enlarging apparatus was satisfactory, o, in the sense that work of a kind was possible with it; he worker is satisfied with a purely mechanical operation, fixed focus enlarger may be used with effect; the oper- on is one in which all the focussing is already done for ; fixed focus enlargers are quite satisfactory only when parts which need handling are made of wood or metal, ily fixed and removed, and, of course, light-tight; they ve to be carried bodily from dark room to daylight, set with the negative end facing the sky, and an exposure de by removing a large cover—a difficult thing to do th an even motion, and a fatal business if, as is often the se, the cover sticks. Cardboard may be used in a fixed us camera as a substitute for wood, in those parts usually cupied by bellows, but nowhere else. A camera made tirely of this material is not to be recommended.

For the purpose of making enlargements from a series of all negatives, say from quarter plates to the whole plate e, the fixed focus enlarger is all right; there is, of course, latitude possible, it must be the whole negative or none, ough equally of course, a portion of a larger negative or film may be put in place of the smaller one. Rather effective enlargements may be got in the apparatus by putting a mask on the negative, producing on the enlarged copy something of the effect of a vignette. At first sight "clouds" would appear to be almost impossible of achievement, and certainly a considerable amount of care and skill would be required to get good results by any process of double printing; it is easier and quite effective to do one's best with the sky which may be already indicated on the negative; many snap-shot negatives show very fair sky effects, and, as a matter of fact, if the exposure is carefully made and timed, exposing the foreground in advance of the sky, and in development following up the idea so far as is possible, to control the action of the solutions so that the sky may be brought out proportionately with the landscape, the results may be made quite pleasing.

RULES OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Founded March 28, 1901.

EXECUTIVE COMMITTEE (pro tem.):

Chairman: Thomas Bedding, F.R.P.S.

Vice-Chairman: Alexander Mackie, F.R.P.S.

Harold Baker.
H. Walter Barnett.
Robert Beckett.
F. A. Bridge.
G. R. Cleare.
H. J. Dalby.
J. Done.
R. H. U. Ellis.
E. Stanmore Gibbs.
W. Green.
Henry Hallier.
F. Hollyer.
H. E. Hull.
E. D. Lavender.
E. Milner.
H. W. Newton.
W. G. Parker.
Lang Sims.
W. Edward Wright.

Hon. Treasurer: William Grove, 63a, Baker-street, London, W.

Hon. Secretary: Alfred Ellis, 51, Baker-street, London, W.

Assistant Secretary: E. W. Simmons.

1. The Association shall be called "The Professional Photographers' Association."

2. The objects of the Association shall be:—(*a*) To promote the interests of its members in their professional work. (*b*) To watch Parliamentary or Public action affecting the interests of Photographers. (*c*) To deal with matters affecting professional custom and practice. (*d*) To co-operate with similar associations for the purpose of securing united action and mutual support in dealing with matters affecting the profession.

3. Membership shall be restricted to persons engaged in the commercial production of photographs, who shall be either in business on their own account, or in partnership, or responsible managers of firms or companies.

4. Professional photographers may be admitted to membership on the nomination of a member, or on their own application; the Committee shall decide any question as to eligibility.

5. The annual subscription shall be 5*s.* payable on admission, subsequent subscriptions shall be payable in advance on July 1 in each year. No member shall be entitled to any of the privileges of membership if his subscription shall be three months in arrear, and the Committee shall have power to terminate the membership of any one whose subscription is more than six months in arrear.

6. The ordinary meetings of the Association shall be devoted to the discussion of matters concerning the welfare of professional photographers, and the profession only; they shall be held on the first Fridays in February, April, June, October, and December. The Committee may call extraordinary meetings when they may think it advisable.

7. All general meetings shall be held in the first week in July, for the purpose of receiving the report of the Committee, and the balance-sheet for the past year, the election of Officers, and such other business as may require the decision of a general meeting. Notice of the meeting, together with a ballot paper shall be sent to every member not less than fourteen days before the date of the meeting. A special general meeting may be called by the Committee at any time. A special general meeting shall be called within fourteen days of the receipt by the Hon. Secretary of a requisition signed by ten members stating the purpose of the meeting. Every member shall receive seven days' notice of a special general meeting, and no subject shall be discussed thereat but that for which the meeting was called.

8. Alterations of the rules shall only be made at the general meetings or a special general meeting. The alterations proposed shall be stated in the notice convening the meeting.

9. At all meetings the vote shall be taken by show of hands unless a ballot be demanded.

10. The Honorary Officers of the Association constituting the Committee shall be a President, Vice-President, Treasurer, Secretary, and twenty ordinary members of the Committee, not more than ten of whom shall be London members. They shall have power to appoint an Assistant Secretary, who may be paid. At meetings of the Committee, five shall form a quorum.

11. The Committee may make such by-laws and regulations, not inconsistent with the rules, as they may from time to time think necessary. They shall also have power to appoint sub-committees for special objects from the members of the Association.

12. The Officers shall retire annually, but shall be eligible for re-election. At a special meeting of the Committee, to be held in the month of May, the Committee shall select by ballot a President, a Vice-President, and twenty-two other members for the new Committee as their nomination. Any member, by letter addressed to the Hon. Secretary not later than May 31, may nominate a President, Vice-President, and not more than twenty-two other members. The Hon. Secretary shall write to each member nominated to any office, asking whether he is willing to serve if elected, and no reply within four days shall be taken to signify acquiescence. A ballot paper shall be prepared containing the names of all the members nominated, and eligible and willing to serve, in alphabetical order, but no other information except that relating to the taking of the ballot. The ballot papers shall be collected at the Annual General Meeting at nine o'clock.

13. At their first meeting the new Committee shall elect a Treasurer from amongst those elected on the Committee. They may appoint any member as Hon. Secretary, notwithstanding such appointment may increase the number of ordinary members of Committee by one. Should any Officer resign, or become incapable of acting, the Committee may fill the vacancy.

14. If ten members shall sign a report to the effect that they consider it desirable that the membership of any member shall be terminated, on account of conduct either tending to bring discredit on the profession or obnoxious to his fellow-members, the Committee on receipt thereof shall call a special general meeting to discuss the matter ; then if a majority of two-thirds of those present so decide, the offending member shall be expelled.

15. Proper books of account shall be kept by the Treasurer, and a book of minutes of all meetings shall be kept by the Hon. Secretary.

16. The payment of a subscription by a member shall be taken as indicating acquiescence in these rules.

"TO SAFEGUARD THE INTERESTS OF PHOTOGRAPHERS."

[Reprinted from "Wilson's Photographic Magazine," the leading professional journal of the United States.]

Such is the brief but comprehensive way in which the "Professional Photographers' Association of Great Britain" defines its reason for existence.

The photographers of the British Isles have long groaned under a score-and-one more or less exasperating conditions. Though they have groaned in unison they have protested as individuals, and h long felt the weakness that comes from lack of union. At last final straw has been added, and, to mix the metaphor, the wo has turned.

As we have already briefly noted, certain English natio advertisers are offering cabinet photographs as premiums. Sun coupons, together with sixty cents and a photograph, are to be s to them, and they in return send a dozen mounted cabinet print bromide prints. Naturally this is a serious hit at photograph especially at those smaller men in the country towns, and it called forth much vigorous protest. This protest gradually t practical form in the shape of a meeting of London photograph called to discuss some united mode of action. The chair was tal by our confrère of The British Journal of Photography, Thomas Bedding, but apart from him the hundred who put an appearance were all directly interested in the production professional portraiture.

In a long and able summing up of conditions, the Chairm pointed out many difficulties which beset the photographer, and so at least of which might be overcome by united action. Pho graphers on this side who take (or don't take) an interest in copyri and similar matters can sympathise with our British brethr Among the things suggested as coming within the scope of a unit body, the watching of legislation, local and imperial, was emphasis The Factory Act (which regulates the hours of assistants), t question of fair and reasonable insurance, a strong benevolent as ciation, and the ownership right to the negative were all mention Apprentices and employés were referred to, and then came the ratl delicate questions of price-cutting and of commercial honesty, su as calling a bromide a platinum. Finally, when it was pointed o that the photographer had to pay full, discountless, retail prices everything, even when he wished to become a dealer, and that oth oppressions were "too numerous to mention," it was felt that strong case in favour of union had been made out.

It was stated that the photographers of London numbered son three hundred, and of the rest of the country about four thousa The meeting, with the exception of some dozen or more persons, w composed of London professionals. These practically resolved thei selves into a local "chapel," selecting twenty-six Londoners to for a temporary committee to undertake the preliminary arrangements rules, officers, &c. It is suggested to form a central union in Lond and provincial ones in as many cities or districts as proves feasib The provincial associations will be represented on the London com mittee by two of their members. It is hoped that by this means t whole country will be covered by a strong body ready to unite at a time or in any district for vigorous action.

In its first inception the Professional Photographers' Associat seems to have a strong measure of support. Of the need of such association there can be no two opinions, and we sincerely hope th our British brethren will not rest until a really strong union is accomplished fact.

THE LIPPMANN PROCESS.

Dr. R. Neuhauss continues in the "Photographische Rundschau his notes on the above process, and states that during last summ several complaints reached him as to the difficulty of obtainin the greens, particularly in landscape work. He says that glycinro when added to the emulsion, gives good green sensitiveness, but th this should be supplemented by an addition of erythrosine. He us from 0·1 to 0·5 per cent. of a 1 : 500 solution of erythrosine, bu various makes of this dye differ in their properties, and therefore eac must be tested, as too much causes a preponderance of the greenish yellow and yellow. This fault may also be caused by defectiv development, and he found that when Lumière's pyro-ammoni developer is used in hot weather in its full strength, development i too rapid. Experiments proved to the author that when Lumière developer was diluted with ten times the quantity of water, bette results were obtained.

With diluted developers, particularly amidol as used by Lippman

iself, the colours obtained have no brilliancy, and it is necessary to ensify with mercury, followed by amidol developer. It is rather portant as to when this intensification is done, for if the developed te is placed in an ordinary fixing bath, the image will be seen to at e bleach, and by prolonged immersion the finely divided silver l be entirely dissolved. Lippmann therefore prefers to intensify ore fixation, and the results are very striking, as the colours are re brilliant, and the image does not lose in the subsequent opera- n of fixing, as the deposit is rendered more capable of with- nding the action of the hypo.

Neuhauss has kept Lippmann plates for seven months without ticing any change either as regards increase or decrease of speed, l at the end of this time they worked perfectly.

With regard to the "schlieren," or dirty smears, which are caused the surface of the Lippmann plates by contact with impure rcury, and which cannot always be avoided even by the use of the rest mercury, they can be removed, as pointed out by Miethe, by bbing with washleather damped with alcohol, but there is great nger of the colours being changed. There is less danger of this if nzole is used, but the best method is one communicated verbally to e author by Professor Lippmann, which is to shake into a flat dish me crystals of metallic iodine and place the plate on top of the sh, film downwards, from one-half to one minute, when the vapour the iodine combines with the metallic silver of the "schlieren," and e iodide thus formed can be dissolved with hypo, and this is fected without the image being affected.

It is frequently found that when the specimens have been covered r some time with the prisms, air bubbles make their appearance the Canada balsam: this is due to the unevenness of the glass, d it can be avoided by using plate glass for the support of the nulsion. In order to be able to warm the picture before cementing, is necessary to warm the plate before putting in the mercury slide, else incorrect colours are given. If small bubbles are enclosed in e balsam when cementing on the prisms, they should not be pressed t, but left for a few days, when they will disappear by diffusion.

In order to avoid the reflections from the back of the glass, it is ecessary to blacken the same, and it is usual to use asphalt varnish, t this is incorrect, as its refractive index is very different to that of e glass, and this gives rise, especially with thin images, to reflections. lack oil colour or Canada balsam rubbed up with lamp-black may e used; or better results still are obtained by using black water olour, such as the bone-black of Schönfeld & Co., of Düsseldorf; but nfortunately these in time show small cracks. Much better results re obtained by cementing black glass on to the back with Canada alsam, and, in order to avoid inequalities of surface, Braun of König- rätzer Strasse 31, Berlin S.W., has, at the author's suggestion, laced such glass on the market with one side with a mirror polish.

THE SPECTACLE-MAKERS' COMPANY'S EXAMINATIONS.

THE May examination for diplomas for opticians, held under the auspices of the Spectacle-makers' Company, was opened at the St. Bride Institute on Wednesday evening, May 15, and the candidates who sat for the diploma were addressed by the Worshipful Master of the Spectacle-makers' Company, the Right Hon. Sir William Hart Dyke, Bart, M.P., as follows:—Gentlemen, it is with extreme pleasure that I come here to-night, because, as you are aware, as Master of the Spectacle-makers' Company, I represent—at all events in my person so long as I am Master—the efforts of that Company to assist this great trade with which you are identified, and to endeavour to secure, not only on behalf of the trade but on behalf of the British public also, that its interests should develop, and that, for the benefit of all, we should endeavour to organize the education of the trade up to a certain standard. Well, gentlemen, you are going to be put through the test of an examination. I confess, speaking for myself, that an examination always produced a wholesome terror in my mind; but at the same time we are a competitive race, and I wish to urge upon all of you her to do your very utmost to succeed in the task which lies before you to-day. I am a great believer myself in the test which is about to be applied to you. I think, from all I can gather, and from some experience in these matters that the test which is applied in these examinations is a fair and just one, and I believe that the result, so far as the objects we have in view are concerned, is likely to be adequate—that is to say, you will have a fair test applied to you as regards efficiency and skill in the trade which lies before you. These examinations, which were initiated, as you know, by the Spectacle-makers' Company, have had a fair trial. Six examinations have been held in three years, and the average number of candidates who have appeared has been 59, of which I think an average of something like 46 have passed. I hope some of those I see before me may win the distinctive merit, that is to say a certain percentage of marks which will earn the merit of distinction. It has been done before, and I hope some of you will be successful in obtaining it. This trade is not only a very important one, but a very large one, and, of course, the efforts of the Spectacle-makers' Company have not covered a very wide area, but I think we ought not to be discouraged at that. We have already issued about 324 diplomas, and from what I hear as to the applications of candidates to enter these examinations, it will not be very long before the number is nearly doubled. I should like to say, at starting, that the pressure of candidates is such that, owing to that and other causes, we propose to hold another examination in November next. (Cheers.) Now, one word before I sit down in regard to the subject with which I have been very much identified, and that is really the question which has brought you—some of you late in life—before me this evening. I allude to the whole question of the technical and practical education of this people of ours. Well, we have been very backward in this country as regards this matter. Other countries appreciated the importance of it years ago, and knew the value of the application of science and art to special industries, and indeed to all industries—Germany, Switzerland, and France, and in America also, very great strides were made; and while we were only talking in Parliament and out of Parliament as to what we were about to do, other countries had grasped this idea, considered it, and brought it to a practical result. Therefore, as I say, foreign nations have gone far ahead of us as regards the education which is afforded the people. The words "Made in Germany" are almost household words. We are met with them on every side. And they are not only household words, but they convey, surely, a very accurate and a very clear warning in all our great centres of industry, where they are thoroughly understood and appreciated. And there is one thing which has struck me very much indeed, and it is this: that if there be a trade or industry in this country of ours, in the prosecution of which the application of science is necessary in all its stages, it is that of the optician, and yet I should almost be afraid to move in Parliament for a return, if it were possible to gather it during the last ten years, of how many young men have plunged into this trade without ever having attended an evening continuation school or an institute, or gone through any educational process whereby they might get even a glimmer of the very earliest principles of the sciences which underlie this great trade. Well, that surely is a blot upon our educational system on which it is not pleasant to dwell. For myself, although I think that the efforts which this Company is making are most valuable to the trade and to the British public also, although I think that these diplomas which we issue are of great value not only to yourselves, those of you who succeed in getting them, but to the public at large, affording a security to the purchaser which he would not otherwise possess—yet, personally, I cannot say that I am content with the precise educational advantages which this scheme of ours offers. It may be difficult, it may be impossible to extend and develop it; but personally speaking only for myself, I should like to see this scheme developed a little more, as a direct educational machine. I should like to see it extended more, so as to encourage real educational work. It may be impossible for us to do this; but I would remind you of this, that the educational development in the metropolis has not reached its limit, and is daily increasing. The London County Council and other agencies are at work, and there is an extraordinary increase of educational activity now in this metropolis, and, that being so, I think that we as a Company should do our very utmost to encourage this result—that no young fellow should attempt to enter this trade of an optician without first going through a thorough course of training. If we can secure that result as regards even half of those who enter this trade we shall produce very valuable results. And now, gentlemen, I am not going to detain you longer, except to say this, that as one who has been an earnest worker in this cause of education, and has passed Bills through Parliament bringing about a great change in the instruction of our people, I have come amongst you to-night after a very hard day's work to encourage you in the task, not only to show that I wish, as Master of this Company, to identify myself personally with your efforts here to-night, but to wish you all success, not only in this present struggle in this ex-

amination, but also in all your undertakings in life and a happy and prosperous future.

Mr. Thornthwaite (Past-Master), in moving a vote of thanks to the Master for his attendance to open the examination, said: I should like to convey to the Master your best thanks for his very kind speech, and for coming to grace this occasion by his presence. I feel very much indebted to him for the support he has given to me, as one of the originators of the scheme. He has been a right-hand friend throughout, and I am sure he will be a friend to every one throughout this great metropolis who may come up for these examinations. I wish to propose a cordial vote of thanks to our Master for coming here to-day.

This was carried by acclamation.

Sir William Hart Dyke, responding, said: Well, gentlemen, I thank you very much for your kind vote of thanks, and also my friend, Mr. Thornthwaite. It has given me great pleasure to be here to-night; it has been, in fact, a labour of love to identify myself with your work this evening.

PHOTOGRAPHY AT THE ALEXANDRA PALACE.

The dedication of the Alexandra Palace to the education and recreation of the people is in itself a notable event, but it is of particular interest to photographers, inasmuch as one of the features of attraction provided by the management is an exhibition of photographs.

Photographers will not need to be reminded that the applications of photography are so varied, there being scarcely an art, science, or industry in which its assistance is not in some way or other called into requisition, that as an educational means it is impossible to overestimate its importance. In commerce it is freely utilised. Manufacturers use it to illustrate catalogues of their wares. Railway companies use it to make known the scenery of the places served by their lines. The medical man, the architect, the surveyor, the painter, the horticulturist, the botanist, the geographer, the astronomer, the microscopist, the antiquarian, the engineer, all find in it an invaluable servant. The illustrated newspapers are dependent on it. Nowhere do we find its value unrecognised, except precisely where one would expect the fullest advantage would be taken of its inimitable power of recording facts—in our museums and educational exhibitions. Under these circumstances the Trustees of the Alexandra Palace deserve the thanks, not only of those interested in the progress of photography and the extension of its sphere of usefulness, but of the community in general, in having established a precedent in making photography a feature in the educational scheme.

Our sense of gratitude, however, must not prevent us from pointing out that the accommodation provided for the photographs is far from suitable or adequate. The corridors in which they are exhibited are most unfortunately lighted for their display, and are so divided up that any systematic arrangement is nearly impossible. It is a pity that one of the picture galleries could not have been reserved for photography, particularly as a not inconsiderable proportion of the paintings there exhibited might have been omitted with great advantage to the exhibition as a whole.

Considering the difficulties they had to contend with, the Committee who had the arrangements of the photographic section in hand have performed their task in an admirable manner. The entire wall space at their command was something under 150 feet linear, and they have contrived to include, in addition to a capital selection of modern pictorial photographs, a number of interesting examples of some of the earlier photographic processes, and a useful series illustrative of some of the applications of photography to the sciences. Of the pictorial work we need say little. The names of those contributing will sufficiently indicate that it is representative, and that it will do credit to photography. The contributors are Messrs. J. Craig Annan, F. A. Bolton, R. W. Craigie, Miss M. Donaldson, Messrs. Karl Greger, W. A. J. Hensler, H. Vivian Hyde, C. F. Inston, Charles Job, Alexander Keighley, Mrs. Aubrey Le Blond, J. C. S. Mummery, C. H. Oakden, W. Rawlings, C. Reid (of Wishaw), and J. B. B. Wellington. The Royal Photographic Society lends early Talbotypes; the experimental photographs in moist collodion by Spiller and Crookes; early instantaneous photographs by Blanchard and England; early carbon prints by Swan; Woodbury's experimental work in Woodburytype; the "Birth of a Cloud," by Birt Acres; tele-photographs, photographs taken from a balloon by W. Jennings, and photographs of tin-mining by J. C. Burrow. Mr. W. Pouncy contributes specimens of the experimental work of J. Pouncy, of Dorchester, in gum-bichromate and other carbon processes; the Autotype Company, a frame of modern carbon prints; Colonel Stewart shows panoramic photographs; Mr. J. S. Teape photographic enamels; Mr. T. E. Freshwater, F.R.M.S., contributes micro-photographs and photographs illustrating bee culture. Messrs. R. B. Lodge and Oliver Pike each send a number of natural history photographs. Photographs of lightning are exhibited by Messrs. J. H. Glew, and Sanger Shepherd. Mr. F. W. Webb, of the London and North-Western Railway Works, Crewe, contributes photographs of locomotives, and Messrs. Newton and Co., of Fleet-street, exhibit Professor Vernon Boys' photographs of flying bullets.

This list will sufficiently show that a fairly wide field has been covered. It is regrettable that opportunity was not given for carrying out a more complete scheme. The present exhibition will remain during the summer season, and we understand it is contemplated to hold another next year, when, we trust, the management will see their way to provide better and more ample accommodation. We feel sure that the present exhibition will prove that photographic work is of immense interest even to those who understand nothing of its mysteries, and yet it barely touches the fringe of the subject. Photography in colours, photography as applied to warfare, X ray photography, photo-mechanical processes, three-colour work, astronomical photography, photo-surveying, to mention only a few photographic applications, are entirely unrepresented. We may rely upon the public spirit of photographers and others to provide the material where the object is so praiseworthy.

NOTES ON THE REVERSAL OF THE PHOTOGRAPHIC IMAGE

[A Paper read before the Camera Club, and reprinted from its Journal.]

I.

The observation of the reversal or apparent destruction of the impressed photographic image was a very early one in the history of photography. Early in 1801, Ritter showed that silver chloride, which had already been darkened in the violet rays of the spectrum, became lighter again when exposed to the yellow, red, and especially the infra-red rays, and he attributed this to an oxidising action of the less refrangible rays counteracting the deoxidising action of the more refrangible rays. ("Phys. Chem. Abhandlungen," ii. 90.) Wollaston on the other hand, shortly afterwards, in 1804 ("Nicholson's Journal," viii. 293), stated that about the same time as Ritter, he had found that while gum guaiacum became green by oxidation when exposed to the violet rays, it was deoxidised and brought back to its original yellow colour by the red and orange rays. The same decolourising effect could, however, also be produced by heat. Much later, in 1840, Sir John Herschel described a similar experiment in which, again, paper coated with the alcoholic tincture of guaiacum was first exposed to light, and then exposed in the spectrum, the result being that the part acted on by the more refrangible rays became of a darker blue than the original ground, while about the orange ray the original pale yellow colour of the paper was restored ("Phil. Trans. R. S.," 1840, 35). I have with me a plate which shows this effect very clearly. A piece of polished silvered glass was coated with a fairly strong alcoholic solution of guaiacum, and then exposed to light for some time, until the varnish became of a fine green colour. It was then exposed in a printing frame for three days under an artificial spectrum of colour glasses. As you will see, under the blue glass, No. 13, the colour has become much darker and bluer, while under the orange and yellow glasses, Nos. 4, 5, 6, 7, especially the latter, the green colour is quite bleached out, and under the green and red glasses, Nos. 2, 3, 8, 9, 10 it is also lighter than it was at first in the parts protected from light. Paper coated with the tincture shows the same effect, but not so strongly.

I can also show you Ritter's experiment on pieces of P.O.P., first darkened and then exposed under the same artificial spectrum. You will observe that when the paper is only slightly darkened it darkens still more under all the glasses, but when it is fully darkened at first the spaces under the red and orange glasses, Nos. 3, 4, 5, 6, are distinctly lighter, and the opaque numerals, which appear light in all the other spaces, are in these darker than the ground.

In 1842, J. W. Draper, by allowing daylight to fall along with the spectrum upon a Daguerreotype plate, found that the daylight and sunlight antagonised each other, and thus he succeeded in obtaining the first photograph of the red end of the spectrum showing the α, β, and γ lines below A, these lines appearing positive.

This bleaching action of the red and orange rays upon sensitive surfaces already darkened or affected by exposure is very remarkable when taken in connexion with the opposite effect which can be produced on under-exposed Daguerreotype, or on paper prints prepared with

id salts of silver containing an excess of nitrate, by continuing the osure under a yellow or red glass. This continuing action of the refrangible rays was discovered in 1840 by Edmond Becquerel, and him to call the more refrangible rays "rayons excitateurs," and less refrangible "rayons continuateurs." It can be shown quite with P.O.P., or on an iodised silver plate.

is noteworthy that Ritter, in discussing the nature of the difference ween the action of the two ends of the spectrum, says that water he chemical agent in all processes of oxidation in the wet way, and it is decomposed in all processes of oxidation or deoxidation. the first case, the oxygen combines with the oxidisable body, and hydrogen is set free or combines with more oxygen to form water w. In the second case, the hydrogen of the water combines with oxygen of the body to form water, while the oxygen formerly bined with the hydrogen goes to the oxidisable body present, the xidation of which it usually only indirectly brings about. In some r researches, he showed that perfectly dry silver chloride is not ed on by white light, or the violet rays.

ome years, however, before Ritter announced this theory in con-ion with photographic action, our own countrywoman, "the in-ious and lively" Mrs. Fulhame, as Count Rumford calls her, had covered, and published in 1794, that the presence of water is ential to the reduction of metals (more especially the salts of gold l silver) by light, an observation which has been confirmed so far most of our ordinary photographic processes are concerned. She d that when light reduces the metals, it attracts the oxygen of the ter, while the hydrogen of the latter unites in its nascent state to oxygen of the metal and reduces it, forming, at the same time, a ntity of water equal to that decomposed. Further, she says, water decomposed in every instance of oxygenation. ("Essay on Com-stion.")

Ritter wrote an analysis of Mrs. Fulhame's book (op. cit. i, 91), and is was well acquainted with her theories, some of which he seems to ve adopted. He himself made a good many observations on the ion of light, and intended to have devoted himself to the study of but was led to give most of his energies to the development of lvanism. This study led him to remark in one of his numerous pers that the result of a thorough practical investigation would be at the polarity of chemistry, electricity, magnetism, heat, &c., was e to a single principle common to all. He was also one of the first recognise the electrical nature of sunlight. Eder says, however, at his hasty and unverified electrical hypotheses led him astray.

Experiments made long after Ritter's, by Robert Hunt, also showed at the accelerating power of moisture in promoting the reduction of ver salts was due to the decomposition of the water and the forma-n of nascent hydrogen. Schönbein has also shown that, in all cases oxidation, in presence of water, hydrogen peroxide is formed. It is ll known that this substance is capable of acting both as an oxidiser d a reducer, and as Sonstadt has found traces of it when silver loride is exposed to light in water, it is probable that it has to be ckoned with in most cases of photographic action.

I have dwelt on these early researches of Mrs. Fulhame and Ritter, cause the principles they enunciated as to the action of moisture in the duction of silver and gold from their salts by the action of light seem be closely connected with the phenomena of photographic reversals, hich it is generally agreed are due to oxidation, though they do not lly represent the complex actions that take place in our ordinary otographic processes.

The lightening action of the less refrangible rays of the spectrum on darkened silver chloride was confirmed in 1810 by Seebeck, who so recorded some interesting observations on the differences of tint ken by silver chloride exposed under coloured glasses, corresponding ith the colour of the transparent medium under which it was ex-osed. With this aspect of the question we have, however, nothing do.

The next process of reversal to be noticed is one that appears to have een first published by Dr. Fyfe, in April, 1839 ("Phil. Mag.," xiv, 53), though several similar processes for obtaining positive pictures irect in the camera were brought out all about the same time, in 839 and 1840, by Bayard and Lassaigne in France, and by Herschel, unt, and Talbot in England.

In Fyfe's process paper prepared with silver phosphate (in most of he other processes silver chloride was used) was first darkened by the ction of light, then immersed in a solution of potassium iodide, and hile still moist, exposed to light in contact with the object to be re-roduced, and left until the whole of the paper exposed became yellow. t thus showed a positive image of the object, dark upon a light ground. he prints were fixed by simple washing in water to remove the oluble iodide. He also stated that darkened silver chloride could be sed, but with a weaker solution of iodide.

Robert Hunt, in his "Popular Treatise on the Art of Photography," ublished in 1841, has given a full account of this method, and has iscussed the principles on which the action is based. He says, "If a dark paper is washed with an hydriodate (iodide in solution), and exposed to sunshine, it is first bleached, becoming yellow, then the light again darkens it. If, when quite dry, it is carefully kept from the light, it will be found in a few days to be again restored to its original yellow colour, which may be again darkened by exposure, and the yellow colour be again restored in the dark. The sensitiveness to the influence of light diminishes after each exposure, but I have not been able to arrive at the point at which this entirely ceases. If a dark paper, bleached by an hydriodate (iodide) and light, be again darkened, and then placed in a bottle of water, the yellow is much more quickly restored, and bubbles of gas will escape freely, which will be found to be oxygen. By enclosing pieces of hydriodated (iodised) paper in a tube to darken, we discover, as might have been expected, some hydrogen is set free. If the paper is then well dried, and shut up in a warm dry tube, it remains dark; moisten the tube or the paper, and the yellowness is speedily restored.

"Take a photograph thus formed and place it in a vessel of cold water, in a few days it will fade out, and bubbles of oxygen will gather around the sides. If the water is examined, there will be found no trace of either silver or iodine; thus it is evident that the action has been confined to the paper.

"We see that the iodide of silver has the power of separating hydrogen from its combinations. In the process of darkening, the liberation of hydrogen is certain; but I have not in any instance been able to detect free iodine; of course it must exist, either in the darkened surface or in combination with the unaffected under layer; possibly this may be the iodide of silver with iodine in simple mixture, which, when light acts no longer on the preparation, is liberated, combines with the hydrogen of that portion of moisture which the hygrometric nature of the paper is sure to furnish, and as an hydriodate again attacks the darkened surface, restoring thus the iodide of silver. This is strikingly illustrative of the fading of the photograph.

"The picture is formed of iodide of silver in its light parts, and oxide of silver in its shadows. As the yellow salt darkens under the influence of light, it parts with its iodine, which immediately attacks the dark oxide, and gradually converts it into an iodide. The modus operandi of the restoration which takes place in the dark is not quite so apparent. It is possible that the active agent *light* being quiescent, the play of affinities comes undisturbed into operation—that the dark parts of the picture absorb oxygen from the atmosphere, and restore to the lighter portions the iodine it has before robbed them of." Hunt then describes a series of experiments on silver iodide which more strikingly exhibit this remarkable peculiarity.

He repeats the above in his later work published in 1857, and I have quoted it at length because it seems to give a very probable exposition of the reactions which take place in some reversals and carries on the theory enunciated by Mrs. Fulhame and Ritter of photographic action being to some extent dependent on the decomposition of water present, either in the atmosphere or in the sensitive surface.

On the same principle, Poitevin proposed in 1859 a method of obtaining reversed positives in the camera which seems to have been successful in his hands for making stereoscopic transparencies.

A sensitive plate was prepared by the wet collodion process, with a collodion containing less iodide than usual for negatives. It was then exposed for a few seconds to direct light, the appearance of the plate being unchanged. After washing to remove the excess of silver nitrate, it was treated with a 4 per cent. solution of pure potassium iodide free from iodine, all these operations being performed in the dark room. The plate was then exposed in the camera about three times longer than the ordinary exposure for negatives. It was next washed to remove the iodide solution, and having been treated with a weak bath of silver nitrate at 2.5 per cent., was developed with pyrogallic acid, acidified with lactic acid. It then blackened only in the parts acted on by light, and after the development had been carried to the usual extent, the image was fixed with a weak solution of hyposulphite or cyanide, or a mixture of the two. The image obtained in this manner was a positive by transparence.

Poitevin gives a list of substances which he found might replace the potassium iodide in bringing about this reversing action—among them those most active were: cyanide of potassium, also when saturated with silver iodide; solution of bichromate of potash acidified with sulphuric acid; dilute hydrochloric acid. ("Traité de l'impression photographique sans sels d'argent," p. 117 ff.)

Sir Wm. Abney has given the rationale of this process in his "Treatise on Photography," p. 305, and has shown that potassium or other simple bromide can be substituted for the iodide.

He also shows that if a plate prepared with silver iodide have a preliminary exposure given to it, and then be given a prolonged exposure in the camera, reversal of the image will take place. If, however, such a plate, after washing, be treated with a solution of a de-oxidising agent, such as pyrogallic acid or potassium nitrite, the reversal will not take place, nor will it if the plate be exposed in a cell containing a hydrocarbon such as benzene, or in dry hydrogen. Con-

sequently, the presence of oxygen in some form is necessary to obtain reversal, and it is not easily obtained if a substance readily taking up oxygen is in contact with the silver salt.

In 1862, Dr. Sabatier gave a description of a method of obtaining direct positives in the camera ("Photo. News," vi. p. 366). A glass plate was coated with a bromoiodised collodion, sensitised in a neutral silver bath, and given a normal exposure in the camera. The plate was developed with weak pyrogallic acid solution, acidified with glacial acetic acid. As soon as the details were out, the developer was poured off, and the plate washed. It was then treated with a 4 per cent. solution of silver nitrate, which was again poured off after a sufficient interval, and then the plate was redeveloped with a pyrogallic acid solution, the development of the positive image taking place quickly if the treatment with the silver solution had been prolonged—more slowly with a shorter treatment or a weaker silver solution. The plates were fixed in hypo or cyanide, and could be toned if desired.

The most interesting feature of this process is Dr. Sabatier's theory of the reversal of electrical action by the second silver bath. He says: "When no more pyrogallic acid remains on the plate, the formation of the negative must necessarily be interrupted, and to form a colour different from the first with the exposed iodide not yet employed, it suffices to substitute for the electrical current which prevailed at the first combination, an electric current of the opposite nature.

"Many substances poured in solution upon a negative, the formation of which has been interrupted, possess the power of inverting the electrical current previously developed, and causing the positive combination to succeed the negative. Such are most of the alkalis, lime-water, solution of ammonia, and especially nitrate of silver."

The presence of strong acids in the bath or developing solution was prejudicial, and, therefore, preference was given to pyrogallic acid with acetic acid which does not interfere with the transformation.

The difficulty, of course, is in knowing when to stop the first development; but Dr. Sabatier says that, with the method he described, successful results were obtained. At any rate, the theory of the reversal of current working the transformation from negative to positive is of interest, though rather vague. It was founded on some observations of the Abbé Despratz, which are given in the same volume. Another method of Sabatier's was by admitting light after the development was started; the light acting on the undeveloped parts caused them to blacken at the expense of the already partially developed parts. Many similar methods with wet collodion will be found in the Journals, and are referred to by Eder, in his "Ausführliches Handbuch."*

MAJOR-GENERAL J. WATERHOUSE.

GLASGOW INTERNATIONAL EXHIBITION.

II.

In a previous notice we referred to a few items that were preliminary to the official opening of this vast undertaking. With glorious sunshine and the entire city en fête, the Duke and Duchess of Fife opened the Exhibition in the name of the King on Thursday, the 2nd inst. amidst scenes of enthusiasm that will not be readily forgotten by those who had the good fortune to be eyewitnesses of the event. In the Photographic Section, since the private press view, the exhibits have been carefully gone over, and one or two minor improvements in the hanging have been effected, and the various chapels have had name-plates placed upon them, so that visitors can at once find out from what country the exhibits have been gathered together. This is an excellent idea, and enables visitors at a glance to ascertain the particular school of work they are inspecting. In our previous notice mention was made of a few names from among the large number of foreign exhibitors, and on closely inspecting the various contributions by foreign workers, a marked distinction between the various schools will be readily observed. In the American Section, in addition to a number of fine exhibits by Alfred Steiglitz, there are some exceedingly striking pictures by Gertrude Kasebier, Clarence White, Holland Day, Edward Steichen, and Mary Devins that deserve special notice. The French School is well represented by such workers as Robert Demachy, Capitaine Puyo, Georges Grimpel, Paul Bergon, René Le Bégue, and others, many of which examples are in Bartolozzi red. Among the German exhibitors special mention should be made of the works by T. H. and O. Hofmeister, H. W. Müller, Otto Scharf, and others; whilst the Swiss school is well represented by Fred Boissonnas, who, thirte years ago, contributed largely to the International Photo Exhibition Kelvingrove. The room in which the photographic section is displa has been very tastefully decorated and furnished with a large num of chairs, which make it a delightful retreat from the heat a bustle of the various departments of the Exhibition, and since opening large numbers of visitors have eagerly scanned the cho examples spread out before them. As to the hold which photogra has upon the public generally, there can be no manner of doubt, an glance at the keen interest taken in the photographic section sho unmistakably that among all classes of society there are those who ta a deep interest in the work.

Throughout the various foreign chapels will be noticed some b attempts to produce striking effects, and, although to many mir several of these productions may not appear so acceptable as the m commonly seen specimens of photography, still these photographs interesting as showing the leaning of a few foreign workers in t respect. It must not, however, be supposed that the bulk of t exhibits partake of this particular character. Such, indeed, is ve far from being the case; but what examples there are go a long w in emphasising them by reason of the contrast they present wh viewed in close proximity to what many deem the more healthy p ductions of the older school. In the framing of many of the exhib there is also much that many of the old school of workers would c in question. In former days it was the custom for the frame to more or less subservient to the picture, but within recent years sm pictures, say, of three or four inches in extent, are provided wi frames the moulding of which is more in keeping with a full-leng oil painting. It has been stated that many an indifferent picture h attracted attention by reason of the "outre" nature of the fra containing it, and the question is sometimes asked, whether it is t frame or the picture that is deserving of the greatest attentio Happily, however, there is not much of this sort of thing en eviden in the Exhibition. Still, nowadays, there are not wanting tho workers who strive to make photography accomplish as much from sickly sentimental point of view, as the painter accomplishes by mea of pigments and brush. This a photographer never will accomplis however much he may strive after effect with the materials he po sesses. There is no doubt the custom of framing photographs for e hibition purposes without any white margin has caught on to a lar extent with many workers. Why such should have so transpired h been a puzzle to many. It would perhaps be going much too far condemn the practice entirely, for there are, and undoubtedly ha been, instances in which such a method of framing a series of pictur has been highly commendable. Such, for instance, as the magnifice series of portraits of the Judges in the Court of Session, by Mr. Crook of Edinburgh, but even in this striking exhibit, seen years ago, if w mistake not, there was some relief by means of a very narrow slip gold just inside the moulding. It does not follow, however, th because such giants in photography as Mr. Crooke and others adopt f special reasons a particular style of framing, that every one should blin foldly follow such examples in every other class of work, and it is ve strange indeed to find individuals framing identically the sam pictures in quite a different manner when they are required for wh may be termed non-exhibition purposes, or, in other words, for co mercial use. Then the style of framing partakes of the older fo with more or less margin. Is it that the public are not educated to this advanced style? At any rate, passing from the Fine A Section to the very large amount of photographic work display throughout the length and breadth of the Exhibition, hardly a sing example of the marginless style of framing is to be seen. Hand came work is conspicuous by its absence, and, in striking contrast to thirte years ago, there is an entire absence of photo-mechanical work, whic at that period was fast coming into popularity. Since then very pr nounced advances have been made in this branch of photography, an it seems a pity the Photographic Committee should not have see their way to have gathered together some of the best work produce over the last decade, even although the same could not, in a sense, b deemed other than mechanical production. Passing to what may b termed the commercial display of photography visible throughout th entire Exhibition, it may well be asked, "What would the Exhibitio have done without photography?" for were it not for this now indi pensable science the entire show would lack much of its brightness an adornment. Enlargements would appear to be the most strikin feature of the commercial display, and, truly, there are some exceed ingly fine and clever productions in this particular branch when looke at from a commercial standpoint. One striking instance is shown b the West Highland Steamship Company, where Mr. David Macbrayn shows an enormous enlargement of his celebrated steamer "Columba, the original image being only about two and a half inches in extent, ye still this is shown enlarged to six feet. Other very striking example of marine work are shown by Messrs. Denny and Co., of Dumbarto and Messrs. Donald Currie and Co., of the Union Castle Line. I fact, hardly an important industry is to be found in which photo

* I find that in 1888 a series of experiments was made in the Photographic Office, S.I.D., Calcutta, with Poitevin's, Sabatier's, and other processes of making reversed positives with wet collodion, with the result that the only one likely to be of practical use was that described by Capt. Biny, in the "Bull. Soc. Franc. de Photographie," xxvii. 130. With gelatine dry plates, it was found that hyposulphite of soda in the developer, or preliminary treatment of the plates with bichromate of potash, seemed to have little influence in causing reversal. The best reversals were obtained by a simple over-exposure of about 1800 times normal, or 30 minutes for an "ordinary" plate. This agrees with results lately obtained by Dr. R. Englisch.

aphy does not lend most valuable aid, and in a future notice we ›pe to refer more particularly to this commercial aspect of this ıtter, which, to professional photographers generally, must be quite important as the more curtailed Fine Art Section of the work.

The photographic dealers who have seen fit to take stalls and show-ses in the Exhibition, strange to say, are not numerous. The Albion lbumenising Company have a very complete exhibit in close proxi-ity to the Machinery Section. This includes some exceedingly sen-ble forms of cameras, from the smallest to the largest size, and most every other item required in practical work connected with ıotography is likewise displayed in the best form. The stall is stefully adorned by a few exceedingly choice photographs showing oonlight effects taken by a Llandudno professional worker. Messrs. eorge Mason and Co.'s exhibit will be found in the main industrial venue, and includes a magnificent collection of lenses by the eminent rm of Messrs. Ross and Co., of London, likewise microscopes and rismatic binoculars by the same firm. These are of special design. hey also make a speciality of cameras of their own manufacture, all of hich bear the stamp of practical utility, and likewise a fine specimen f a cinematograph, also made in their own workshops. This is com-osed of solid brass, everything being designed to ensure the utmost ability possible. The showcase also contains splendid specimens of ıe numerous chemicals and other necessary requirements in photo-raphy for which the firm has been so long celebrated. Messrs. Rae Brothers, of Glasgow, Perth, and Paisley, have erected an exceed-ıgly fine photographic cabin on the north side of the main avenue, in lose proximity to the entrance to the Fine Art Palace. To say that verything requisite in photography, and perhaps a good deal more, is › be seen here is not over-stating the exhibit. There are some strik-ıg examples in large portrait lenses, in fact it would be difficult to ıention the name of any London or Continental lens-maker whose pro-uctions are not displayed. All forms of hand cameras and stand ameras are on view, including "The Royalty Camera," the work-ıanship of which is beyond criticism. In addition to the enormous umber of lenses and cameras and other photographic requirements, he firm have a splendid display of lime-light and cinematographic pparatus, much of which is new and novel. The three Glasgow ealers who have done so much to cater for the general public are to be omplimented for the fine displays they make in the Exhibition. trange to say, the Executive have not seen fit to provide what may e termed a public dark room in the Exhibition. Considering the normous number of photographers that are daily visiting the Exhibi-ion, this must be deemed an oversight, and it is hoped that repre-entations will be made to have the omission rectified. Visitors to Glasgow, however, will only have to call on any of the dealers, who vill at all times place their dark rooms at their disposal. The names f those opticians whose business premises are in direct line with the oute to the Exhibition are well known. These include all the Buchanan-street firms, those also in St. Vincent-street, whilst Messrs. W. J. Hassard and Co., at 209, Sauchiehall-street, will, owing to their eing on the direct line of the chief promenade westward, doubtless e convenient to a large number going by that thoroughfare; whilst Messrs. Rae's West-end establishment at Charing-cross is quite near he east end of the Exhibition. A glance at any of the opticians' or lealers' windows will see "dark room" displayed, and tourists know vhat such means. All are welcome.

News and Notes.

At the Royal Photographic Society's Technical Meeting, Tuesday, May 28, at 66, Russell-square, at 8 p.m., Mr. E. Howard Farmer will read papers upon "Practical Tricolour Photography," and "The Optics of Tricolour Photography." The exhibition of Monsieur Robert Demachy's photographs, at 66, Russell-square, will close on May 31. Until then they may be seen on presentation of visiting card daily from 10 to 4 (Wednesdays, 10 to 8).

The Eclipse of the Sun.—A telegram from Port Louis (Mauritius) states that the total eclipse was well observed at the Royal Alfred Observatory, Mauritius. The partial eclipse was partly lost owing to cloud. The first contact was entirely lost, but the last three contacts were well observed. The party at the observatory included twenty-two observers. In all, fifty-two photographs of the corona were obtained with the photo-heliograph of the Mauritius Observatory, the Greenwich coronograph, the Newbegin telescope, and other smaller cameras. Forty-one photographs of the partial phase were also taken for the diameter and place of the moon, and eighteen photographs were taken of the spectrum. Mr. Piggott drew the corona with the six-inch equatorial, and Mrs. Ireland drove the Maskelyne kinematograph. Mr. Caxton had organized a scheme of meteorological observations over a wide area for the detection of evidence of an eclipse cyclone. The corona was of the expected minimum type, but seemed fainter and yellower, more diffused, and less definite than in the eclipse of last May.

Studio Gossip.

The Protection of Negatives.—The "Photographische Chronik" recommends, as a means of protecting negatives against damp, a solution of 30 grammes of paraffin dissolved in 100 c. c. of benzine. The solution should be applied with a brush. When the film is dry, warm the negative and rub it gently with a clean duster. Negatives prepared in this manner may be immersed in water for several hours without being affected in the least.

The Right to one's Portrait.—According to the "Photographische Chronik" a noteworthy action has been fought in Hamburg. A lady who sought to divorce her husband, engaged a private detective to obtain evidence, and the latter in the course of his investigations used a hand camera to photograph a young lady he had watched for some time. She sued for destruction of the negative and the prints and a penalty of £25 in the event of any of the latter being circulated. The case was not decided by the judge upon the right to one's portrait, but upon the ground that no evidence had been offered that the plaintiff was a dissolute woman. She had suffered an injury to her reputation and was entitled to protection.

Commercial & Legal Intelligence.

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for May has been awarded to Mr. John Tims, Cleeve Cottage, Chessington-road, Ewell, for his negative—"Azaleas."

The Thornton April Competitions.—The prize of a folding camera awarded for the best negative on Thornton films, has been won by Mr. G. F. G. Greening, of London, S.E. The cash prizes for the best prints on Thornton papers have been awarded as follows:—First prize—Mr. E. J. Matthews, of Chelmsford; second prize—Mr. E. Smith, of Harpurhey, Manchester; third prize—Rev. E. Clark, of Gloucester.

Two Months for a Canvasser.—John O'Brien, a photographer's canvasser, was charged at the Liverpool Police Court on Thursday, last week, with stealing half-a-crown, the property of Mary Gosling. It appeared that prisoner represented that he was a photographer's canvasser, and she paid him half-a-crown, in order that her baby's photograph might be taken. He was arrested at Derby, and in reply to the charge stated that it was the first time he had been in trouble for twenty-five years. The mayor said there was a long list of previous convictions against the prisoner, and he would be sentenced to two months' imprisonment.

Burglary at a Photographer's.—A daring burglary was effected on the night of the 14th inst., at the premises of Mr. Wakefield, photographer, at the corner of High-street and Lancaster-road, Ealing, within a stone's throw of the police station. The thieves obtained an entrance by climbing on a glass covered out-building, and breaking a window on the first-floor. The till was broken open, and the contents stolen, and a number of valuable lenses were removed from the cameras, but, fortunately, the thieves left them on the stairs. An unsuccessful attempt was also made to break open the safe. The burglary was apparently carried out by somebody acquainted with the premises, who knew where the money was kept.

The Warwick Competitions.—The following is the list of awards of the Warwick Competition for May:—£10 prize—H. E. Hopkins, St. Andrews, Tunbridge Wells, "Varenna;" £5 prize—C. Beach, Matlock-road, Meads, Eastbourne, "Eastbourne Hunt Point to Point Races;" £1 prizes—Bainbridge and Baldwin, photographers, Colne, "Wrong Somewhere;" A. E. Burnett, Collingwood-road, Redland, Bristol, "The Meadow Stream;" W. Chadwick, Trafalgar-street, Ashton-under-Lyne, "Interior Sculpture Gallery, Chatsworth;" A. W. Cooper, 9, Jordan-street, Preston, "The Billowy Mountains of the Air;" C. A. Courtenay, St. Peter's Vicarage, Tunbridge Wells, "A Milkmaid;" J. A. Draycott, photographer, New-street, Birmingham, "Head Study;" A. Durn, photographer, Wotton-under-Edge, "A Platinotype Portrait;" E. J. Edwards, photographer, Sparkbrook, Birmingham, "Child, full figure" E. J. H. Felce, Lea-road, Northampton, "Prior's Door, Ely;" E. B. Greenaway, West Bank, Stamford-hill, London, N., "Cottages in Lane;" W. C. Hope, Park-road, Cowes, I.W., "Quiet Waters;" P. Morley, 9, Lansdowne-circus, Leamington, "A Pair of Pups;" B. G. Narischkine, St. Charles-square, Notting-hill, London, W., "The Nile, Egypt;" T. R. Nunn, Filey-avenue, Stoke Newington, London, "Statue of Richard Cœur-de-Lion;" G. Scadding, Beethoven House, Newport, I.W., "Small Machine Shop;" A. Senior, Ashfield, Heckmondwike, "The Old Handloom Weaver;" A. Shaw, Stamford-street, Ashton-under-Lyne, "Statuary, Chatsworth;" W. E. Topping, Chestnut-gardens, Belfast, "A Fast Trotter;" W. Walker, Jocelyn-avenue, Belfast, "Shoeing the Donkey;" and F. G. Young, Alexandra-road, Penzance, "Newlyn Harbour."

Patent News.

The following applications for Patents were made between May 6 and May 11, 1901:—

Binocular Cameras.—No. 9318. "Improvements in Telescopes, Binoculars, Cameras, and the like." Thomas Thorp.

CAMERAS.—No. 9630. "Improvements in Photographic Cameras, and in Appliances to be used in connexion therewith." HENRY WILLIAM JAMES.

FILM ROLLERS.—No. 9649. "Photographical Casket for Film Rollers." Complete specification. WILLY BEUTLER.

ANIMATED PHOTOGRAPHY.—No. 9714. "Improvements in exhibiting Animated Pictures and Films and Apparatus therefor." WALTER WILKINSON.

RELIEF PHOTOGRAPHS.—No. 9763. "Process for producing Pictures in Relievo on Metal, Celluloid, Gypsum, or the like by means of Photography." WILHELM OHSE.

PRINT AND PLATE WASHER.—No. 9426. "Photographic Print, Film, or Plate Washer." BORIS G. NARISCHKINE.

ARC LIGHTS.—No. 9702. "Improvements in Arc Lights for Photographic Purposes." FREDERICK GRAHAM NOTLEY.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
27	Borough Polytechnic	Excursion: Goring-on-Thames. Leader, E. W. Burch.
27	Croydon Microscopical Society	Excursion: Hever and Tonbridge. Conductor, the President.
28	Birmingham Photo. Society	Demonstration: *Survey Methods and Survey Work*. Messrs. G. Whitehouse and P. T. Deakin.
29	Croydon Camera Club	Lantern Lecture: *Floricultural Photography*. John Gregory.
29	G.E.R. Mechanics Institution	Social Evening.
30	Camera Club	*Crystallography in Colours*. T. Charters White.
30	London and Provincial	Paper by A. Haddon.
30	Oldham	*Failures and their Remedies*. J. Siddall.
June. 1	Hull	Excursion: Stallingborough—Corporation Pier. Leader, J. R. Boyle, F.S.A.

ROYAL PHOTOGRAPHIC SOCIETY.

ORDINARY Meeting, May 14,—Mr. Thomas R. Dallmeyer, F.R.A.S., President, in the chair.

GENERAL BUSINESS.

Nominations in favour of six candidates were read, and four gentlemen were elected members of the Society.

It was announced that the Hove Camera Club had been admitted to affiliation.

HONORARY FELLOWSHIP.

The President reported that the council had, at a recent meeting, conferred upon Colonel Joseph Gale the Honorary Fellowship. It will be remembered that Colonel Gale early in the year had an exhibition of his work in the Society's house.

PRESENTS.

An excellent portrait of the late H. P. Robinson, presented by his son, Mr. Ralph Robinson, was laid upon the table.

Mr. John Leighton, F.S.A., presented a volume, published in London in 1849, containing "specimens of portraits engraved in Spain during the seventeenth century, and now reproduced by the sun." The engravings are copied by the Talbotype process, and the prints were executed by Henneman and Malone. Some of the impressions are faint and will, as the donor fears, eventually entirely fade away.

Major-General J. Waterhouse, I.S.C., read a paper entitled—

NOTES ON THE EARLY HISTORY OF THE CAMERA OBSCURA.

The author commences—"If there is an article of faith which the orthodox photographer has been taught to believe without question, it is the invention of the camera obscura by the famous Neapolitan savant of the sixteenth century, Giovanni Baptista della Porta. Even in the earliest days of photography doubt was thrown upon his claims by Libri, in his 'Histoire des Sciences Mathématiques en Italie,' Paris, 1841, but the information given therein about the earlier work of Leonardo da Vinci, Don Panuce, and Cardan, does not seem to have attracted any general attention to this country, though it is noticed by Dr. Eder in his 'Ausführliches Handbuch,' Vol. I., Part II., p. 35, which contains the most complete history of the camera yet given." General Waterhouse has, however, lately verified the fact that the principle of the instrument was well known and in use before the time of Porta, and that he was anticipated by Cardan in the use of the concave spectrum, and by Barbaro and Benedetti in the use of the convex lens, both of which improvements Porta announced as secrets of his own discovery. As an attempt to bring together for the first time a connected history of the instrument, now so great a power in the land, General Waterhouse's efforts will be highly appreciated. In the early part of the sixteenth century, before Porta's time, the camera obscura seems to have been well known in Italy. Leonardo da Vinci in an unpublished MS. gives a clear description of it. Cæsariano also comments upon and describes before 1520 the projection of images of outside objects on paper through an aperture in a darkened room, the discovery of which he attributes to a Don Panuce whom the reader of the paper had been unable to trace. However, here are two very clear descriptions of the camera obscura without a lens written before Porta was born. The arrangement was in practical use in Germany for the observation of eclipses by Reinhold and Gemma Frisius, between 1540 and 1545. The camera with lens was developed and brought into practical use by Rimer, Kepler, Fabricius, Scheiner, Zahn, and others. General Waterhouse has not been able to discover when the camera was brought into England, but it was known here in 1658. It was first applied to a photographic process by Wedgwood, in 1802.

In presenting this contribution to the history of our principal photographic instrument, which never yet seems to have been thought worthy of a history, the author says that he believes he has got most of the available information regarding its discovery and early use, but there may still be some hidden away, as Barbaro's discovery has been for so long. Though the question of the invention is of no great importance, in seems desirable that the facts, so far as we can ascertain them, should be placed on record.

There is a mass of references and appendices to the paper containing the original Latin and Italian writings which add greatly to the value of the research.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 16,—Mr. W. T. Wilkinson in the chair.

Mr. E. T. Wright showed some prints from negatives made in a camera which was passed round, all being spoiled by a clear spot or patch in a particular place, the cause of which he could not trace or suggest.

The meeting could not offer any explanation and the subject dropped.

Mr. A. L. Henderson, who had just returned from a long sojourn abroad, said that at Venice he had an opportunity of photographing the opening ceremony at the exhibition a fortnight before. It was quite impossible to use the camera in the ordinary way owing to the dense crowds, but by lifting the camera up above his head by means of the legs he succeeeded in getting one or two very good photographs.

PHOTOGRAPHIC CLUB.

MAY 15,—Mr. J. W. Mason in the chair.

A discussion upon copyright in photographs was opened, and some satisfaction was evinced in the fact that the proposed Bill dealing with the subject, although considerably amended, was not before the House. It was thought better to remain content with what photographers already had.

Details of a recommendation by an American writer to his countrymen when in England to expose two plates—one of British and the other of American make—on every view, in order to comply with certain copyright laws, were considered curious, but failing other particulars the matter dropped.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK, LIMITED, AND THE TRADE.

To the EDITORS.

GENTLEMEN,—I think all who have read the circular issued to photographic dealers, and published in THE BRITISH JOURNAL OF PHOTOGRAPHY, will agree with me that it is about as plausible a piece of sophistry as was ever put together, unworthy of a great company, and subversive of all the best traditions of British trading. If the desire of Kodak, Limited, was to protect the dealer from cutting and underselling, and nothing else, such a position is understandable, and has been taken up in other lines of business; but they go far beyond this, presume to choose such dealers of whom they approve, and then compel such dealers to stock only their goods. If this is not coercion and interference with legitimate trading, I should like to know what is? But even this is not all, for it must be remembered that Kodak, Limited, are themselves retailers, and appoint special agencies of their own as adjuncts to the stationery and other businesses, and yet they pretend to be very solicitous of the interests of photographic dealers. There are already plenty of cameras, quite as good, if not so extensively advertised as the Kodaks, and it is strange indeed if British manufacturers cannot compete with Kodak, or even beat them on their own ground. Already there are roll-holders in the market quite as good as Kodak's, and any one who could invent a film to supersede the highly inconvenient celluloid roller film would confer a benefit on all photographers. Of course, I am mindful of the Sandell-Cristoid film,

which, at any rate, never curls up like celluloid; but something that shall entirely supersede roller celluloid is what is wanted; the same objections do not apply to flat films. I am very pleased to see that the various photographic societies all over the kingdom are actively taking this question up, and trust that the result may be the entire withdrawal by Kodak, Limited, of their obnoxious conditions of purchase and sale.—I am, yours, &c., J. H. BALDOCK.

To the EDITORS.

GENTLEMEN,—The following resolution was passed by the Photographic Section of the Croydon Microscopical and Natural History Club on the 10th inst.:—"That this meeting desires to express its strongest disapproval of the action of Messrs. Kodak, Limited, in attempting to interfere with the freedom of the dealer, and is of opinion that such action is inimical to photographic progress in this country."—I am, &c., E. PIERCE, Hon. Sec.

Photographic Section Croydon M. and N. H. Club, May 14, 1901.

To the EDITORS.

GENTLEMEN,—At a meeting of the North Middlesex Photographic Society, held on the 20th inst., a letter from Kodak, Limited, was read, in which they stated that the Society's resolution recently passed was based upon a misapprehension as to facts. The following reply was authorised to be sent to Kodak, Limited:—"That we acknowledge the receipt of the letter from Kodak, Limited, dated the 9th inst., and in reply state that, after giving it our careful consideration, we see no reason to withdraw from the position taken up in our letter of the 7th inst., and further, we now, as a Society pledge ourselves to abstain from using any of the Kodak Company's productions until the restrictions complained of are withdrawn."—I am, yours, &c., R. R. RAWKINS, Hon. Sec.

May 20, 1901.

To the EDITORS.

GENTLEMEN,—At a meeting of this Society, held May 14th, the following resolution was carried unanimously:—"That this meeting of photographic cabinet-makers protest against the unfair conditions of trade the Kodak Company wish to impose on dealers in their goods, as they think monopoly quite as bad as unfair competition."—I am, yours, &c., WILLIAM WOOD, Secretary.

Photographic Cabinet-makers' Society, "Two Blue Posts,"
Mount Pleasant, W.C., May 20, 1901.

The meeting of the London and Provincial Photographic Association on Thursday, May 16th, was to have heard an explanation of the Kodak Panoram camera which was laid upon the table, but at the outset some opposition was offered, and a lengthy discussion ensued. The action of Kodak, Limited, in dictating the well-known terms to the trade respecting the sale of Kodak goods was severely criticised, and eventually a resolution strongly protesting against the attempt of Kodak, Limited, to introduce their coercive methods into their business dealings with the British trade was adopted. At the same time it was agreed that the Association could not, while such attempts continued, examine or discuss the camera in question, which the Secretary was instructed to return.

[IN the concluding words of the temperate and dignified letter of the Photographic Trade Association, which we published in last week's JOURNAL, we "still hope that Kodak, Limited, will, in face of the strong expressions of opinion daily accumulating against them, withdraw their new conditions without reserve and rely upon the quality and price of their specialities to meet competition and improvement." As it is exactly two months since the publication of our article deprecating the Kodak policy, it may be desirable, in view of what has occurred in the interval, to recall to our readers' notice the opinion we then formed on the situation. Under date March 29 we wrote:—"Until quite recently we should have scouted the idea that the Kodak Company would voluntarily endanger the unique position which it has deservedly won by the aid of supreme technical skill and splendid business enterprise. But, to our surprise, and we will add regret, the security of that position has been shaken by the company's own act and deed. In effect, some thousands of firms who sell Kodaks have been told they must not supply any but Kodak rollable celluloid films for use in those cameras, and that a disregard of these conditions entails a suspension of the agency. This grave step of the Kodak Company is hard to justify, we think, on any ground, not excluding that of abstract business principles. It is a step which we urge the company, in its own immediate and future interests, to retrace with all possible speed. The bare legal right of a manufacturing firm to impose its own terms on its agents being conceded, the wisdom of a literal insistence on such a right is always open to doubt, and very seriously so in the present case. There is no blinking the fact that, although the season of the year, when the busiest sale of photographic supplies is about to open, is not favourable to active resistance in the majority of cases, hundreds, if not thousands, of photographic dealers will nourish a more or less secret resentment against the Kodak policy, and the practical outcome of that resentment may have the most disastrous effects on the future of the company. Already it is apparent that other film manufacturers have been stirred into the greatest activity; there are many clamours for Kodak 'substitutes,' and the promises of early competition from Germany and France. This state of things, which is full of menace to Kodak, Limited, could, and we hope will, be ended by a stroke of the pen. The very things the company must naturally be anxious to obviate and avoid, viz., a far-reaching antipathy to Kodak films, cameras, and papers, and the provocation of a keen, if not ruinous, competition, must, it strikes us, follow the recently inaugurated policy as certainly as the night follows the day. They are inevitable. On the other hand, the withdrawal of that policy and the prudent conservation of the great trade it has created will still enable Kodak, Ltd., to hold the field as the premier house of its kind, and to exist in harmony with its British competitors, let them be plate, film, or paper makers; or indeed any class of photographic manufacturers. There is room for all. . . . We desire again to suggest to the Kodak Company that it will best consult its own interests and that of photography at large, by retiring from a position which places it in antagonism to the most cherished privilege of British trade, that of freedom of contract. Although there is so much credit due to the company for the immense developments it has already promoted in many branches of photography the possibilities in front of it are, we believe, greater than ever they were; and, therefore, we should be sorry to see any obstacle placed in the way of its continued progress." Our anticipations have proved correct. The resentment of the Kodak policy, and the antipathy to Kodak productions, are obviously now so widespread that, although the company may for a time hold its own by "discontinuing its price maintenance policy" and multiplying its retail branches, the united antagonism of the trade and the public is bound, in the long run, to prevail against it. In face of an opposition in the photographic world which can fairly be called unanimous, it would be prudent of the Kodak Company, we think, to recognise that the situation can only be saved by the unreserved withdrawal of the objectionable conditions of sale. Such well-known photographic members of the Board as Sir H. T. Wood, Mr. Andrew Pringle, and Mr. Davison are in a position to inform their colleagues of the extent to which the Kodak policy is resented by the photographic trade and public, and the frank recognition of a fact of such undoubted gravity by a Board of business men should at once lead to the adoption of more conciliatory measures. The plain issue, which is not devoid of sentimental aspects, lies between a single company and a great trade, backed up by the still greater public which supports it. We are not in sympathy with some of the methods that have been devised for persuading the Kodak Company that they have taken a false step; but we are nevertheless firmly of opinion, based upon a lengthy experience of photography, that while a stubborn persistence in the obnoxious policy will not injure British photography or photographic progress in the slightest degree, it must ultimately lead to the downfall of the Kodak Company, a catastrophe that can be easily averted by a withdrawal from its present unpopular position. Our correspondence columns are, of course, still open to a further ventilation of the controversy.—EDS. *B.J.P.*]

ON DIFFRACTION WITH SMALL STOPS.

To the EDITORS.

GENTLEMEN,—In the "Summary of the whole art of using a telephoto combination," as quoted in your article of May 10—with much to commend and a little which it would not be fair very closely to criticise—there is one direction, No. 11, on which I should wish to comment, for, while it will come with some authority to most readers, it embodies what I believe to be a widespread fallacy, likely, I fear, to be really injurious to such energetic and original workers as most earnestly aim at the best possible optical definition under such difficult circumstances as sometimes occur, as worthy knots to be untied. It

is there laid down that a tele-photo lens should not be used at an aperture less than *f*-72, because of the loss of definition by diffraction.

It seems curious that an exaggerated idea of the practical effect on a photograph of the diffraction caused by a small aperture has generally come from opticians. Monckhoven actually recommended nothing smaller than *f*-40; and I remember that his authority was pleaded very earnestly by an operator of mine some thirty years ago, whose surprise I also remember when he saw the excellent practical effect of disregarding that advice. At the other extreme, I notice that Mr. Chapman Jones, employing a formula by Captain Abney, found the most suitable aperture for pinholes, taking diffraction into account, to vary from an aperture of 1-16 in., with a distance of 64 inches (=*f*-1024) to one of 1-64 in., with a distance of 4 inches (*f*-256).* Had something like this latter intensity been suggested as the extreme limit practically advisable, I should have felt inclined to agree with the writer. I have gone beyond it myself in some very extreme cases, but I cannot say it has been always with marked advantage. Perhaps I may remark here that it is, I think, perfectly correct to estimate this error simply in terms of intensity. Neither actual aperture, nor actual or equivalent great length, need be considered, but only their relation to one another.

In astronomical observation—especially in the separation of double stars—this cause of indistinctness has long been known, and a rough practical estimate of its value is, I believe, fairly familiar. It is a fact that a well-corrected objective of one inch aperture suffices, with adequate magnifying power, to separate double stars whose components are five seconds apart; but fully five inches would be required for separation if the distance did not exceed one second. I believe these facts would be generally and fully admitted, and it would also, I believe, be admitted that the separation of two closely contiguous points of intense light, on an intensely dark background, is a condition very favourable to the error, and very unfavourable to the distinctness of optical definition affected by it. The definition of contiguous points less strongly contrasted will be better, not worse.

Now, what is the measured value of five seconds on a focal length of 100 inches (i.e., *f*-100, with one inch aperture)? It is, as near as may be, 1-412 inch. So that, if we take 1-200 of an inch as fair optical definition (some have taken 1-100 inch, but few will be satisfied with that), half-inch aperture (=*f*-200), is amply sufficient to prevent any sensible loss of definition arising from diffraction, even for centrally-incident pencils in the best part of the image; while, towards the margin, or at the upper and lower parts where it has been necessary to use a swing back, the best central definition might well be sacrificed to some extent, if considered desirable, in order to improve marginal definition by stops smaller still. But, though I have repeatedly stopped down to *f*-300 in very extreme cases, and might do so again, I cannot say distinctly, from my own, perhaps unusual, experience, that I should be justified, from experience alone, in laying down even *f*-300 as an extreme limit. At the same time these very small stops are very difficult to use and to focus accurately, and a more moderate limit is perhaps practically advisable with the ordinary small plates, so that *f*-72 may be quite enough for ordinary practical use with the ordinary focussing screen—though not because of diffraction. But photographers who use large plates find depth of focus a very much more serious thing, and those who desire to obtain fine optical definition on large plates by using a very small stop, will do wisely if they dispense with ground glass, and habitually use a good magnifier to focus with. Also, where possible, a view of the image itself without even plain glass intervening is best of all. My own plan is generally to use only a movable strip of plain glass, against which I may rest the edge of my magnifier, previously adjusted to accurate definition of the further surface of that glass. And an inquirer, experimenting with minute apertures, may, by this method, be able to recognise the enormous difference between any perceptibly injurious effect of a very small aperture on visual definition, and the very different photographic effect. For in the photograph deficiency of light can be compensated by a longer exposure, and it is the image unmagnified by the focussing eyepiece which is received on the sensitive plate, and is eventually printed, always losing something in the printing.

I feel especially jealous of any limitation of stops for tele-photo combinations. Some two or three years back I proposed to myself to write a full description of my own tele-photo arrangement, with extemporised convex magnifiers applied to a primary combination—itself of long focus, with which I used quite small stops. But, though fairly successful in the work for which I had planned and constructed my combination, I found no sufficient leisure for experimenting, even in combining further the lenses I had by me, while to plan curves, &c., was totally out of the question. I could not finally recommend any particular combination as distinctly the best, and pressure of other work caused me to set it aside until again required. Nevertheless, whenever the careful photography of statues, &c., awkwardly placed, becomes a real desideratum, my method will reward attention. It is worth noticing that whereas an ordinary swing-back should be adjusted one way to correct distortion, and generally the opposite way to get the best focus—the requirements of an image that has been re-inverted by a convex magnifier, and is consequently upright, are not similarly contrasted, so that a better result is thus attainable than is possible in the ordinary position. A proper separation between the lenses of the magnifier has also an important effect, not only by a peculiar compensation correcting even the secondary spectrum of achromatic magnifiers as regards the bending of excentrical pencils passing through them, but also by a very similar compensation partly, or wholly, correcting the distortion in a manner still further reducing the necessity for swing-back adjustment, which, for this particular work, had to be applied to a great extreme, the necessary tilting of the camera being excessive. But this whole subject really calls for more attention than I believe it has ever yet received.

Allow me further to add that if the writer of the "summary," one article of which I have ventured to criticise, or any one else specially interested, should visit Oxford next July, and will call on me, I shall be happy to show him negatives, &c., tending to confirm what I have said.—I am, yours, &c.,

W. H. Wheeler.

106, High-street, Oxford.

* "Introduction to Science and Practice of Photography," page 160.

COLLODION *V.* GELATINE NEGATIVES.

To the Editors.

Gentlemen,—As it fell to my lot last week to go through a number of negatives taken during the past fifty years, it will not be out of place for me to give, in response to your article on this subject, the result of my observations. In the great majority of cases the collodion negatives confirm your statement. They are as good as ever; but this cannot be said of the gelatine ones in anything like the same proportion. There are some that have been done a great number of years that do not appear to have changed, and this suggests "What is the cause why so many others have?" I am inclined to think that the main cause is to be found in the imprisonment of hypo in the gelatine. You are aware that the advice has been given by dry-plate makers to use alum after fixing, i.e., after the negative has been washed. I am disposed to think that this interim washing has been generally insufficient, with the result that the hypo has been the more easily imprisoned, although the general idea is that the alum produced a decomposition of the hypo. Beside this fading, I note in some a general reticulated stain, which appears to indicate the presence of some undissolved silver. This, too, may be caused by too early an introduction to the alum bath. This seems also borne out by the fact that a large series which were taken, and no alum bath was used with them, show by far the greater proportion of freedom from this particular stain and fading, though some of these show a stain even throughout as if pyro. It will be interesting to read the experiences of others in this direction. I may have a word to say further on.—I am, yours, &c.,

Old Professional.

THE GLASGOW INTERNATIONAL EXHIBITION.

To the Editors.

Gentlemen,—In your issue of the 10th inst., there appears a letter by Mr. J. C. Annan, calling in question the accuracy of a report regarding the press view of the Photographic Section of the Glasgow International Exhibition, which appeared in your issue of 3rd inst.

In the first instance, Mr. Annan disclaims having said that he considered the collection of photographs the finest ever brought together. Had I been the only press representative at the private view on the 25th ult. who so reported what transpired at that function I should not have troubled you with this reply. I find, however, other reporters (who are absolutely unknown to me) express themselves in almost identically the same words as I used when their comments appeared in the Glasgow Press. On referring to the notes taken in the room, which were written whilst Bailie Crawford was speaking when introducing the press representatives to Mr. Annan, the Convener of the Photographic Section, I find I have noted down the following words:—"I have Mr. Annan's authority (and there is no better authority in matters photographic) for saying this is the finest collection of photographs ever brought together in the world." Mr. Annan was present when Bailie Crawford made this statement, and in his reply he took no exception to what Bailie Crawford had just stated on his authority. I, for one, certainly considered Mr. Annan had so expressed his opinion regarding the collection we were viewing, and, as previously stated, other reporters present seem to have formed exactly the same opinion as myself.

Mr. Annan's second objection relates to the statement that it had been found impracticable to hang the foreign exhibits all by themselves. Fortunately here we have an objection which can be discussed from a point of ocular demonstration, as well as facts disclosed by the catalogue which was courteously handed to me by Mr. Annan himself, and upon which alone my report was based.

At the press view, I found, on referring to the catalogue, that in the first portion of the British section, which embraced 107 frames, there were at least seven, if not eight, exhibits catalogued bearing the names of foreign workers. These were numbered in the catalogue 52, 65 (twice), 68, 73, 88, and 90. Coming to the next chapel, I found the mixing up more puzzling still. The lower numbers, beginning at 108 and running up to about 123, were by American workers, but at this point a number of Russian exhibits appear, among which an odd American frame was thrown in, and I suppose just to give the dish a further flavour there appears in the catalogue an English exhibit, the subject being a South African War picture. At about 139 or 140 the collection was again by American workers, these running on to about 160. Then the French school of workers appears in the fourth chapel on the north side of the room; these run on in the catalogue to about 180, and then a large number of English exhibits split up the French collection, which is again renewed and runs up to about 220. The Belgian exhibits now appear, and then we have some more English or British pictures, then those from Germany, then more British, and the remainder were ranged round the south side of the room in a mixed condition also in so far as the different nationalities are concerned.

I am quite aware that since my first notice was written name-plates have been inserted in the various chapels stating the different nationalities of the exhibits displayed at those parts, and in a subsequent, or second notice written, I gave due prominence to this arrangement. But when the press were invited to the private view on the 25th ult. there were no name-plates erected, the catalogue was the only guide, and a perusal of such cannot fail to give any one the idea that the entire exhibits were mixed up, and I now fearlessly assert that if these name-plates were removed to-morrow, and the entire collection placed in the same condition as when viewed by the press representatives on the 25th ult., any one visiting the Exhibition could form no other opinion than I then formed, viz., that the various exhibits were mixed up.

So much for what the writer viewed at the press gathering, and upon which the report appearing in your columns was based. Yet Mr. Annan asserts the very contrary to be the case. Is Mr. Annan aware that even yet (and this after much has been done to rectify incidental mistakes in hanging and cataloguing and the addition of name-plates) several foreign exhibits appear under the name-plate Britain? These are Nos. 259, 257, 201, 202, 203, 200, whilst one very prominent American worker has a frame hung under the Russian name-plate.

It appears to me, therefore, I have adduced abundant proof of the accuracy of my report which appeared in your issue of the 3rd inst. I am quite aware that, incidental to all exhibitions, mistakes will occur in the hanging and cataloguing. Mr. Annan, however, should refrain from applying his blisters where they are not deserved.—I am, &c.,

YOUR REPRESENTATIVE.

THE TEACHING OF PHOTOGRAPHIC OPTICS.

To the EDITORS.

GENTLEMEN,—I am afraid that Mr. Newton's letter on this subject shows that he has not yet quite seized the point, but there is evidently no reason why he should not, if, in pursuing his inquiry, he will bear in mind that depth of focus and depth of field are two perfectly distinct linear dimensions.

The first (depth of focus) never amounts to more than a small fraction of an inch; it is practically equal with all lenses working at the same intensity; and is a matter of small importance to the photographer. On the other hand, depth of field may amount to anything from a foot to a mile (or more); it diminishes very rapidly with an increase of the focal length; and (especially to the hand camera photographer) it is a matter of considerable importance. The utility of knowing how to provide the proper amount and position of the depth of field is, of course, most apparent when working at close quarters, as, for example, in taking groups with a hand camera on board ship.

There is yet another cause of confusion on this subject which I may perhaps be allowed to point out. It is the introduction of terms which are unnecessary and unsuitable. For instance, Mr. Dallmeyer employed the term "depth of definition" to signify depth of field; whilst in a recently published treatise it is used as a substitute for depth of focus. This double use of the term cannot fail to be perplexing to a beginner. It is indeed difficult to see why the term should have been brought in at all, and still more so why it should be used as a synonym for either depth of focus or depth of field. It is equally applicable to both, since both are species of the same genus definition. The same remark applies to "penetration." "Depth of distance" is another term (and not altogether a bad one) that has been used to denote depth of field; but is there any necessity for it?

"Hyperfocal distance" is generally used in its proper sense, though I have more than once seen the term "fixed focus" dragged in as a substitute!—I am, yours, &c.,

W. B. COVENTRY.

May 17, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

W. E. J. Church, 119, High-street, W., Sunderland. *Photograph of J. E. Doig.*

L. Varney, Bridge-street, Buckingham.—*Photograph of a Yeomanry encampment.*

BOOK ON RETOUCHING.—A. F. M. asks: "What book do you recommend as the best treating on retouching only?"—In reply: Johnson's "Art of Retouching," published by Messrs. Marion, Soho-square. Price 2s.

PASSPORT QUERY.—H. BENYON says: "I hope to spend two or three weeks with the camera in Holland and Belgium about Whitsuntide. Can you tell me the regulations as regards passports?"—In reply: A passport is not necessary either in Holland or Belgium.

ADDRESS WANTED.—R. C. writes: "Will you kindly inform me where I can obtain a copy of 'La Photographie d'Art a l'Exposition Universale de 1900,' and the price of same?"—In reply: Of Messrs. Gauthier-Villars, 55, Quai des Grands Augustins, Paris. The price we have no means of ascertaining at the moment.

GUIDE BOOK TO SHREWSBURY.—"NORTHERN" writes: "Can you tell me the best guide-book to Shrewsbury and district, and, failing which, a good one? I want to read up the subject a little for a holiday next week."—In reply: Let our correspondent address Messrs. Adnitt and Naunton, Shrewsbury, who will supply him with a suitable guide-book.

THE GUM BICHROMATE PROCESS.—G. W. S. writes: "I shall be obliged if you will inform me the best text-book on the gum bichromate process?"—In reply: One of the best papers that has been written on the subject is by Mr. James Packham. It is printed at page 806 of the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1899.

BOOK ON WORKING UP ENLARGEMENTS.—"BLACK AND WHITE" asks: Is there any book dealing only with the working up of enlarge-process, if there are any, or the best source of information on the ments? If there is, where can I purchase same?"—In reply: Perhaps the chapters on finishing and colouring photographs that are given in Johnson's "Art of Retouching," may supply the needs of our correspondent. The book is published by Messrs. Marion and Co., Soho-square.

PORTRAIT OF MR. GLADSTONE.—"ACCRINGTON" writes: "I should feel very much obliged to you for a little information as to where I could send for the best photograph of the late Rt. Hon. W. E. Gladstone? The picture to be a bust figure, to work a large b. and w. drawing from."—In reply: Possibly our correspondent may be able to obtain what he requires from Mr. G. Watmough Webster, 33, Bridge-street Row, Chester.

MARKS ON SPOOL FILMS.—"NUMBERS" writes: "On a lot of spool films I have developed lately, the numbers on the paper backing show strongly in the negatives. Can you tell me how they are to be avoided?"—In reply: Yours is not an uncommon complaint. The trouble seems to be more prevalent with films that have been long made than with those of newer make. Better write to the makers, they may be able to suggest a way of avoiding them.

GUM BICHROMATE AND CARBON PRINTING.—Q. E. D. writes: (1) Will you please explain the 'gum bichromate' process? and (2) also in printing carbons; how one can print an outside border plain?"—In reply: (1) The gum bichromate process has often been described in the JOURNAL, and space is too limited in this column for us to repeat it. Better get the late Mr. W. J. Warren's hand-book on the subject, published by Iliffe and Co., St. Bride-street. (2) Simply by placing a cut-out mask on the negative.

A CARBON DIFFICULTY.—G. COSWAY says: "Can you tell me the reason why most of the carbon prints I develop on flexible support will not transfer? When they are dry the transfer paper sticks to the flexible support most tenaciously, and when pulled off by force more of the picture is left on the support than on the transfer paper."—In reply: The only reason we can see for the trouble is that the support has not been properly waxed. If you wax it according to the directions you should have no trouble with it.

PORTRAIT CLUBS.—"INQUISITIVE" writes: "Which do you consider the best way to manage a portrait club by weekly payments, and the best way to arrange in what order the sitters are to come?"—In reply: We must confess we have had no experience in the management of portrait clubs. We believe, however, that most of those who run them make their own arrangements and terms, according to their ideas. We are not aware that there are any set of rules in the business. Perhaps some reader can enlighten our correspondent on the matter.

INK STAINS ON PRINT.—G. R. C. says: "I had a print to copy and by some means a blot of ink got upon it and was not noticed till it was perfectly dry. Can you tell me how to get the ink off so that it will not show? The print is on P. O. P."—In reply: Without knowing the composition of the ink we can offer no suggestion. As the print is on a gelatine paper we are very doubtful if it can be removed without leaving a stain. Washing with water might possibly remove some of the ink, as some kinds of ink, when dry, are partially soluble in water.

REMOVING STAINS, &c.—"STAINS" asks: "(1) How to remove stains off finger-nails caused by toning-bath? (2) How to remove pyro stains from fingers? (3) The best medium containing advertisements of scientific situations, i.e., the best paper for scientific appointments?"—In reply: (1) The stains are probably due to the water from washing the prints, and they may be removed if they are at once treated with a solution of cyanide of potassium. But if you use it take care there are no cuts or scratches on the skin as it is a poison. (2) A solution of citric acid, followed by one of hypochlorite of lime—"bleaching powder." (3) "Scientific" is a very broad term. If you indicate the special scientific appointment you desire, we may possibly indicate the best medium to advertise in.

ADDRESSES WANTED.—W. F. writes: "Will you kindly inform me if the Rev. Alexander Fletcher (of Fletcher's 'Family Devotion') is still living, and, if not, how long he has been dead? His book was published by Virtue, 26, Ivy-lane, about the year 1846. Also if the Rev. J. Fleetwood (Fleetwood's 'Life of Christ'), published by Kelly, 1855, is dead? and, if so, how long? If unable to reply can you give me any information on the subjects, and where I can ascertain?"—In reply: It hardly falls within our province to answer such questions as these, which should properly be addressed to the "Christian World," or some similar publication. Let our correspondent consult a list of the religious papers, printed in Kelly's "London Directory," or any press guide, and make a choice of a more likely medium for inquiry than a journal devoted to photography.

AN OLD LENS.—"LENS" writes: "I have in my possession an old Chevalier lens, in fact it is in constant use, and appears to work well for bust pictures, and has been very successful with all other styles of portraiture. Is there any value attached to such a lens other than its working qualities? There are three stops belonging to it which screw into the mount. What is the meaning of the word 'Paysages' you will notice on one of the combinations? Diagram of lens enclosed." — In reply: We should say that the lens has no market value other than its working qualities, unless, indeed, some one wants such an instrument for a museum. "Paysages" indicates that this combination is to be employed by itself for views or landscape purposes. We do not remember having seen a lens of Chevalier's of the exact pattern of that depicted in the diagram. But he did not, we know, always adhere to the same form in all his photographic lenses.

ALBUMEN PRINTING, &c.—"ART" writes: "(1) As a constant reader of your valuable paper I take the liberty of writing to ask if you can help me over a difficulty which I have been trying to overcome for the past twelve months, and which, in spite of my repeated efforts, is still causing me as much trouble as ever? I abominate the plebeian P. O. P. from an art point of view, and am anxious to use albumen paper in its place for many reasons, but my great difficulty is in retaining the beautiful tones after the prints enter the fixing bath, where they invariably change to a dirty brown, dingy colour, and the word 'rich' is just the last adjective in the world that would apply to them. I get my paper from London ready sensitised, as I have no facilities for sensitising at home. I have tried various papers with the acetate, borax, and lime baths. Have resorted to various modifications of the baths, and have introduced a salt bath, and also one containing carbonate of soda at various stages of the manipulations in which I am most particular, but all to no purpose. Have also tried a fresh sample of hyposulphite of soda, but the result is still the same. I get some lovely tones in the toning bath, but when they have been in the fixing bath about three minutes all the rich purple and brown vanishes, and the result is a print that would bring discredit on a decent waste paper basket. I might also add that I have tried the fixing bath with and without the addition of ammonia. Can you suggest the cause, and a remedy for this falling off of colour? If you can I should be extremely grateful. (2) Will you also kindly tell me where I can secure that very high class picture moulding, one so seldom sees out of London, which is mostly of various plain woods, with just a fancy edge? I don't think it is the ordinary Cologne moulding, I believe it is American."—In reply: (1) We strongly suspect that you have been over-toning the prints. Some ready-sensitised papers will not bear toning beyond a deep brown without behaving as you describe. For rich purple colours a very vigorous negative is imperative. Try sensitising the paper yourself, using a sixty grain silver bath. (2) Mr. O. Sichel, 20, Berners-street, W., can, no doubt, supply the moulding you admire. Write him for patterns.

A RAPID PROCESS.—"PALMA" writes: "I have been a continuous reader of your JOURNAL, but regarding the subject I write to you upon I have not, as yet, perceived any mention in your pages. Last summer, whilst on my holiday, I came across a photographer who, for a charge of 6d., was taking what appeared to me to be a paper print, c.-d.-v. size, mounted and complete; the tone and general appearance of same much resembled a print on rose enamel paper; the whole operation, from exposure to delivery, did not occupy more than three minutes. Can you inform me the process, and name of same? If a proprietary one, what is the name and address of patentees?"—In reply: We know of no process answering your description. If you send us an example we shall be able to tell you, no doubt, how it was produced. We do not quite realise how a paper picture could be produced and mounted in three minutes by any process. Was not the photograph an ordinary ferrotype?

HYPO AND SODIUM SULPHITE SOLUTIONS.—R. B. MCKERROW writes: "(1) Does a solution of hypo keep good indefinitely, or, if not, what does it become? Many sets of instructions for various processes say 'use freshly-made hypo for each batch of prints,' &c., but they do not seem to mean more than that once used hypo should not be employed. Of course, one knows all about the evil results of using worn-out or weak hypo, the insoluble salt that is formed, &c. It is the keeping properties of the clean unused solution that I am asking about. (2) Will a solution of sodium sulphite keep good? The Ilford P. O. P. instructions say that it will only keep for a day. The instructions issued by Lumière for an amidol developer for his plates, say, however, that one should make up 'a solution of sodium sulphite (which will keep for any length of time).' Other makers' instructions imply the same thing. Does it depend on the strength? Sodium sulphite crystals exposed to the air are said to take up oxygen, and become sulphate, but the action does not seem to be very rapid."—In reply: (1) We prefer to use the hypo solution freshly made. There is no objection, however, to its being kept for a few days, if it be unused. It is not advisable to keep it longer, as it is liable to decompose. (2) A strong solution of the sulphite will keep for some time, if the bottle be well corked. Though in this case we prefer to use it within a short time of its solution.

ENLARGING.—"GUILDFORD" writes: "Will you kindly answer the following questions in your Answers to Correspondents? I am proposing to get a good enlarging lantern (probably Ross') for producing 12 by 10 enlargements. (1) Is it correct, as I have seen it stated, that a more perfect result will be obtained by enlarging from ¼-plate to 12 by 10, than by enlarging from ½-plate to 12 by 10? (2) Shall I get as good a result, when enlarging from ¼-plate, in a lantern with a 6½ or 7 inch condenser, as I should with one with a 5½-inch condenser? I ask this as it might be convenient occasionally to enlarge from a larger negative than ¼-plate, but I do not wish to risk getting the best result for an occasional convenience. (3) About what average exposure would be required for bromide paper, using Ross' 9-inch rapid symmetrical—it works at *f*-8—using the oil light as arranged in their lantern. (4) Do you think I should get really good results (practically as good as by daylight) by keeping down the size to 12 by 10, without any appreciable falling off in definition?"—In reply: (1) All things being equal, No. Indeed, if the negatives be very granular the granularity in the smaller negatives will be the more conspicuous in the enlargement, by reason of the greater magnification. (2) Yes, but the exposure would be a little longer, because the light is distributed over a larger area. (3) Impossible to say, as all depends upon the power of the light, the sensitiveness of the paper, and the density of the negative. One or two trials will enlighten you on this point. (4) Yes, if the light is rightly arranged and centred.

VARIOUS QUERIES.—"STUDIO" writes: "(1) Would you please let me know where we could get figured tapestry and cretonne for studio accessories? (2) Is there any advantage in using acid hypo for plates and papers? (3) Would a half-plate lens do for a lantern lens? (4) Where could we get distemper for painting figured background? (5) Could you give a developer that would give a greenish negative? (6) Give a rich warm brown toning bath for P. O. P., for one dozen half-plate prints? (7) Please say a professional way to store negatives so that one could be looked up easily at any time? (8) Do you know of a French printing-out paper that takes on a high gloss? (9) How long will distilled water keep good for use?"—In reply: (1) They may be had from any first-class upholsterer. (2) None except that the solution keeps colourless for a longer time. Acid baths, for paper pictures, are not to be recommended. (3) Yes, but the lantern must be a longer distance from the screen. (4) So far as we are aware it is not an article of commerce, but any oilman or painter would prepare it for you. (5) If the plates have a tendency to "green fog," the pyro-ammonia developer would help it. (6) Any of the formulæ supplied with the paper will give a warm brown, such as the sulpho-cyanide bath. (7) There are so many ways. A good one is to put the negatives each in an envelope, and number it. Then stack them on shelves in the hundreds. (8) We do not know much of French printing-out papers, but Lumière will probably supply what you require. (9) Indefinitely, if it is pure, and fairly protected from the air.

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EX CATHEDRÂ.

...gnalium. Particulars of the working characteristics, and the variations of properties according ...omposition of this alloy have been published, and in ...y of the fact that photographic objectives have already ...n made with its aid, it will be well to make a note of ...m. Magnalium is an alloy of aluminium and magne...m, and according to the proportion of the latter metal ...oduced do its properties vary. Thus, ten per cent. gives ...etal more like rolled zinc, but if one half more than this ...the magnesium is present the result is more like cast ...ss: while if double or more of that proportion be added ...re is obtained a metal more like hard drawn brass. ...hler tried to make a similar alloy but unsuccessfully, ... the reason is now apparent; Dr. Mach has found that ...here is present in the aluminium, from which the alloy ...nade, any sodium, carbon, or nitrogen, the mixture will ...f no value. For sheets or tubes the proportion of mag...ium should fall below ten per cent., but for castings ...re than ten per cent. should be added. According to Herr Kaempfer, magnalium will turn well, and it can be drilled or milled readily. It is like soft brass under files, and permits of the use of the very finest of them without clogging. It takes a high permanent polish of a silver-white colour, and can easily be blackened. It is harder than aluminium, and when broken, the fracture more resembles steel than cast zinc, as does aluminium. Its specific gravity is about 2.5, and it bears a tensile strain about three or four times that of the latter metal. Finally, it is stated that it can be soldered satisfactorily, which point is of the highest importance, the difficulty of soldering aluminium being one of its greatest drawbacks.

* * *

The New Comet. There are many conflicting statements about the new comet, one observer having gone so far as to state that he has seen it already; but the consensus of scientific opinion is to the effect that it will be in the sky in the northern hemisphere so long after sunrise, that it will not be visible. This is unfortunate, for a good-sized comet with a tail of a few degrees only in length forms a notable addition to a set of photographs taken with an ordinary lens and camera, as many will know who remember the last great comet, which first made its appearance in the southern sky, and was so splendidly photographed by Mr. Gill at the Cape.

* * *

Rontgen Ray Photography. Great strides of late have been made in working with the X rays. What with improvements in the make and power of adjustment of coils, and in the construction of the osmium tubes, results of a most astonishing nature are now produced. The time of exposure has been reduced from minutes to seconds, and a power of discrimination of the texture of the various structures of the body has been reached that was never dreamed of in the early stages of Rôntgen-ray work. One of the most attractive of exhibits at the recent Royal Society's Conversazione was a set of stereoscopic skiagraphs which gave an effect of roundness and solidity entirely different from the usual, often somewhat confusing pictures taken

with a single radiant point. Perhaps the most recent contribution to the science has been by Mr. Wimshurst, who uses a modification of his well-known influence machines, the original type having been discontinued by him for a long time past. His present machine has twelve plates of 39 inches, while formerly he employed glasses of the enormous diameter of 84 inches. He finds that by using an instrument made up of many small metal tubes, practically no photographic light is emitted from any other part of the X-ray tube than that which starts from the centre of the anode whence radiation visible and invisible takes place in every direction throughout the illuminated hemisphere of the tube. He finds further that the whole of the apartment is filled by rays of some sort that are capable of penetration, photographs having been taken by them even through red paper and a thick coating of lead on the box containing the plates. Further, quite in opposition to the old ideas, he states that rays are easily and freely reflected from a mirror, and that skiagraphs may be taken, though with less efficiency, by rays which flow off at a right angle to the principal beam of the anode. Photographs illustrating all these phenomena were shown at the conversazione referred to.

* * *

The Lumiere Company. Last year on the occasion of our visit to the Paris Exposition, we inspected, with feelings of astonishment, a model plan of what, so far as our knowledge and experience goes, must be regarded as the largest and most completely equipped dry-plate works in the world. We allude to the establishment of Messrs. Lumière, at Lyons. English photographers would best form a conception of the vast business done by this eminent firm by mentally picturing to themselves a dry plate concern of equal magnitude to that of the well-known firm of Messrs. Lever Brothers, at Port Sunlight, Cheshire. The result of this enterprise is shortly to be made known in this country. Messrs. Lumière have deservedly secured a world-wide reputation, not only as manufacturers of plates, films, and papers, but as chemists in the theoretical aspects of photography. Our readers for years past have been familiar with their names in both capacities, and it must come as no surprise to them to learn that the Lumière plates and papers are about to be introduced to the English market. The managing director of the English branch of the company is, we understand, Mr. E. Llewellin White, of the Photochrom Company, in whose judgment, experience, and knowledge of the photographic trade every confidence may be placed. We hope to have an early opportunity of subjecting the Lumière plates to practical test in the camera; in the meanwhile, we learn that Mr. White is about to proceed to America on business connected with the Lumière Company, and we bespeak from the whole of our readers there the utmost consideration and courtesy for him at their hands.

* * *

The Polish of Glass Surfaces. Lord Rayleigh in discoursing on "Polish" at the Royal Institution, after remarking that he was not going to give—as the title given to his subject might suggest—an essay on manners, gave a very interesting description of the polished surface of glass. This subject has appealed in a double direction to photographers; first, as to the state of the surface a lens, and all those conversant with optical instrumen are aware that there is a vast difference amongst the lens of various makers in regard to the state of the surface—i intense brilliance or otherwise. Secondly, it was alwa found in the wet-plate days that some glass more readi gave markings than others—patent-plate, so much admir because of its flat surface, being very prone to this defe The veteran photographer, Mr. Alexander Forrest, intr duced a patent-plate substitute to avoid this defect, h theory being that, in the natural unpolished state, t glass had a species of hard skin that, in the process of ma ing patent-plate, got rubbed away, leaving a softer a comparatively porous surface behind. His views were a manner confirmed by Lord Rayleigh, who stated that gla however finely "ground" with fine emery, had have a final polish given by a special application of roug He took it that polishing was not continuous with grin ing: it was a freer grinding, but of a different characte He showed on a screen a finely ground plate covered, not might be expected with scratches, but with a number minute pits. The object of polishing was to remove these pi but it was shown that many of them remained even plates showing relatively high polish. For many optic purposes these pits were no detriment. He pointed o that while gaseous hydrofluoric acid roughened the surfac the liquid acid dissolved the glass, but left a highly polish surface, and that by the use of this acid very fine adjus ments of surface could be effected, a fact which he thoug had perhaps not been sufficiently utilised in practice.

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Weather Forecasts. The Meteorological Council has recent announced that it will, during the harve season, supply forecasts of the weather by telegraph to pe sons desirous of receiving them upon payment of the cost the telegrams. The special harvest forecasts will be pr pared at 3.30 p.m., and be applicable to the twenty-four hou from midnight following the time of issue. Applications f the forecasts may be made to the secretary, Meteorologic Office, on forms that will be supplied. If we are not m taken the Meteorological Council have done the same thi before, and the practice was discontinued on account the work not being appreciated, or the forecasts not bei found sufficiently reliable to be of service to farmers. Mo of us know how totally unreliable are the forecasts, issu by the Metereological Office, that appear in the dai papers. Were they more trustworthy they would oft prove of great value to photographers. The Council sa that in view of the importance of checking the accuracy these harvest forecasts they will be glad to supply to tho recipients who will signify their willingness to co-operate the matter, forms on which records of the weather expe enced may be entered for enabling the Council to compa the forecasts with the subsequent weather. If this be ca ried out, and the returns published, it will be interestin as showing how far the forecasts have been accurately mad At present the forecasts issued by the Meteorological Offi are generally received, by those who make a practice reading them, with a certain amount of scepticism. would also be interesting if farmers, who are, as a rule, tole ably good weather prophets, would make a forecast on the own judgment before they received that from the Office a

ure with the weather subsequently experienced. They then prove the value or otherwise of the official fore-
A return of these, if published, would also be of st.

* * *

lew ge Stamps. Rumours have been current in art circles for some time past that the design e new postage stamps, of course with a portrait of the was the work of a foreign artist, but little was, ritatively, made known. All doubt on the point is now ide, for a query was put in the House of Commons on day, last week, by Mr. E. J. Griffiths, as to whether esigns for the new postage stamps had been entrusted Austrian sculptor; and, if so, whether this was due to ct that there was no British artist competent for the Mr. A. Chamberlain, as representing the Postmaster al, replied that it is the case that the portrait of His ty which had been used in the preparation of the de- for the new postage stamp, is by a foreign artist, there in existence an excellent profile portrait executed ast year by the Austrian sculptor, M. Fuchs; adding it is not to be inferred that no British artist is con- d competent for the work. Arising out of this reply pertinent questions were put, one of which was by Balcarres, as to what form of inquiry or competition olace by which the unsuitability of British artists was nined. Another was as to whether the opinion of resident of the Royal Academy, or other leader of the ic profession, was taken in the matter? In reply to uestions Mr. Chamberlain said that if any further in- tion was required notice should be given. No doubt natter will not be allowed to rest without further ions being put. Feeling is very strong on the subject me quarters, and it seems to cast a slur on British s that the design for the stamp of Great Britain should e work of a foreigner, and not a Britisher. It would t appear that the patriotism of the people of the d Kingdom has been ignored in this matter, and it is herefore, a matter for surprise that considerable feel- as been expressed amongst English artists.

PRACTICAL HINTS ON ENLARGING FOR AMATEURS.

OWING up our article of last week on a cognate sub- it is permissible to remark that what be- s of the large number of plates and films that laily exposed in the thousands of hand cameras now e is quite a matter of speculation. Some of the nega- at times, get enlarged, for the enthusiastic worker is n content with a quarter-plate print if the subject be tistic one, or one of more than passing interest. Now, st be confessed that the majority of enlargements that nateur makes are on bromide paper, and we—most of now, unless the worker is more experienced than the rity of amateurs are, that the results are often by no s satisfactory as pictures. The exposure may be faulty, olour unpleasing, the picture under or over developed, o say nothing of the difficulty that the novice encount- rith bromide paper, in producing three or four enlarge- s of one uniform depth and colour from the same nega- tive. Of course, this means waste of material and time, disappointment, and sometimes loss of temper. If the work is put out to be done by a professional enlarger then the picture cannot be claimed as the sole work of the owner, if the picture is sent to an exhibition.

It is a little surprising that amateurs, instead of making their enlargements direct on bromide paper, do not more largely produce enlarged negatives, because from them they may obtain prints by any process—platinum, carbon, or any other—with the assurance that they will all be of uniform quality. Furthermore, with an enlarged negative, one has ample scope for retouching, or "faking," to any extent both on the negative itself and on the transparency from which it was made. By this system of working, it is easy to obtain, in many cases, enlarged negatives that are infinitely superior to the originals from which they were made, even when they were tolerably good. This, of course, cannot be done when the enlargement is made direct from the original on bromide paper. Many amateurs seem to be deterred from this system of procedure on account of the extra trouble involved, but that, after all, is more imaginary than real. It is quite as easy to develop a transparency as a negative, and a large negative as a small one, and the same enlarging appliances, whether for day, or artificial, light that serve for bromide paper will answer equally as well for the work.

In the first place, a transparency must be produced. This may be done either by contact or by camera printing. But the way we prefer, and that is what we now call special attention to, is to make the enlargement, the full size required, direct as a transparency, then the negative can be made by contact printing from that. The advantage of this method of working is very great, for we secure all the sharpness of the original in the enlarged transparency in the same way as we do in the case of bromide paper enlarging, and thus avoid the magnification of any defects that may be present in a small transparency. Also, when the large transparency is obtained it may be easily retouched or "faked" to any extent, as the lights and shades are as in nature, and not reversed as they are in the negative, so that the effect of the work can be realised as it proceeds, a great advantage to the novice. In working up the transparency the work should be, mostly, confined to the shadows of the picture, which may be strengthened to any degree that may be required; while the light should be, correspondingly, dealt with in the negative. Much of this work, it may be mentioned, may be done roughly on the back of the plates in each case without fear of its showing in the finished result. Whereas, if that were done, however finely, on a small transparency the work would be very manifest in the enlargement. Furthermore, the enlarged transparency can, after it has been utilised for producing the negative, be used as a window decoration.

An objection may be raised against this method of working on the score of the cost of large dry plates, and it must be admitted that large dry plates are more costly than small ones, but as most of the makers now put up plates, larger than the whole-plate size, in half-dozens, and those of the still larger sizes in quarter dozens, this becomes a not very material item after all.

Here is a practical hint or two as to the making of the transparency. It should be very fully exposed so as to secure full details in the lights, in fact there should be no

absolutely clear glass anywhere. It should also be made tolerably vigorous in the development as then a vigorous negative can be obtained from it without any difficulty. If the original negative should err on the side of flatness, then the development of the transparency should be conducted so as to secure enhanced contrasts; the same thing being followed in the development of the negative. If the small negatives were of the opposite character—hard and crude—then the transparency, and the negative, should be developed with the view to securing softness. In this way any one, with only moderate skill, will be able to obtain vigorous enlargements from flat originals, and harmonious ones from negatives that, if printed from direct, would only yield hard prints, or, if enlarged on bromide paper give "soot and whitewash" results.

The plates best adapted for making the enlarged transparency, and the negatives, are ordinary slow ones. Fast plates should be avoided for the purpose by the amateur for this work. In some cases when the original is exceptionally flat and lacking in contrast the plates specially made for photo-mechanical work would be advantageous, though, as a rule, ordinary slow ones will suffice, in practice, for all classes of negatives. Having secured a suitable transparency the negative is best made by contact printing and developing in the ordinary way. Or, if the grain of the paper is not considered objectionable, it may be made on paper. In this case the paper must be very deeply printed and it should not be toned, but simply fixed, the colour of the image is then of a very non-actinic character. The negative having been secured we now have the means of making prints from it by any process we may choose.

Here is another hint. If the carbon process is selected for the prints it will save trouble to make a carbon negative from the transparency by deeply printing a piece of transparency tissue, and then developing it on a glass plate. In this way we get a reversed negative that can be used for the single transfer method and thus obviate the trouble of double transfer, so often a bugbear to the amateur. The plan we are now suggesting is a very old one and has been dealt with more than once before, but its advantages do not seem to be so fully realised as they deserve to be. It may be incidentally mentioned, in conclusion, that it is an open secret that the very fine carbon enlargements of some of the animals in the Zoological Gardens, published some years ago by Messrs. Dixon and Son, were produced by the method just referred to, and they have yet to be surpassed.

FESTINA LENTE.

We have got so used to considering the time in which we live as a period of hurry and rush, that we give little thought to the real meaning of this characteristic, and its desirability or otherwise. If anything, we rather admire and boast of the rapidity with which everything is done, as compared with the manner in which our benighted forefathers pursued the very even tenor of their way. Everything, however, brings its own reaction at last; perhaps presently things will be the other way round; already there are distinct signs of a growing restiveness at this spirit of hurry, and a lurking desire, concealed as much as possible for very shame, to take things easily, and cultivate the habit of *laisser faire*. At present, though, it is only a few, wise in their generation, who venture to actively pro against the present feverish love of doing things too quic

In photography, especially, all haste and impatience h a most pernicious effect; and yet among pnotographers be found the apostles and devotees of the doctrine of hu The one who can turn out the most work in the shor time seems to be regarded as the ideal expert, the gl fied type of the practical man who knows his busin Deliberation, carefulness, anxious thought and contriva that all the requirements of first-rate technique are ined, are looked on so often with suspicion and distrust savouring of the amateur, or that inexperienced nervous born of lack of confidence. Yet how different should the mental attitude taken with regard to so essentially tistic a profession. The really successful men among us after all, those who scorn to introduce any large amoun latter-day commercialism into their work. A little stor being told, just now, which aptly presents in a conc form the light in which a truly masterful mind regards hurrying fraternity. The scene is laid at the R. P. S. ro in Russell-square; the dramatis personæ are a well-kn high-art photographer, who carries on his highly succes business not a hundred miles from Bond-street, and on those up-to-date young fellows who seem to think the w was created for their especial benefit. Says the latter, v a self-satisfied air. "Oh, Mr. So-and-So, I developed hundred lantern slides in an hour, yesterday. What do think of that for a record?" To whom, slowly and sa replies the other, "Shut yourself in your dark room, friend, and repent, before it is too late!" These la were the words of one who knew what he was talking ab to whose eyes all the folly, tragedy, and failure of wh reckless haste is the parent were visible in their true hateful colours.

The startling loss of artistic perception that follows the adoption of a hurrying spirit is almost incredible. stances have been known of expert operators, the produ of portraits really pleasing in every sense, who have gra ally lost their skill and totally degenerated. Why? Sim because they have allowed themselves to be carried away the all-prevailing rush, and had deteriorated into mere posing machines. Of course they made their hay w the sun shone, only they made it so quickly that soon t was no more left to make, for the public that they worshipped in place of their art soon left them, to workers of finer fibre and sensitiveness.

It may be safely accepted as a fact there is no get round, that it takes a certain minimum time to do a th properly, and that if it is done in less it is sure to be fa to a greater or smaller extent. Time is rarely saved hurrying. The negatives that are hastily developed want more retouching, the prints too quickly rushed thro require more spotting, besides being in every other res inferior. We remember, some time ago, seeing an ad tisement for a printer, "one who is able to see dust on negative." Evidently that employer had had some exp ence of the man who hurries and was not desirous to peat it.

It is doubtless among the producers of cheap work the greatest amount of hurrying will be found, as one w naturally expect. Where prices have been cut down to lowest possible point, time is, of course, not to be lig regarded, and all operations must be carried out at

ed. When, as in this case, there is a strict commercial essity for hurrying, one is less inclined to speak harshly t, however little may be our sympathy for the conditions t create it. Cheap work, nevertheless, need not be bad. ere are ways and means of making the most of time and ducing photographs rapidly in numbers, while yet tak- all due care over their production. Unfortunately, the rage photographer for the masses either does not know , or does not care. Certainly, the cheaper portraits pro- ed in this country are far inferior to work of the same s as seen in the Colonies and America, in artistic quality, unting and finish. Perhaps an example might be en of methodical haste as contrasted with its antithesis. us imagine that a large amount of plates have to be eloped. The man who hurries and cares not what he s will probably develop them one at a time, taking no uble to dust them, or to rinse out the dish after each te, paying no particular attention to washing after de- opment and before fixing, and committing numerous er offences against the canons of perfection, his only ught being to get the work done in a given time. The ult is a number of horribly spotty and faulty negatives, ich, perhaps, give more trouble to patch up and render ently fit for printing than would have sufficed to carefully velop double the number. A pleasing contrast to this gh and tumble procedure is shown by the really practical n, who, though compelled to do his work in the mini- m of time, will yet see that it is well done. He will, most ely, develop, say, a dozen plates at once, in a large dish, th a not too rapid developer, thus gaining ample leisure pay due attention to all those little items which, added gether, make the perfect negative. Numerous other ne-saving devices will readily suggest themselves as a of that there is really no excuse for the objectionable riety of hurry, so well known in those unfortunate studios ere employer and employed drive themselves and each her to distraction and premature collapse in the vain deavour to make two plus two equal five.

It is not only the professional who hurries; the amateur by no means guiltless in this respect. It is often quite musing to watch the frantic haste with which some of em conduct their operations, only too pleased if they have me one to witness what they apparently consider evi- nce of their expertness and practicality. One would ink them under the impression, seeing the way they go work, that a day consisted of only six hours, and a week but two days. One result, at least, of the universal irit of hurry is in a sense beneficial. We allude to the eat simplification of many photographic manipulations, d the gradual elimination of unnecessary time-wasting ethods of working. The extent to which portable and ady-made developers and reagents have been introduced also gratifying in its way. Good, it seems, always comes t of evil, as by the inevitable decree of an immutable w.

We will say little or nothing of the disastrous effects of ndue hurry and rush on the human constitution. After ll, if a man likes to ruin his health and shatter his nerves, is his affair and nobody else's. Perhaps he may be sorry, hen it is too late, and wish he had paid more attention the ordinary common-sense rules that regulate the phy- cal well-being of mankind. Perhaps it is rather hard that is capacity for usefulness and ability to make the best of his life, for himself and others, should be thoughtlessly bartered for so little reward as such attempts to steal a march on time commonly bring. Alas, how many valuable workers might be still among us, if they had not tried to do two years' work in one! Some missing faces, at least, are not yet forgotten, whose bright, wayward, meteor-like existence left its ineffaceable mark on all who knew them.

A genius is said to be one who possesses the faculty of taking infinite pains, which is, perhaps, another name for a man who is never hurried. We cannot all make any pretensions to genius, but we can do our work calmly and well, as quickly, too, as is consistent with the fulfilment of the latter qualification, avoiding mere hurry and rush as we would the pestilence; remembering always that we can but live and labour once, that so we may make the best of our lives and their duties ere the night cometh, when no man can work.

THE SALE OF POISONS.

(By an Ex-Chemist.)

An experience of twenty years as a chemist, during fifteen of which he was in business for himself, may, on the face of it at least, be reasonably regarded as giving the writer some little extra right to discuss the sale of poisons. The fact of there being no particular axe to grind, in that the business has been recently given up, should also, presumably, add to the right. Further, he has no grudge whatever against his old trade, nor its governing body, the Pharmaceutical Society. Both did well by him.

There is no doubt that the public needs guarding against itself in the matter of poisons. Not so much from the would-be suicide point of view, as that of ignorance and carelessness. Those who think so little of life as to wish to abruptly leave it, are very few and far between. Life, spite of its occasional dash of bitters, is too sweet upon the whole to be lightly given up. If it should be otherwise, and death's gateway of poison have been chosen as the one to pass through, it can be unlocked easily enough, spite of any St. Peter function of key guardian given to the chemist. But the subject is rather gruesome, and no good could be got by discussing it more fully, even though it figured in larger proportion in connexion with the sale of poisons.

Most people have a healthy distrust of poisons. They are suspicious of them even in the minute doses in which they act beneficially as medicines. That is, if they know of their presence in their pills and mixtures. The Latinity of the doctor's prescription, and the chemist's drawer and bottle labels, is an effort to keep this knowledge from the patient. A wise one, if the sufferer be, as he generally is, a bit nervous. Sceptics will, of course, add—and a profitable one to the chemist whether his customer be nervous or not. It is no use discussing this matter either, there would never be any agreement upon it. As star differeth from star in magnitude, so does one chemist from another in standard of virtue. It can, however, be pretty safely assumed that the majority of chemists are very much like an equal number of their fellow-men outside of pharmaceutical ranks. They would, at least, act up to the average commercial standard of honesty in dealing with their customers. A reasonable man would not expect more.

To return to the more immediate point, the sale of poisons, leaving the one with a saving dread of poisons as not very likely to take much harm, another type of man is certain to turn up sooner or later. A worthy and amiable individual enough in many other directions, he has a very airy, free and easy, way of regarding poisons. He is not quite certain whether it was oxalic, or tartaric, acid that his wife told him to ask for, but knows that it is for making ginger beer. He has heard that "aqua fortis" is a good thing for soft corns, and "spirit of salts" for chilblains. He wants Tr. of aconite for a cold, and when asked if he knows the dose, evidently tones it down considerably, in deference to the grave tone of the questioner, to a small teaspoonful, a dose that would probably put a speedy end to his cold, and to himself at the same time. Against this man and his ignorance or carelessness it is wise to interpose some buffer or other. It is equally wise to compel some responsible person to plainly label as

"poison," in the danger colour of red, any poison that is introduced into the ordinary household. The chemist fulfils these functions, for the proper carrying out of which he qualifies by examination. It will be readily admitted, probably, that in return for such care, and the labour and money expended in qualifying to gain the necessary knowledge, he is entitled to extra remuneration. The grievance is that where care is unnecessary the extra charge is still made. To put the point in the concrete, and as applying to photographers, that a man of evident discretion should be compelled to leave a dealer of position and repute, from whom he elects to buy all else, and in the case of a poison he knows very well how to use, to go to a chemist's to get it, and pay more for it—this is certainly unfair, within these limits, and goes against the English notion of freedom. It should, however, be qualified by "within these limits," that is, the sale of a poison by a dealer of discretion, although unqualified, to one who may reasonably be regarded as knowing what he is buying, and how to use it. Otherwise it would certainly be safer and wiser to suffer from the minor evil than dangerously slacken the undoubtedly wise bonds of the Poisons Act. That this would not happen if any change were made rests with the Association promoting it to prove. The conditions under which its members would sell are certainly different to those applying in the case of a chemist. The demand would not be so general and haphazard. The number and kinds of poisons kept by each individual trader would be few, special, and sold to grown-up people of superior intelligence. Further, there would never be any question as to whether what they sold was to be taken or not, as in the case of many articles, laudanum, belladonna, and so on, when asked for in a chemist's shop. These considerations would materially reduce risks. In addition, the seller would be a man approved of as careful by a chief constable or a magistrate. The only drawback is lack of full scientific knowledge and a diploma gained in an examination. Now, where there may be need for special technical knowledge, lay approval only would not be of much value. Where such need does not exist, an individual so approved would not only be a good man, but more likely to be even a better man, than one who claimed high consideration, merely from having passed a technical examination. Outside of special knowledge, the chemist falls short of his fellow-tradesman in all-round common-sense capacity for dealing to best advantage with men and things. It is the natural result of his training. His hours are inordinately long, and spent, as a rule, in a small, ill-ventilated, musty-smelling shop. His business is so eminently a personal one that he cannot delegate its care to assistants, like the draper, grocer, and ironmonger. He must himself be on the spot, and consequently has not the opportunities of broadening contact with his fellow-men. The tales he has to listen to are mostly those of petty woes, and long faces are the ones he looks at. In addition, the amount of the professional in his work is not enough to give him breadth, but more than enough to make him quackish. He unconsciously gets to consider himself rather a superior kind of person. The writer did anyway—carries it about him still, as far as that goes. He may have been vainer than his fellow-chemists; but, looking around over the many he has known, he cannot think so. He holds himself to be amongst the averages. All this must handicap the chemist as an all-round guardian, compared with a man who is subject to wider, more generous, and healthier influences. If he knows more of the composition of a poison, and its dangers, he is not from that the best judge of whom to sell it to. Indeed, he is not so good a judge as a man who, although short of the technical knowledge, has had more liberal and general experience, and simply knows it as a poison. The sale within the limits recognised by the Trades Association for selling specific poisons, and with the precautions they are willing to take, is as safe every bit, if not safer, than in the hands of the chemist. Certain risks there are, and always will be, in selling poisons, but they are present in the chemist's shop as well. It is not contended for a moment that a chemist does not need special qualification and knowledge to carry on certain portions of his business, dispensing prescriptions, for instance. But no competition is intended in these. Not that the ordinary provincial chemist gets overmuch dispensing nowadays, as a rule. The struggle is so keen that the doctor frequently dispenses, and so gains the extra profit on the medicine, as well as that on each visit from the patient, which, had a prescription been given, would have been paid to the chemist. The chemist in turn, having his own bread and cheese to earn, goes in as much as possible for the doctor's side of prescribing. Probably doctor's opinion were asked in this sale of poisons matter, he w commit himself by saying that there was far less danger to the p in the photographer's selling poisons than in the chemist's prescri The higher medical specialist in turn would say that there is more danger in the "ordinary practitioner's" meddling with cas knows so little about. It is a matter of wheels within wi Theoretically, each man ought to be doing exactly what he has trained to do. In practice, a kind of convenient workable co mise has to be struck, and saving common sense looked to to c it. Upon this result of experience in general, there is no reason a dealer in photographic materials should have certain poisons s out from amongst them. Had photography been the power it is when the Poisons Act was passed, most probably, with such guards and limitations as those mentioned, dealers in photogr poisons would have been exempt under it.

OXFORD.

[Reprinted from the "Handbook to the Photographic Convention of the United Kingdom."]

THERE must be many places which have been visited by the Co tion in former years about which the intending cicerone fou necessary to rack his brains and ponder deeply over the annals o past before he could rake up sufficient material from which to struct an interesting series of subjects for the cameras of the vis to be exercised upon during the eventful week. But this, at leas not my fate. For whatever may be said for or against this Unive as a permanent place of residence, there can be no question tha the temporary visitor who comes provided with a camera, and knowledge how to use it rightly, Oxford is a veritable storehous delights, and in welcoming our visitors this year we are quite scious of the fact that we are introducing them to a region w they will find a feast of good things, to attain which they need travel for long distances by land or water, but during their sojour the "ancient seat of learning" they will find them almost at their doors.

Under these circumstances the difficulty with which I have to tend is not so much to procure sufficient material with whic construct my "guide," as to decide what can possibly be left out, if I were to write all that there was to be said it would fill the w book, not once only, but many times over. The Colleges are, I pose, the chief characteristic of the place, and I propose to enum briefly the points most worthy of mention in each of them. A wards we will proceed to consider other architectural feature the city, and the various groups of buildings in the town which favourable subjects for the camera.

If it be true, in Italy or elsewhere, that "all roads lead to Ro it is certainly equally true in Oxford that all roads lead sooner or to Carfax. This is the centre of the town, from which the main st branch off, and as the Town Hall (our headquarters) is close at h I propose to make it our starting point.

The nearest College to the visitor who takes up his stand at Ca is also the largest in the University. This is Christ Church, or, is popularly designated by the undergraduates themselves, House." Christ Church possesses the following leading features :-

The Great Gate, popularly called "Tom Tower," on account of bell within it called "Great Tom." This is one of the largest bel the world, being 7 ft. 1 in. in diameter, weighs over 7 tons, is a 400 years old, and every night at 9.5 it tolls 101 strokes, that ha been the original number of students upon the foundation of the Ho The bell itself is hardly a possible subject for the camera, but f the louvres of the tower a good panoramic view could be got of the t below. The tower itself was designed by Sir Christopher Wren, the bell was removed to Christ Church from Oseney Abbey, and placed in the tower in May, 1684. The Great Gate is best photogra from the road opposite, from in front of the gate of Pembroke Colle it wants the afternoon light. Inside the gate there are various vi to be got of the great quadrangle, the archway dividing the two q rangles, with a statue of the late Dean Liddell surmounting it and inner quadrangle known as Peckwater Quad. This latter wants afternoon light, as does also the east gate. The Chapel of Christ Ch is the cathedral of the diocese, and the interior is worth many pla the principal features being the nave and east end of Chancel, the L Chapel, and the old Baptistery. The Latin Chapel has on its r side the tomb of St. Frideswide—Patron Saint of Oxford—which splendid structure with a watching chamber above it, and well wi two or three plates. Other antiquities must be left for the visito discover on the spot. There is a good view of the Cathedral to &c., to be had from the small quadrangle on the way through cloisters, but it requires a lens of very wide angle. The best vi

ever, of the outside of the Cathedral is to be got from the windows
ie College Library, the front of which is in Peckwater Quad, and
es a good subject early in the day; some may also like to try
luck in photographing the interior. The staircase leading up to
Hall, with its grandly carved roof, makes a splendid but very
ult subject. The Hall is the largest in the University, and contains
y portraits of worthy sons of the College. Continuing through the
ters we emerge on the "Broad Walk," an ancient avenue of
old trees which is worthy of a plate. At each end of the Walk are
ues leading to the river, but that at the east end is a riverside
throughout its length, and contains many charming bits of river
ery. The College barges at the end of it are best photographed
the other side of the river Isis.

Pembroke College, opposite Christ Church gate, the chief fea-
s are the inner quadrangle, including the Hall, and the interior of
Chapel. The view with the exterior of the Hall wants the morn-
light, and that with the exterior of the Chapel the afternoon light.
re is here a wonderful old library which, among other antiques,
ains the original desk belonging to Dr. Johnson, who was at the
ege in 1728, and had rooms on the second floor, over the gateway.
ntering Christ Church again, and leaving by the gate in Peckwater
d, we have on the right Corpus Christi and Merton Colleges, and
he left Oriel College. The last-named has a curiously-built quad-
gle, but the actual buildings are not very old, dating from 1620.
ht through the outer and inner quadrangles is a third quadrangle,
, the old quadrangle of St. Mary's Hall, which is more worthy of a
e than either of the others. The Hall is interesting internally, hav-
a fine wooden roof with a "lantern" in its centre.

bout Corpus Christi College there does not seem much to say.
sun-dial in the centre of the quadrangle is of a cylindrical shape.
as constructed by Turnbull, and erected in 1605.

ext to it, on the same side of the street, is Merton College, one of
oldest in the University, founded in 1264, and said to be the original
lel upon which all Collegiate bodies in Oxford or Cambridge were
structed. The College Chapel was also, till 1891, the Parish Church
he district, and has a beautiful interior. It has also a massive
er, which makes a good picture from "Merton Grove" just be-
th it. The Chapel is dedicated to St. John the Baptist, and was
nerly known as the Church of St. John-within-the-Walls. The
ls were just outside it, and their site may be traced in the terrace
ks forming the present College gardens. The quadrangle of the
lege is quaint in construction, and the library is the oldest but one
the University (some say in England), dating from 1349. It is
cially rich in valuable manuscripts and ancient volumes. Both these
ldings are worthy of exposures for those who are adepts at interior
k.

Continuing down Merton-street the visitor will emerge in High-street,
r the site of the old East Gate of the city. A few yards to the right
ng us to Magdalen College and Bridge. Plenty of subjects for the
nera will be found within the quadrangles of Magdalen. The prin-
al features are the Inner Quadrangle with its quaint gargoyles, which
l take several plates, the Founder's Tower and the Chapel, which
sesses a splendid reredos. The College was founded in 1458, and
s erected on the site of the old hospital of St. John the Baptist, of
ich portions are still discernible in the older portions of the build-
s. The hospital was erected as a place of rest for pilgrims coming
Oxford to visit the shrine of St. Frideswide. The view of the inner
drangle with the Founder's Tower wants the early morning light,
l photographs taken in the middle of the day, if bright, will pro-
ly be failures. The old pulpit from which the sermon used to be
ached on St. John the Baptist's day, when the quadrangle was de-
ated with rushes to represent the wilderness, is worth a plate.
rough the College, out in the walks, will be found many pictures—
long walk on the left of the meadow is known as Addison's Walk,
ving been the favourite haunt of the poet. The Tower of Magdalen
llege (the tallest in the city, being 145 feet high) and the oldest part
the College beneath it, makes a good group for those who can
mount the difficulties of the traffic, from the end of Magdalen
idge, a short distance from the newly-erected drinking fountain. By
onians the name of this College is almost invariably pronounced
Maudlen" (the same rule applying also to Magdalen College, Cam-
dge), for which visitors must be prepared.

Returning to High-street—on the right is Queen's College and on
left University College. Neither is worthy of special mention
m a photographic point of view, but the buildings of Queen's are
y unique in appearance, and University claims to be the oldest
ndation in the place. The exterior requires the early morning
ht, and the afternoon light is best for the quadrangle; Queen's wants
afternoon light.

The other Colleges are more or less separated, and the visitor must
ke his way to them as best he can. Chief among them in point of
riety of subjects is—

New College.—As this is one of the oldest foundations in the Uni-
rsity (dating from 1380), its name (though possibly appropriate at
st) is now somewhat lacking in accuracy. The inner and outer Quad-
ngles, Chapel, Hall and Gardens are all worthy of many plates,
d the ancient Cloisters are the finest things of their kind to be found anywhere in Oxford. The Cloisters with the Bell Tower included form an absolutely unique subject, but one very difficult to take satisfactorily. The College Gardens contain as boundary the ancient walls of the city, which are provided with various outlets from which to shoot upon the advancing foe. The view of the College from the gardens wants the morning light, and the quadrangle (opposite the gateway) the afternoon light.

Space being a consideration, the remaining Colleges must be passed over with shorter notes.

All Souls', High-street.—Splendid Chapel, magnificent Reredos, quite the most beautiful in the University. Best light from about 11 a.m. to 4 p.m. Inner quadrangle wants rather late morning light.

Balliol.—Front buildings more modern than most of the others. Front from Broad-street wants afternoon light; inner quadrangle wants rather late morning light. The Hall makes a good picture.

Brazenose.—Front and door with the "Brazen Nose" knocker, wants the morning light (this is in Radcliffe-square); inner quadrangle, with ancient sun-dial, either in early morning or late afternoon; inner quadrangle with view of the "Camera Bodleiana" requires late afternoon light.

Worcester (opposite bottom of Beaumont-street).—Old buildings on the left side of entrance, want very early morning light from quadrangle, late afternoon light on the other side, from gardens. Walk by pond, some good views in the gardens.

Trinity (Broad-street).—Chapel, just opposite entrance, wants the afternoon or diffused morning light; it is also curious internally. The old building on right side of entrance (fronting Broad-street) is called "Kettel Hall," it wants the early morning light, inside the quadrangle. Here there is also an ancient lime tree walk, worth a plate, and the buildings of the College look well from the gardens.

Exeter, Lincoln, Wadham, Hertford, Keble, and Jesus.—These possess but few photographic points of interest. In Exeter Chapel is a splendid piece of tapestry depicting the Adoration of the Magi, by Burne Jones, but as the Chapel is very dark it is not an easy subject. It is, however, worth a plate, and another may be used on the Chapel itself. The buildings of Wadham make a good group from various points in the gardens; this wants the early morning light. Jesus may be interesting to any Welsh visitors as being the headquarters of the Welsh undergraduates in Oxford, while Keble possesses a magnificent Chapel, adorned with gorgeous paintings, well worthy of a plate or two.

St. John's (in St. Giles'-street) brings the Colleges to a close. Here there are two quadrangles, with ancient gateways surmounted by statues black with age, some fine gardens, from which the buildings look well photographed in the morning light, and a fine specimen of the average type of College Hall.

In the above remarks it must not be supposed that all the features of every College have been included, some not mentioned may appeal to some of our visitors more than others which have been inserted. In every College the Chapel and Hall should be inquired for, and in the majority of cases something of interest will be found in one or the other. Many also have fine libraries, but the want of space and the comparative darkness, or the contrasts in lighting, may prevent a really successful photograph being taken in many cases. Most of the Halls require a wide-angle lens to get their principal features into the plate. Those which are the most easy to manage, on account of their size, are the Halls of Christ Church, Magdalen, New College, and St. John's.

The subjects worthy of being photographed in the city, which are not actually portions of Collegiate buildings, are so numerous that the mere recital of them must suffice. The New Schools in High-street are grand subjects, both inside and out. Radcliffe-square possesses a number of buildings of interest archæologically and photographically, including the University Church of St. Mary, of which the porch is best taken from High-street in the morning light, and can best be got into the plate by going a little way down Oriel-street, almost opposite. In the centre of Radcliffe-square is the circular building known as the Camera Bodleiana, which constitutes the more modern portion of the literary treasures of the Bodleian Library (the entrance to which is in the corner of the Old Schools Quadrangle), the library being one of those which have the right of claiming a copy of every book published, under the Copyright Act. The Camera is open till ten o'clock p.m., whereas the Bodleian itself shuts at dusk. Round the upper portion of the Camera is a gallery 100 feet high and 170 yards round the building, from which a magnificent view can be obtained, and many photographs might be taken. The "Lantern" at the summit of the Sheldonian Theatre, though smaller in outlook, gives, perhaps, a still finer view—the vista of architectural beauties spread out before the beholder, backed by the villages around the city, and the hills of Shotover on the one side and Wytham on the other, is grand in the extreme.

The "Old Schools Quadrangle" referred to above, which is entered by a gate directly in front of the door of the Camera, across the road, contains a fine tower which is worth a plate. A better subject is the interior of the old Divinity School, close at hand, the roof of which is magnificent. Passing up Broad-street and turning round again, a splendid group of old buildings is formed by the exterior of the Sheldonian

Theatre and the Clarendon Buildings (formerly the University Press), with Exeter College on the extreme right, and the more modern Indian Institute in front. This is best taken in the afternoon. Another well-known group of buildings is formed by placing the camera opposite the Taylor-buildings (picture gallery, top of Beaumont-street, in St. Giles'), the "Martyrs' Memorial" being in front, with Balliol College on the left, St. Mary Magdalen's Church behind, and behind that the Church of St. Michael-at-the-North-Gate, which, as its name implies, is near the site of the old entrance to the city. The view up High-street, from a little lower down than Queen's College, and including it, is a grand sweep of buildings. An eminent artist is said to have declared that the street "has not its equal in the whole world," which certainly does not err on the side of "faint praise." The view down the street wants the afternoon light, and the upward sweep the morning light. The gateway of the Botanical Gardens (opposite Magdalen College) is worth a plate, having been designed by Inigo Jones. Inside the gardens can be got some good subjects of Magdalen College and Bridge, &c. The old tower of St. Martin's Church (recently pulled down) may be thought by some to be worth a plate; it dates from 1034, or even earlier, but is probably somewhat different to what it then was, and certainly it looks down upon a very different scene.

To state with any completeness the architectural features connected with the various parish churches, and antiquarian remains of the ancient city, is impossible in the space at my disposal, and the visitors must be left to fill up any gaps with the help of the numerous guide-books published by booksellers on the spot.

Reginald A. R. Bennett, M.A. (Magdalen College),
Hon. Treasurer of the Oxford Camera Club.

NOTES ON THE REVERSAL OF THE PHOTOGRAPHIC IMAGE.

II.

Returning to the earlier periods, we note that shortly after the introduction of the Daguerreotype process it was found that if the exposure of the plates in the camera was unduly prolonged, the mercury was deposited irregularly over the plate, giving a pale blue image, with a partial or total reversal. Dr. J. W. Draper was, I think, the first to study this phenomenon, and he attributed it to an action of the rays of light analogous to those of heat acting on a mass of ice, the temperature rising gradually to 32° F., where it stops until the molecular change of liquefaction is accomplished, when it goes on rising again. In the same way, when the rays of light begin to act on a Daguerreotype plate, the silver iodide commences changing, and is capable of being whitened by mercury. This process goes on gradually with increased whiteness on the more exposed parts until a certain point is gained, when the iodide apparently undergoes no further visible change, but another point being gained, it begins to assume, when mercurialised, a pale-blue tint, becoming deeper and deeper, until at last it assumes the brilliant blue of a watch-spring, thus producing the effect called solarisation.

He gave no further elucidation on physical or chemical grounds at the time; but in a later paper ("Phil. Mag.," 1843) he maintained that the plate was polarised throughout its structure by the exposure to light. He says, "We know that iodine is not thrown off during exposure, but is absorbed by the underlying silver, while silver is liberated on the anterior surface of the plate. From the circumstance that iodine is evolved at the back of the film and silver at the front, the film itself remaining of the same thickness throughout, it is obvious that there is a strong resemblance between this phenomenon and that of the polar decomposition of water. The electro-positive and electro-negative elements are yielded up on opposite faces of the film, and its interior undergoes incessant polar changes, the opposite electrical particles sliding, as it were, on one another."

There is, I think, little doubt that some such action does take place; during the exposure there is a constant transference of atoms, till after a certain stage there is an excess of silver in the most exposed parts, and the mercury is deposited more readily upon the less exposed parts, or more or less equally all over the plate.

Draper also found the Daguerreotype plates were acted on by the red and blue rays of the spectrum, in opposite ways, similarly to the action noticed by Ritter with silver chloride.

Moser also examined the phenomenon of the solarisation of Daguerreotype plates, and attributed the gradual change in the developable condition of the iodised silver surface to the action of atmospheric oxygen, which is ever present and cannot be got rid of. This agrees with Scholl's theory, referred to in my lecture on the "Teachings of Daguerreotype," that there is a constant transference of atoms by the continual formation of silver oxide and silver iodide, their alternate decomposition and re-formation. The same principle probably applies to gelatine dry plates, in which, however, moisture diffusing through the colloid material, no doubt plays a more active part.

During the course of recent work on Daguerreotype, I found that plain metallic silver exposed to light showed this reversed action long exposure very distinctly when developed with mercurial vap and I had several instances of it, some of which I can show you. this case, of course, there is no halogen or electro-negative element sent except the atmospheric oxygen, together with the moisture of air. How far the change in the molecular structure of the film be due to their action, I am not prepared to say, but, as far as I h been able to ascertain, metallic silver is not oxidised by exposure light, and any action would more probably be catalytic, as in case of the iodide, according to Scholl's theory. ("Wied. Ann.," 149.)

Reversal with Collodion Plates.

The whole question of solarisation and reversal with collodion and dry plates, and with gelatine dry plates, has been very fully d with by Sir William Abney in his "Treatise on Photography," and Prof. Meldola in his "Chemistry of Photography," and so I need go further into the question than stating that it appears to arise, we have already seen, from an oxidation or rehalogenisation of reduction product formed by the first action of light. It is facilita by oxidising agents and hindered or prevented by reducing agen It is also facilitated by a preliminary exposure of the plate, wh causes a partial rehalogenisation of the sensitiser. A strong develo also favours reversal.

In 1875, during the course of some experiments in photographi the solar spectrum of dyed collodio-bromide dry plates, I constant met with reversals in the red or blue end of the spectrum, often bo simultaneously. Noticing that when the plates were quite clear of the reversal at the red end did not take place, while the direct acti only extended as far as C, and, recollecting Draper's principle of p vious exposure of the plate, I was able to obtain a reversed negati picture of the whole of the red spectrum up to and some little distan beyond A. In this case the lines appeared black on a clear groun and the plates were stained blue with a mixture of malachite green a methyl violet, known as "marine blue," but similar results were al obtained with plates stained with annatto, as well with other colouri matters and anilin dyes.

By another application of the same principle I found that very co plete reversed negatives could be obtained by first exposing one these stained dry plates for a short time to light, then placing it in printing frame under a negative, over the face of which a red gla was placed. After an exposure in the sun for about twenty minut and developing with alkaline pyro a very fair negative was produced.

When exposed under blue glass, however, these plates give quite mixed result, half positive and half negative. It is not impossible th suitable gelatine dry plates treated in the same way would produc similar results, and such a method would have many practical use I am sorry I have no specimens of the method to show you, but I hav brought with me two of the collodio-bromide plates of the spectrum one stained with a blue dye and the other with naphthalene red.

In April, 1876, when photographing the sun on similar blue-staine collodio-bromide plates, I had a case of recurrent reversal, but not t its full extent, of which an account is given in The British Journa of Photography, May, 1898. One of these plates showed, with a almost instantaneous exposure, an unreversed image; exposures of 5 t 10 seconds were fully reversed, and then as the exposures increase from 60 to 80 up to 200 seconds, the reversal was not observed exce just round the limb. The reversed images were all quite clear a sharp. With an unstained plate, the reversed images were those e posed for the shortest time, and then they gained strength accordi to the length of exposure. With similar plates prepared with coll dion containing annatto, the shorter exposures were well reversed then, as the exposure increased, the images of the sun were not s clear, but cleared again as longer exposures from 100 to 200 second were given.

Reversal on Gelatine Plates.

In 1879, Bennett stated that gelatine dry plates were very readily reversed by over-exposure, and showed this phenomenon of recurrent reversal very clearly, the image first gaining intensity up to a certain point, then losing it by over-exposure, to a point when the most exposed parts are perfectly clear on development, then increasing in density again, and then again losing it. ("Photo. News," xxiii. 139.) Sir William Abney has shown that in this case, also, the tendency to reversal is destroyed by exposing the plate bathed with a solution of potassium nitrite, while a solution of potassium bichromate will favour it.

In 1880, M. Janssen carried the observation of these recurrent reversals much further, and, by prolonged exposure, obtained six distinct stages.

1. The ordinary negative image.
2. The first neutral state, dark ground.
3. The positive image.
4. The second neutral state, clear ground.
5. The second negative.
6. The third neutral state, dark ground.

he second negative was calculated to require 100,000 times normal osure.

[r. Hugh Brebner recorded some interesting observations and results THE BRITISH JOURNAL OF PHOTOGRAPHY, 1888.

rof. Meldola has given a very full explanation of the chemical ons which probably occur during the different phases of these re- ent reversals. I must, however, refer those interested to his k (p. 225), giving here only his summarised scheme of the possible rse of events.

Br+Gelatine+O ... ... First stage.

uction product+ { Brominated gelatine+ oxidised products +HBr } +O — First negative.

Br+oxidised re- duction product+ { Debrominated and deoxidised products } +H_2O { First neutral stage and reversal.

le says: "A ray of light falling upon a sensitive plate is like the ive power driving a dynamo machine which is feeding a storage . When the charge of the latter has reached a certain point, it is able of reversing the motion of the system, and of converting the amo into a motor. The sensitiser plays the part of such a storage when it becomes charged, *i.e.*, halogenised, to a certain amount, chemical energy stored up in it begins to run down and reversal es place."

he action ascribed by Nernst to "electrodes which are reversible h reference to the anion," and illustrated by the action of silver oride in a solution of KCl, may, perhaps, be applicable to photo- phic sensitive films containing silver haloids.

As a proof of the important influence exerted by the organic sensi- r or halogen absorbent in bringing about reversal, we may note Sterry's interesting investigations on the organic and inorganic nt images (THE BRITISH JOURNAL OF PHOTOGRAPHY, xxii., 1898,), in which he shows that with the organic latent image the period eversal is very short indeed, and, compared with the inorganic, in- se re-reversal sets in quickly, even beginning after 30 seconds' ex- ure, while, with the most rapid plates, eight days' exposure at least s required for the re-reversal of the inorganic image, and, in the e of a slow plate, it was not nearly complete after two months' osure.

Mr. Sterry also says that "the bromine known to be liberated with h exposures cannot be considered simply as the direct cause of ersal, nor does it really destroy the latent image, though for prac- l purposes that appears to be the case, but its real action is to rd development, which will still take place if sufficient time is en."

n opposition to this view it may be interesting to note that Dr. Luther has quite recently enunciated the theory that solarisation is sed by the free bromine hardening the gelatine, and so rendering it permeable to the developer in the most exposed parts; so that, in he cases, the silver bromide is reduced more quickly on the less ex- ed parts than on the most exposed, and the result is the production a transparent positive. By retarding development in various ways, s tendency to reversal may be overcome. This theory, though pos- y applicable to gelatino-silver bromide dry plates could not be so to cases of reversal with other forms of sensitive plates in which the he phenomenon is observed.

Dr. R. Englisch has pointed this out in the "Archiv für Wissen- aftliche Photographie," ii, 230. He says that if we have to do with hardening of the gelatine film, the diffusion of solutions will be ected. Assuming that by prolonged exposure the sub-bromide is ac- lly formed, the amount of bromine set free will increase with the gth of exposure, and will exercise a strong hardening effect on the atine. The fixing solution will therefore be able to dissolve less er bromide from the hardened parts than from the unaltered parts, l if a plate treated in this way is then developed a reversal of the ge must result. By adding sodium thio-sulphate to the ferrous late developer, Eder obtained reversed images upon over-exposed tes. What happens in that case is not quite known, but here it ends directly on the reversed and separate actions of the fixing dium and developer. Englisch then describes an experiment in ich rapid dry plates were exposed to magnesium light in slips with mal and over-exposures sufficient to produce solarisation and loss density. After exposure the plates were divided in two. One set s developed, and the other placed in a 10 per cent. solution of hypo measured periods from one to five minutes, and then developed h metol soda, until the maximum density was attained. With the tes that had been in the hypo for five minutes, the slips which owed the greatest density on the directly developed plates showed ar glass, while the slips which were solarised on the developed plates veloped with full density on the partially fixed plates. The full sity of these plates was quite destroyed, but the sequence of the sities was entirely reversed, so that the solarised parts were the asest, and the normally exposed were the thinnest.

Reversal with Thio-carbamides.

In No. 11. vol. ii, of the same journal, Dr. Englisch has just given a very full and elaborate paper on the solarisation of silver bromide gelatine dry plates. It would, however, be impossible to discuss this and other valuable earlier researches on the subject by Bolas, Biny, Kogelmann, Hurter and Driffield, and others, within the limits of a short paper. Moreover, the conditions with gelatine dry plates are more or less special, the plates themselves are, as a rule, of unknown composition, and their working very varied, and so it may not be easy to arrive at definite conclusions of general application, when working with them. This difficulty I felt very much myself when investigating the action of the thio-carbamides in reversing the action of light on gelatine dry plates.

This curious action was discovered in 1890, quite by an accident. On adding a very minute quantity of phenyl-thio-carbamide (phenyl-sulpho-urea) to the ordinary alkaline eikonogen developer, I found that, on development, parts of the negative image developed as a transmitted positive, under otherwise quite normal conditions of exposure in the camera and of development. Later on it was found that thio-carbamide (sulpho-urea), thio-sinnamine (allyl-thio-urea), and other compound sulpho-ureas, had the same property, but the best results were obtained with a compound of thio-carbamide and ammonium bromide which was described by Prof. J Emerson Reynolds, in the "Journal of the Chemical Society," London, 1888, to which he gave the name Tetrathiocarbamidammonium bromide.

As in almost all cases of reversal, it was very difficult to ascertain the conditions necessary to hit off the exact balance between over-exposure and under-exposure of different parts of the picture, so as to secure a perfect reversal of the image, with sufficient transparence in the most illuminated parts.

The best results were obtained by using an eikonogen-lithia developer, containing:—

Eikonogen	1 part
Sodium sulphite	1 to 2 parts
Lithium carbonate	1 part
Water	100 parts

with about 1 c. c. per 100 c. c. of a saturated solution of Prof. Reynolds' compound salt. In some cases it was found useful to bathe the exposed plates in a preliminary bath to dilute nitric acid at 2.5 per cent. before developing, the acid being washed off before the application of the developer. In other cases bichromate of potash was added to the developer with good results. The development should be continued till the reversing action is complete, and if the image, after fixing, is found to be too dense, it may be reduced by treatment with bromide or chloride of copper, in solution at about 2.5 per cent., followed after a good washing by a second fixing in hyposulphite. I have with me several specimens of reversals thus obtained, also some heliogravure prints produced from the direct reversed positives.

What the chemical reactions are in this case it is difficult to say. Most of the sulpho-ureas are also solvents of silver haloids, or fixing agents, and they all have the property of strongly sulphurising them in an alkaline solution. We have already seen that fixing agents in large quantity may cause a tendency to reversal, but in this case the quantities present are so small that the sulphurising properties are likely to have a greater effect than the solvent. I have not been working at this method again, and so have nothing new to say regarding it more than I said before, that the thio-carbamide in the alkaline developer, by its power of sulphurising the haloid salt of silver in the dark and liberating halogen, caused the film to be in the same state under the developer as if the exposure to light were being continued, and halogen liberated all over it, as in the case of ever-exposure, and the image was reversed by the halogen attacking the parts reduced by the normal action of the developer, while the alkaline thio-carbamide caused a reduction of silver sulphide on the unexposed parts and gave a dense image.

Electro-chemical Action.

The great point of interest of this process was the evidence it gave of the electro-chemical action which takes place during development, and that reversal of the image during development is accompanied by an actual reversal of current. I am sorry I cannot show you this, but I have demonstrated it more than once, and have been able to show the distinct difference of current-direction between two similar pairs of bromised silver plates, one pair being placed in a normal developer and the other in the same developer containing a thio-carbamide. The same difference can be shown between the unexposed and exposed parts—such as a dark foreground and sky—of gelatine plates or films under development in the normal and thio-carbamide developers. I have followed the development of these reversed plates with a galvanometer, and found that the needle was deflected normally for a short time, and then turn back and went beyond zero in the other direction, which agrees with what actually takes place in the development.

This electric reversal seems to be explained by Skey's observations

("Chem. News," 23). He found that sulphides which have the power of conducting can also generate electricity, and that silver sulphide is positive to metallic silver. In a battery consisting of a sulphide and a metal in acidulated water the gas liberated is sulphuretted hydrogen, the nascent hydrogen exerting a desulphurising action upon the metallic sulphide, the ultimate effect of which is in some cases to completely reduce the mineral to the metallic state.

Though there is no doubt about the fact of the reversal of the normal electrolytic action during the development of plates by developers containing thio-carbamides, the way in which they act is rather difficult to ascertain, and requires a good deal of further investigation.

I have not been able to go into the question, but am inclined to think that electrical or electro-chemical action takes a great part in the ordinary reversals by long exposure. Prof. Bose has recently shown the similarity between the effect of electric radiation to produce rearrangement of atoms and molecules in a substance, and that of light in producing new atomic and molecular aggregation in a photographic plate, and states that he has been able to obtain evidence by experiment that the two phenomena are identical. He has shown that the continuous action of electric radiation produces oscillatory changes in the molecular structure, and that these periodic changes are evidenced by the corresponding electric reversals. Prof. Bose is, I believe, now engaged in working out the analogy between the two radiations more fully, and his results should be full of interest to photographers.

Besides these observations there are others tending in the same direction which could not be well discussed in the brief limits of this paper, already somewhat exceeded.

I have endeavoured to give a brief sketch of some of the principal methods of reversal that have, from time to time, been brought forward in ordinary photographic practice with silver salts, but there must be several other substances with which this phenomenon could also be well studied, though it is a point to which I have not hitherto given any attention. I received, a few days ago, a curious case of reversal in an under-exposed gum-bichromate print, which was sent to me by Mr. Wilson Noble. I do not recollect a case of the kind in my long experience with collo-chromate work, but I think it might possibly happen if the paper were old or had been exposed in a dull light and become partly decomposed, so that the shadows became greatly over-exposed and threw off the colouring matter which remained in the less exposed parts.

The whole subject of these reversals seems really to be little understood, and, no doubt, the study of parallel cases with other sensitive compounds would throw light upon the reversals occurring with silver salts, and the various instances I have brought forward may offer suggestions for further investigation.

J. WATERHOUSE, I.S.C., Major-General.

THE CARL ZEISS WORKS AT JENA.

[Abstract of an article in "The Idler" Magazine.]

I.

THE quaint old city of Jena in the German Grand Duchy of Saxe-Weimar is chiefly famous for three things. It has an unfading claim on history because Napoleon once marched through its streets and won a celebrated victory on the hills to the north—the battle of Jena—and in the present it is known the world over for its University and for its glass and lenses. There are glass works, if not lens manufactories, of far greater extent in other parts of the world than these of Jena, and yet Jena glass and Jena lenses have their own unique claims to distinction, especially among scientists. Not only in their processes of manufacture and in the perfection of their products are these works famous, but the management of their business affairs furnishes a most unique and fascinating study in social economy, for here the dream of an idealist has been given unique and wonderfully practical application, with the result that the working men of Jena have opportunities and rewards unequalled, perhaps, anywhere else in the world. And curiously enough, owing to the modesty of the originator of this scheme for the elevation of the working men and for the advancement of science very little has ever been published about it, and nothing in English so far as I can learn. With German conservatism, Professor Abbe has desired to give his experiment the test of years before recommending it by a formally published account.

For many reasons it is not probable that such institutions as these—for in reality they partake as much of the character of public institutions as of regular business enterprises—could have originated in England. They would seem to be a product typically German, a result in part of what may be called the German scientific temperament, and in part of the wave of commercial expansion now sweeping over Germany. Many years ago Professor Abbe, who then, as now, filled the chair of applied mathematics, natural philosophy, and astronomy in the University of Jena, became deeply interested in lenses and lens-making. He had seen the defects of the lenses in use astronomical and microscopical work, and he set himself to establish purely mathematical calculation the exact curves at which lenses w give the greatest possible effect with regard to the refraction and persion of the light, which passed through them. In other w he sought to form a new and scientific theory for making lenses. then interested himself in the modest lens works of Carl Zeiss Jena, and here he had lenses made according to exact scien methods. Before his time lens-making was largely a matter of perience and experiment on the part of highly skilled worku Professor Abbe succeeded in laying down exact mathematical form so that when a lens was ground with sufficient exactness to the r of the measurement it must of necessity be correct.

But it was not long before Professor Abbe discovered that th was the greatest inequality in the glass which he was compelle use in his lenses, that the power of refraction and dispersion of l varied widely with every melting, and he conceived the idea that exact chemical formulæ could be established for glass-making, and t if new kinds of glass could be produced by the use of other and hith untried substances, important new results might be obtained. other words, a complete revolution in glass-making was necessary order to accomplish the great results at which he was aiming. task seemed to be insurmountable, but it did not daunt him. His step was to interest Dr. Schott, of Witten, in the work. Dr. Sch was not only a thorough scientist, especially in chemistry, but he sessed a technical knowledge of glass-making, as it was then ducted. In 1881 the first smelting experiments were made in a sm laboratory erected in Jena for that purpose. There was a delibe plan on the part of the two scientists to solve by scientific meth the difficult problems of glass-making, though they involved not o the most advanced optical research, but the most difficult chem and technical manipulations, and Professor Abbe had clearly in v the possible establishment of a business enterprise based on the coveries which he hoped to make, should these be of sufficient portance.

Such an enterprise as this is certainly typically modern, and it m be significant as indicating how the great new industries of the fut are to have their origin. For two years Professor Abbe and Schott worked steadily; they tried making glass with all manner new materials, in many hundreds of different meltings, afterwa testing with the utmost care each variety of glass to ascertain optical properties. Almost at once they began to get promising sults, and after two years they were prepared to carry on th experiments on a larger scale, but this they did not have the me to do. In England or in America the work might have failed j at this point, but in Germany help came as help rarely comes outs of Germany. Professor Abbe laid his results before the Pruss Government, showed what had been done, and what needed to done, and the wide-reaching effect which favourable results mi have in every department of science—the possibility of making mic scopes, telescopes, and photographic lenses of hitherto unequalled finition and power, and of producing thermometer and barome glass which might advance the science of temperature and press determination. The Government at once felt the commercial app Germany must needs buy all of her glass for scientific purposes Paris or in Manchester, and here was an opportunity of building a new industry which would employ German workmen and b money into Germany. So the Prussian Government appropri 30,000 marks (£1,500) in 1883 and the same amount in 1884, to l the experiments carried forward. At the end of that time, so cessful were the investigators, that a regular glass-making establ ment was well under way, and there was no further need of vernmental assistance. In four years' time these glass works f nished a large proportion of the fine scientific and optical glass u in Germany, and now their wares are known everywhere in the wo —in the form of microscope and photographic lenses and prisms, thermometers, in chemical apparatus, and in the highest grades commercial glass. This little story is especially interesting as sho ing why Germany is making such extraordinary strides in commerc affairs. Out of science, assisted by the State, has sprung a new a profitable industry.

In all, over one hundred new kinds of glass were originated, a are now manufactured at the Jena glass works. In former tim glass was composed almost entirely of the silicates, potassium, le soda, and lime, and there were, roughly speaking, only two var ties: the old-fashioned standard crown glass and flint glass. Profes Abbe and Dr. Schott used no fewer than twenty-eight new su stances in glass-making: phosphorus, borax, magnesium, zinc, ca mium, bismuth, iron, mercury, antimony, tin, and others. Each these substances had its own peculiar effect on the refraction and d persion of light, and in doing away with or lessening what is kno as the secondary spectrum. Much of the glass thus produced h been ground into lenses at the Carl Zeiss Works, and the mic scopes which resulted gave a new impetus to every department science which has to do with minute forms of matter or of ligh

t would have been impossible for Dr. Koch and other great contemporary investigators in bacteriology, for instance, to have made he astonishing additions to our knowledge of the life of microbes nd bacteria had not Professor Abbe first produced a perfect or nearly erfect instrument for examining those low forms of life. In all of is published reports Dr. Koch as well as other scientists gives Professor Abbe a large share of the credit for these profoundly important discoveries in connexion with the germ theory. In the ame way the Jena microscopes have done wonders in the hands of uch men as Haeckel in laying bare the wonderful life processes of he lowest forms of plant and animal existence, in tracing the development of each, and in forming the great chain of proof of the heory of evolution. In the same way our present minute knowledge f embryology and the growing mastery of the details of that marellous machine, the human body, are due to the efforts of that nodest, hard-working professor of Jena.

The achievement of the investigators lay not so much in producing nicroscope and telescope lenses of higher magnifying power—that ervice science did not need—but in so perfecting the lenses that the mage would be clear and clean-cut, or in the words of the science, in securing perfect definition." A microscope which magnifies 4000 imes and produces such a blurred image of a cell that the investigator annot tell whether or not it contains a nucleus, is not as valuable to cience as one that magnifies 500 times and brings out every minute letail distinctly and sharply. And that is also just the distinction between a good and a poor photographic or telescopic lens. Professor Abbe also introduced the system of "oil immersion" and other great nicroscopic improvements. Indeed, he may be justly called "the ather of the modern microscope."

From the investigations begun thus in a laboratory by Professor Abbe and Dr. Schott, have sprung two great manufacturing plants, eparate and yet allied, neither of which is able to keep up with the present demand for its product. We visited the Schott Works on he hill above Jena, where all the new varieties of glass are made, nd afterwards at the Carl Zeiss optical works we saw this glass round and polished with infinite care and precision into lenses and risms.

R. S. Baker.

Studio Gossip.

Sunday Photography.—Mr. Archer Clarke writes: "May I draw your ttention to the fact that in the royal parks in London photography is orbidden if a stand is needed, but allowed if hand cameras are used. Evidently it is the tripod that works the mischief, and not the photography. Is that not funny?"

"Home from the Veldt."—A recent issue of the "Dundee Evening Telegraph" contained a number of portraits of local volunteer officers ately returned from the war. The series included one of Captain Alisair Valentine, a director of the well-known firm of photographic printrs and publishers, Valentine and Sons, Limited, Dundee.

Another Picture Exhibition.—At present London has no lack of picure shows, another loan collection being opened last week at the Bermondsey Settlement. Four rooms in the building are set apart for the ictures, some 125 in all. The collection includes examples of the work f such artists as Sir Joshua Reynolds, Holbein, Sidney Cooper, David Roberts, Watts, Goodall, E. M. Ward, Dicey, Wimperis, Herkomer, Sir John Gilbert, and many others. It should be mentioned that with all hese loan exhibitions the public have the opportunity of seeing works which they cannot at any other time, as they are all lent from private collections. Therefore the opportunity, while it lasts, should be availed of.

At the last meeting of the London County Council, Mr. Organ asked the Chairman of the Parks Committee whether his attention had been called to the fact that the members of the Royal Photographic Society and the societies affiliated thereto are not required to obtain special permission to photograph within the Zoological Gardens. And, further, whether he would bring this fact under the notice of the Parks Committee with a view to similar facilities being afforded in the London parks belonging to the Council. Replying to Mr. Organ, Lord Monkswell stated that he would bring the matter under the notice of his committee, and made the suggestion that perhaps the case would be met by the issue of special permits by the Council to the members of the societies.

Another Richmond in the Field.—With the title of "An International Race for the First Invention," the "Daily Mail," of May 25 printed the following announcement. How many more times will the daily newspapers be made the vehicles for this sort of thing? "Mr. Montague Barstow, of London, is keenly interested in the report published in the 'Daily Mail' of an invention on the part of M. Gurtner, of Berne, of a process of photography in natural colours, for he has one in a forward state himself. He thinks it unlikely that two entirely different processes would be invented at the same time, and he is most anxious to be out first, so as to get all the credit. Mr. Barstow told a 'Daily Mail' representative yesterday that he was collaborating in this business with a French artist, who was the actual inventor. Their process was a purely photographic one, inasmuch as it depended upon the effect of light on different chemical substances. It had quite passed the theoretical stage, and a good print had been produced fifteen months ago. The results obtained are, as far as can be judged, permanent, and are of an exceedingly delicate and beautiful character, resembling as much as anything pale water-colour drawings, the colours being true to nature. All colours are secured, the reds and greens being exceptionally brilliant."

The National Photographic Record Association.—The work which is carried on by the National Photographic Record Association, a body founded in 1897 with the purpose of making a collection of photographs illustrating the scenery, life, customs, and history of the time, needs no commendation at our hands. The National Collection, deposited in the British Museum, will form a most valuable record for future ages of the present times. It appeared from the report presented at a meeting last week at the Midland Grand Hotel, St. Pancras, that the Association is making good progress, and has received 669 prints, in the past year. Many of them were on view, among the most interesting being those by the President, Sir Benjamin Stone, of the celebration of Floral Day, May 8, with its "Furry Dance," at Helston, in Cornwell; the views of notable London houses, such as those in which Sir Isaac Newton, Disraeli, and Sarah Siddons lived, by the Hon. Secretary, Mr. George Scamell; and several from the London estate of the Duke of Bedford. Among those present at the gathering were Sir E. M. Thompson, of the British Musenum; Sir H. T. Wood, Society of Arts; Mr. G. A. Storey, R.A., Mr. C. Purdon Clark, Victoria and Albert Museum; Mr. L. Fletcher, Natural History Museum; Mr. C. Welch, City Library; and Mr. P. Norman, Society of Antiquaries.

News and Notes.

Hackney Photographic Society. — Mr. H. W. Bennett lectured on and demonstrated the "Carbon Process," at the meeting of this Society on the 21st inst.

The Röntgen Society's next Ordinary General Meeting will be held on Thursday, June 6, 1901, at 20, Hanover-square. The chair will be taken at 8.30 p.m. A paper will be read by Dr. Hugh Walsham on "X-ray Diagnosis of Aneurism," with lantern demonstration.

Magnalium.—The latest catalogue of photographic lenses issued by Messrs. Voigtlander and Son, 92, Hatton-garden, E.C., contains the following announcement with reference to magnalium: "In addition to endeavouring to make the optical portion of our lenses as perfect as possible, we are introducing mounts made with the new metal, magnalium. We think this new metal will be greatly appreciated, as, though slightly lighter than aluminium in weight, it is as hard as brass. We have adopted magnalium wherever possible, and especially for all lenses used with hand cameras, and this without any increase of price."

In connexion with the Industrial Department of the Blairgowrie and Rattray Horticultural Society's Exhibition, to be held from the 23rd to the 25th of next July, there will be an open competition for photographs of flowers or fruit. We append the portion of the schedule referring to this competition. Section VII. Photographic — Best photograph of flowers or fruit (photographs must be mounted, but may be framed or unframed). A silver and a bronze medal are offered, subscribed for by members of Blairgowrie and District Association. Entries must be forwarded not later than July 17. The Hon. Secretary is Mr. D. G. Monair, "Advertiser" Office, Blairgowrie.

Photography for the Press.—In this useful volume published by Messrs. Dawbarn and Ward, 6, Farringdon-avenue, E.C., price one shilling, it is pointed out that the constant increase in photographic illustrations, as well as in the number of illustrated journals, has created a new and profitable market for photographs of interest to the public. The suggestions and information considered essential to success fall under two heads: (1) the relations of the photographer and the editor to whom work is submitted, and (2) technical methods. The first part of the book touches upon simultaneous submission to several journals, fee to be charged, miscellaneous right of reproduction, obtaining commissions, submitting through an agent, &c. An appendix is given containing a list of illustrated journals, with official data as to their days of publication, latest times for acceptance, and dates of payment.

Sun Spots.—During last week a spot of considerable size was seen by telescopic aid near the Western border of the Solar surface. The subject of sun spots was largely dealt with by Dr. W. J. S. Lockyer, in a paper which he read before the Royal Society on Thursday, last week, on "Solar Activity, 1833-1900," which helps to explain some anomalies in the ordinary periodic occurrence of spots on the sun's disc. In his paper Dr. Lockyer says that it has been ascertained that these rise to a maximum and fall to a minimum, roughly speaking, every eleven years, but he adds that careful study has disclosed minor irregularities such as the recent retardation of the minimum, and he has come to the conclusion that the eleven year period of sun spots is modified by a second and independent periodic change which has a cycle of about thirty-five years, and that there is a corresponding cycle to the total spotted area included between any two consecutive minima. The prevalence of spots on the sun is usually attended by a considerable increase in the temperature, so that now the spots have passed their minimum, we should expect considerably warmer weather, and, perhaps, a hot summer.

Dinner to Dr. Hall-Edwards. — Members of the Birmingham Photographic Society entertained Mr. Hall-Edwards at dinner at the Old Royal Hotel, last week, and extended to him their congratulations on his safe return from his duties in South Africa in connexion with the

Imperial Yeomanry Hospital, to which he was surgeon radiographer. Mr. G. F. Lyndon (President of the Society) occupied the chair; and amongst those present were, in addition to the guest of the evening, Dr. Addenbrook, Messrs. J. Howard Collins, R. Haines, P. B. Rider, F. W. Pilditch, P. T. Deakin, W. T. Greatbatch, E. T. Greatbach, A. J. Leeson, E. Johnson, H. V. Cornish, A. C. Gilbert, F. Lewis, A. Fenn, G. Whitehouse, B. Moore, G. Helps, A. C. Scrivener, and B. R. Walker. The chairman gave the usual loyal toast, and then submitted the health of the guest of the evening. He said they could not allow Mr. Hall-Edwards to return to the Society without offering to him at least as warm a welcome as any other volunteer who had returned from active service. It was an honour to Birmingham to have one of its citizens selected to perform such important duties.—Mr. Hall-Edwards, in replying, described the Imperial Yeomanry Hospital as the best-equipped hospital that ever started from the shores of any country in time of war. To a great extent the luxury which surrounded the hospital was due to the people of Birmingham. They would recollect that over 1200 bedsteads and their equipment were given by the Birmingham manufacturers. It was impossible to walk about the hospital without being reminded of the good feeling of the people of Birmingham. After relating his photographic experiences, which to the members proved very interesting, he gave his opinion that the war would not come to an end just yet.

THE Guild.—The following particulars of "The Guild," a recently formed Leeds Photographic Society, show that the latest addition to the long list of societies is to be conducted on somewhat original lines:—1. "The Guild" shall consist principally of photographers working on artistic lines. 2. It shall possess powers to elect to its honorary membership—(a) Any person who has done good work in connexion with photography or its branches; (b) Anybody who, in the opinion of its ordinary members, shows a disposition to further its aims and objects, or who may probably be able to advance them even if in an indirect manner. 3. The management shall consist of an Hon. Secretary, and a committee of three, two of whom shall be permanent for the first four years. The principal objects shall be two in number—(1) To provide social meetings for the interchange of ideas, for criticism and advice, and for the advancement of photography in general, in a manner not ordinarily undertaken by societies; (2) To afford to photographers and those not specially interested in photography a better means of keeping in touch with the advancement of photographic science, and an opportunity of studying some of the best work that can be obtained—(a) By the formation of a permanent photographic art gallery, preferably in Leeds; (b) By loaning pictures to exhibitions or to individual societies; (c) By affording, when possible, to societies or individuals, opportunity of studying pictures by workers of standing. The permanent collection shall be made—(a) By the contributions of "The Guild," limited, so as to prevent an excess of works produced by its membership; (b) By the purchase of pictures shown at leading exhibitions; (c) By the selection of pictures offered for sale at such exhibitions as shall have been assisted by "The Guild." (d) By the aggregation of good works as gifts, taken in exchange, or obtained in any other manner decided by "The Guild." When large enough the collection shall be offered, free of charge, to the Municipality of Leeds, or to some other body, with a view of forming the nucleus of a permanent photographic exhibition. Rules—1. Election to the membership shall be by invitation, and must be by unanimous ballot. 2. There shall be an Hon. Secretary-cum-Treasurer elected annually (the outgoing Hon. Secretary to be eligible for re-election), and three members of committee; and a chairman appointed at each meeting for such meeting. (2a) The committee shall consist of Mr. J. H. Gash and Mr. P. Sheard, who shall be regarded as permanent members for the first four years, and the third member shall be appointed at the annual meeting. (2b) The Hon. Secretary shall be considered as an hon. member, but shall retain the rights and privileges of an ordinary member.

THE late H. P. Robinson's Photographs.—From Mr. Ralph W. Robinson, of Linkfield Corner, we have received an illustrated catalogue of the late H. P. Robinson's "Pictorial Photographs." To this neatly produced little book Mr. George Davison contributes the following biographical note:—"There are but few of those who practise photography in one or other of its many departments who do not know that the history of pictorial photography has been deeply influenced by the famous series of combination and other pictures which have issued from the hands of the late Mr. H. P. Robinson. It is to be hoped that his great example and influence will not be allowed to lose its effect, or his mark upon the history of the art forgotten. It seems to me that it should be one of the duties as well as pleasures of our photographic societies and institutions, and also of individuals who have a personal interest in photography, to make collections of the best works of the past, and very prominently in such a collection there should be a representative series of the pictures produced by Mr. Robinson. He, of all other teachers and workers, has done most to instruct and train those interested in pictorial photography, and all over the world the impulse of his example and precept has been felt. The world of photographers is divided up into coteries and every individual has his personal preferences; but, even in these latter days, when so many new departures have varied and enlivened photographic history, the first place is still given by common consent to Henry Peach Robinson. He will always be remembered as a man who, in the height of his career, stood head and shoulders above his fellow-workers. This he effected by strength of character, by his capacity for work and taking pains, and by a keen appreciation of and feeling for pictorial effect. His famous combination pictures always had a decorative appearance and were full of personal interest. Many of these photographs have been the chief attractions in past exhibitions. 'Bringing Home the May,' 'Dawn and Sunset,' 'Carolling,' and, in a slightly different vein, 'A Merry Tale,' and 'Old Dapple,' are a few of the landmarks in a province which was peculiarly his own. The tell effect which he secured in his combination work was characteristic his methods, and could hardly have been obtained so strikingly by other means. He was the greatest man in his time amongst photogra ers." Mr. Ralph Robinson supplies the following particulars of the known photographs:—"The negatives produced previous to 1877 h been only partially preserved and few are in a condition to print fr direct. For instance, the negatives of 'Fading Away' (1858) were troyed by an accident while printing; of 'Bringing Home the M (1863), the original negatives exist in fair condition, but not arranged printing, and to reset them would involve so much work that it only be undertaken should a fairly large demand be forthcoming prints at £3 3s. each (size 38 by 15). These two pictures, with 'The Lad Shalott' (1861), and 'Sleep' (1866), are typical of the first period his career, previous to his going to Tunbridge Wells. The best pri procurable of these pictures have been copied to the largest size shape of the individual pictures will admit on a 15 by 12 plate. 'W the day's work is done' (1877) is the last picture by the collodion p cess; it is made up from six separate negatives, which are arranged complete the picture in three printings. The picture was followed b large landscape and figure series including 'Wayside Gossip,' 'A Me Tale,' &c., not combination prints (1881-1884). 'Dawn and Sunset, worthy companion picture to 'When the day's work is done,' was p duced in 1885, 'Carolling' 1887, 'Morning Mist' 1893, and 'Stc Clearing off' 1894. These include probably the best known works are typical of the rest." The negatives are now in the hands of Ralph W. Robinson, who is prepared to supply prints. Having b long associated with his father in this work he is well acquainted w the negatives. All negatives suitable for sepia platinotype will be prin by this process."

Commercial & Legal Intelligenc

A CATALOGUE of photographic apparatus and materials has been issu by Mr. Robert W. Paul, 68, High Holborn, London, W.C.

MESSRS. George Pulman and Sons, Ltd., announced that they ha purchased the Art Printery known as "The Cranford Press, Chiswick

WE have received the abridged price list for developing, printing, a enlarging photographs, issued by the Muswell General Photograp Company, 68, High Holborn, London, W.C.

THE Convention.—Messrs. Marion and Co., of Soho-square, inform that they will have a display of novelties in photographic goods at t Roebuck Hotel, Oxford, during Convention.

THE new catalogue of Mr. Andrew H. Baird, Lothian-street a Brighton-street, Edinburgh, extends to about 100 pages. It is copiou illustrated, and forms an excellent guide to purchasers of all descriptic of photographic apparatus.

THE following are the awards in Messrs. W. Butcher and Sons' "Lit Nipper" Trade Competitions.—No. 1. For the best set of six negati of general subjects: First prize, one guinea, has been forwarded Mr. H. E. Brightman, c/o Messrs. E. Brightman and Son, 39, Colst street, Bristol; second prize, half guinea, has been forwarded to Mr. R. Lewis, c/o Mr. W. G. Lewis, Seymour-street, Bath. No. 2. For t best photograph of a display of "Nipper" cameras, photographed with t "Little Nipper": Prize two guineas, has been forwarded to Mr. Bowman, c/o R. G. Posgate, 11, Vine-place, Sunderland.

OLD Plates in New Boxes.—Dry plate makers and others interested the photographic trade in the Colonies should take warning by a le which has recently been received by one of the best known firms of ma facturers of dry plates in England. The letter has been shown to in confidence, and names are therefore withheld. In it the writer s he is returning to the colonies with a stock of photographic mater and then adds: "I am open to purchase any quantity of spoilt batc of dry plates, any sizes, if you would care to sell any you may have. would put them up in boxes of my own. I have bought a large quant and they would do to mix up to sell in the Colonies at a cheap rat Colonial dealers and photographers should profit by this hint, and o purchase plates packed in boxes bearing the labels of well-known Engl firms.

A DELICATE Compliment.—The "Te Aroba and Ohenemuri New (published at Te Aroba, New Zealand) contained the following intere ing announcement in its issue of March 26: "Mr. S. T. Scott, pho grapher, desires us to state that he has just opened his new stud opposite the Domain, which is to be called 'The Warwick Studi named after the celebrated dry plate manufacturer in England. T length of the studio is 33 feet long by 14 feet wide. As the buildi was specially erected for Mr. Scott, with every facility for lig shades, &c., he is now in a position to fulfil orders in all kinds weather. The class of work produced by Mr. Scott speaks for itself to his ability as a photographer."

RE Robert Thomas Ford, Photographer, King-street, Egremont. This debtor in the course of his adjourned public examination at t Birkenhead Bankruptcy Court, stated that he had amended his d ciency account, and also his statement of affairs. The official recei said he was satisfied with the accounts debtor had filed, and he did n propose to ask him any further questions. In reply to Mr. Tobin, w appeared on his behalf, debtor said he had attributed his failure to t fact that Mr. Edwards took possession under a bill of sale given him. Owing to that, he brought an action against Mr. Edwards

izing the furniture, under what he alleged to be an invalid bill of le, but he was unsuccessful in his action. He had never been in the ankruptcy court before, neither had he compounded with his creditors, made an assignment to a trustee. The debtor was eventually allowed pass his examination.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
3	Walthamstow Photo.	Ordinary Meeting.
4	Gospel Oak	*Exposure and Development.* W. Kilbey.
5	Birmingham Photo. Society	Excursion: Sutton Park. Leader, W. T. Greatbatch, F.R.P.S.
5	Borough Polytechnic	*A Few Chemical Experiments for Photographers.* F. W. Bannister.
5	Edinburgh Photo. Society	Election of Office-bearers and Councillors
6	Hull	Monthly Meeting.
6	London and Provincial	*Pictorial and Decorative Work.* Walter D. Welford.
6	Röntgen Society	*X-ray Diagnosis of Aneurism.* Dr. Hugh Walsham.
8	Borough Polytechnic	Excursion Carshalton. Leader, F. W. Levett.
8	Croydon Microscopical Society	Excursion: Cheam and Epsom.
8	Liverpool Amateur	Excursion: Prenton, Landican, and Storeton. Leader, W. A. Taylor.
8	Walthamstow Photo.	Excursion: Mansion House.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 23,—Mr. J. E. Hodd in the chair.

Mr. J. W. Hodges showed prints from two negatives of the same subject—a view in St. Bartholomew's Church—taken on an ordinary plate in one case, and in the second case on a plate that is issued as proof against halation, but the second as well as the first was affected with halation.

Mr. T. E. Freshwater said he had never seen a photograph of this particular subject that was free from halation.

Mr. A. L. Henderson said that it would be remembered that during a long exposure with such subjects as these haze often gave the effects of halation.

Mr. A. Mackie thought the difference was really due to the fact that the relative exposures were different.

Mr. T. K. Grant thought that one must draw a line between visible haze and its effects, and the same kind of effect produced by halation. Until a lens of discriminating power could be found, things would be as shown. An isochromatic screen often improved matters.

Mr. R. P. Drage thought it impossible to absolutely prevent halation, although some plates very nearly did so.

Mr. A. L. Henderson showed a form of self-moistening press-copying brush applied in photography as a plate backer. The backing medium is contained in the receptacle where usually the water is placed, and by means of a rubber bulb and valve on the end, it is forced out as the brush is passed over the back of the plate.

Mr. Henderson then gave a lantern display upon—

Acqui

accompanied by descriptive notes from which the following is taken. Acqui, in Italy, is situated on the banks of the R. Bormida, in the province of Montferrat. It possesses bracing air with a genial climate, special advantages seldom found together. It is a place celebrated for its mineral water springs, the Romans in their time having turned them to account. There are four bathing establishments, two belonging to the State. The springs deliver their waters at different temperatures, from boiling to a very low degree. Mud baths may also be had at Acqui, and, indeed, the place is famous for them. Mr. Henderson, who had to work very hard to get the slides ready for the meeting, showed some very fine pictures, the colours also being pleasing. Many of them were panoramic, and the others were largely stereoscopic. An excellent idea of the surrounding country was given, of the natives and their quarters.

The lanternist reported that the magnesia cylinder used in place of the ordinary lime had worked very well, and of its good lighting properties the meeting itself was well able to satisfy itself.

A vote of thanks was passed to Mr. Henderson, who referred in his closing remarks to the great immunity of Paget XXXXX Plates from halation. Exposures on them varying from one and a half hours to one-fiftieth second had been given, and out of 850 exposures there had not been a dozen failures.

Croydon Camera Club.—There was a full house on Wednesday evening, May 22, when the "Hand Camera of To-day" was exhibited and described by a number of members. First to take the floor was Mr. F. O. Bynoe, who made a strong point in emphasising that the cameras he showed were the products of British skill and labour. In the "Penna" was seen a most ingenious collapsible camera of the Anschutz type. It had several remarkable contrivances, and besides working with an "F.P." shutter, rejoiced in being fitted with one of the celebrated Beck-Steinheil lenses. The "Folding Frena" came next, and its universality and certainty of changing were suitably dwelt upon. That one may use forty flat films or a dozen dry plates with it and employ it for all kinds of work are valuable points. It is a camera which should last a lifetime, and satisfy its owner as well. Mr. Salt followed by showing and explaining the Guinea Xit (Shew and Co.), which is probably the best value for money which can be obtained. It folds into pocket size, has three double backs, focusses, and can be used in the hand with a shutter, or on a stand. Two other more expensive makes on the same principle were also inspected. Mr. Price next exhibited the "Premo" (5 by 4). It is, in many essentials, similar to a No. 4 Cartridge Kodak, but slightly smaller, and uses plates instead of rollable film. A Busch lens and Unicum form of shutter are fitted; price, including case, &c., is only £3 15s. Mr. Hicks dwelt on a make which will do almost anything that a hand camera can hope for. It was of a fearsome number of parts and movements, but withal splendidly devised and made—in fact, a triumph for British craft. The camera is known as the "Newman and Guardia." This is no flimsy featherweight kickshaw, but scales nine pounds, and costs about £25. Mr. Rogers showed a Dallmeyer box hand camera, chiefly notable for the double backs being fitted with a door-opening arrangement instead of a pull-out shutter. Mr. Isaac displayed a camera he has successfully used for many years, made by a former member, Mr. G. H. White. Mr. Salt also showed a home-made hand camera which had many good points. A considerable proportion of the hand cameras on view were available for stereoscopic photography thus—Mr. S. H. Wratten brought forward McKellen's "Infallible," which will at pleasure take a pair of stereo views or two different quarter-plate negatives; Mr. Jeffery explained a neat and well-made pattern, known as the Edison stereo hand camera. Finally, Mr. Edgar showed a strong and compact stereo hand camera of his own design and construction. It had several novel and useful points and was a fine example of mechanical handiwork.

Patent News.

The following applications for Patents were made between May 13 and May 18, 1901:—

Camera.—No. 9857. "An Improved Hand or Stand Camera for Photographic Purposes." Alexander Stocks Watt.

Cameras.—No. 9973. "Improvements in or relating to Photographic Cameras." Complete specification. Stuart Edward Parker.

Printing Paper.—No. 9983. "An Improved Sensitised Paper for Photographic Printing." (Redfield Benjamin West, United States.) Henry Harris Lake.

Dishes.—No. 9992. "Improvements in Trays or Dishes for Use in Photographic and like Processes." Wilfrid Lean.

Cameras.—No. 10,033. "Improvements in and relating to Cameras for Photographic Purposes." The Birmingham Photographic Company Limited, and Frank Alston.

Three-colour Photography.—No. 10,043. "Improved Folding-plate Carriers (or Sheaths) and Reflecting Screen (combined) for producing simultaneously three Negatives (or Positives) with one Lens and one Exposure." William Norman Lascelles Davidson.

Film Clips.—No. 10,171. "Film Clips for Developing." Boris G. Norischkine.

Film Changing.—No. 10,205. "Improvements in or relating to 'Daylight' or other Changing of Packages of Photographic Cut Films or other Sensitive Surfaces arranged as a Pack, and Apparatus therefor." Arthur Lewis Adams.

Automatic Printing Machine.—No. 10,304. "A New or Improved Automatic Multiple Photo-printing Apparatus." (Georges Lantuejoul, France.) Arthur Freemore Spooner.

Projection.—No. 10,361. "Improved Method and Apparatus for projecting a Visible Image of Opaque Objects." Walter Pelham Warren.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

AMERICAN COMPETITION AND OTHER MATTERS.

To the Editors.

Gentlemen,—Much has been said lately about the position occupied by Great Britain in respect of her commerce. Many authorities and impartial writers have not hesitated to point out that in several important respects we are falling behind in the struggle for commercial prosperity. One bolder and more pessimistic writer has prophesied that this country will be bankrupt in ten years, if we do not mend our ways. In all probability, many people will consider that the subject has been discussed ad nauseam; but of one thing there can be no doubt: a vast amount of manufactured material is imported into this country which, one would think, might very well be made here.

The photographic industry may be regarded to a great extent as a sort of barometer. Amateur photography—although it is by no means easy to define the expression—is, at any rate, a luxury, and one would think that if the photographic industry is in a healthy and increasingly prosperous condition, it may be assumed that the condition of the country generally, as regards prosperity, may be regarded as set fair. The photographic dealers throughout the country, and, of course, the manufacturers, will be able to tell us, or give some indication as to what sort of a year the present is likely to be, from their point of view, and indirectly, a general idea of the prosperity of the inhabitants of this country. Judging from the difficulty the writer has experienced in obtaining certain advertised goods, the year is likely to be a very profitable one to the manufacturers and the dealers. It seems to the writer that three weeks or a month is rather a long time in these days to have to wait for goods. It is just here, in the prompt delivery of advertised goods, where there is plenty of room for improvement, and if British manufacturers cannot wake up to the fact that the customer deserves some consideration, enterprising Americans will be welcomed. Perhaps the best thing to do is to order the goods in the winter time when the manufacturers and the dealers are slack; but the ordinary person does not then know what he will want, whereas the manufacturer might very well anticipate a demand, based on past experience.

There is no doubt about one thing: if the Americans can find weak spots in the British system of supply they will endeavour to promptly remedy the defects. They are determined to find markets for their goods in this country, and there is not the slightest doubt they are doing so to an increasing degree. This JOURNAL has more than once called attention to this subject, so far as it affects the photographic industry, and it was somewhat severely criticised in certain quarters for doing so. British manufacturers are naturally inclined to be prejudiced, but they must be blind indeed if they fail to recognise that the comments made in this JOURNAL were not to a great extent true. American competition is, of course, inevitable. American manufacturers of photographic apparatus and photographic goods generally have evidently got on the right side of the dealers, and for a few pounds any dealer can make a brave show of American cameras. The manufacturers evidently make it worth the dealer's while to push them, and it is not an exaggeration to say that in many of the smaller retail establishments throughout this country American stock predominates. The American manufacturer evidently studies the British-made article with the idea of improving it and reducing its price; and he frequently succeeds in doing both. This is a plain statement of fact which can hardly be controverted. It is generally recognised, however, that a great deal of the best photographic apparatus is made in this country, but there is a very large class who can never afford to have the best. There is a large class, too, who will never recognise that the cheapest goods initially are not always the cheapest in the long run. These classes have to be catered for, and the American manufacturers evidently intend to do their best in this respect.

The Secretary of the recently formed Photographic Trade Association, writing in this JOURNAL recently, said: "However popular they may have made their principle—'You press the button and we do the rest'—can it be doubted what the verdict would be if Kodak, Ltd., or any one were to take a poll of, say, the photographic societies of the United Kingdom as to whether film cameras or plate cameras are preferable for any one working for the love of, and in the true interests of, the photographic art?" Surely this is a curious position for British dealers to take up. The recently adopted Kodak policy, in the writer's opinion, should be fought to the utmost; at the same time, it would be unjust to deny that the Kodak Company have played a very important part in the popularising of photography. The Kodak Company, fortunately, do not prohibit any one developing their own films if they wish to do so, although they will "do the rest" if desired. The first business of a commercial company is surely to put forward a saleable article, and this the Kodak Company have certainly succeeded in doing. And the Kodak Company do not prevent any one affixing the highest quality lens to any of their instruments. Certainly, when using roll film one has to pay for the convenience, roll film, or perhaps more correctly Kodak roll film, being about three times the price of plates. But there is a very large class who evidently consider that the convenience of film is worth paying for, and, although most films are inclined to go wrong sometimes, thousands of good negatives have been taken with it. It would therefore seem that the remark above quoted, while exhibiting a curious conservatism on the part of the manufacturers and dealers comprising the Photographic Trade Association, is not quite fair. And it is American ingenuity which has been mainly responsible for the enormous trade in roll film. It is surely rather for the user than the maker or dealer to consider whether a film or a plate camera is preferable for any one working for the love of, and in the true interests of, the photographic art. Moreover, the manufacturers of plate cameras have undoubtedly been materially benefited by the popularising of film photography due to American enterprise, for many who have been thus induced to take up photography have subsequently purchased plate cameras, while retaining the film camera as a part of their photographic equipment. While plate cameras will doubtless always be used, British manufacturers have, generally speaking, failed to recognise the possibilities of film, and the Secretary of the Photographic Trade Association explains why such has been the case. It would be interesting to know what the Frena people have to say on this particular point.

American manufacturers of plates are, it seems, to invade this country. What effect this will have on prices it would be difficult to say. One would have thought that the supply was already sufficient. Will it mean a reduction in price? Photography would probably be a more profitable profession if the price of plates were considerably dearer. Can British manufacturers afford to reduce their prices? These questions must be left to that somewhat obscure organization, the Plate-makers' Association.

There is one aspect of the American invasion which will doubtless be considered whenever our authorities have time to deal with it: have we not a right to consider that those American manufacturers who are finding this country a convenient and profitable market should pay something of their profits to the national exchequer? The Free-trade-all-round policy will probably be adopted when the millennium arrives. For many years this country has adopted a Free Trade policy. The Americans, on the other hand, seem to consider that the imposition of high protective tariffs is necessary to their prosperity. They seem to be in favour of America for the Americans, and the rest of the world besides, so far as trade is concerned, and they make a good deal of noise whenever countries impose retaliative tariffs, which have the effect of curtailing the sale of their goods. All American goods might bear an imprint "Made in America," and a small tax on many American goods would not do anybody any harm, so far as can be seen.

At the same time, it must be recognised that there is more than one aspect to this question. A general policy of protection would probably be harmful to the best interests of this country, but revenue to meet national expenditure must be obtained. We surely may as well tax certain imported goods—goods which cannot by any stretch of the imagination be considered necessaries of life—as to increase the income tax.

No one can have any sympathy with so-called Englishmen who take a fiendish delight in finding fault with everything British. When one glances at the map to compare Great Britain with America; when one knows the resources of the latter country, one can only feel proud that Great Britain has accomplished so much. But we cannot stay the forces of evolution. America means business, and American manufacturers are determined to find markets for their goods. The May number of the "Engineering Magazine" contains some very interesting editorial comment concerning the American Steel Trust more particularly; but as the remarks are generally applicable, I might be allowed to quote from them. The writer says:—"If, while handicapped by antiquated and wasteful ways of doing things, she (Great Britain) is yet holding a leading place as the world's workshop, need she despair of the results which will follow when she has fully equipped herself according to the latest ideals of economical mechanical production? It would be foolish to maintain that the phenomenal natural resources of the United States do not give them a permanent industrial advantage, or that there is not a tendency for industrial ascendancy to pass to the land so endowed. The point is that this is not the whole of the case, nor the only important consideration. National temperament, adaptiveness, stability of character and institutions, commercial ability, political and economic soundness, all are influential, and the result is a product of all the factors. Overconfidence in the strength of one's own position, and indifference or inattention to the qualifications of rivals, are the most disastrous attributes. . . . . Great Britain's awakening has been startling, but promises to be thorough. With her magnificent political stability, her sound economic system, and her dogged courage—and, after all this, with the 'cashing in' of her yet unrealised asset of possible labour-economy—she is so far from 'decadent' that the suggestion is ridiculous."

Those British firms which have adopted economical, scientific, and organized methods of production have more than held their own with the best of American firms. Still, there can be no doubt that we are importing an immense amount of photographic apparatus and material. American manufacturers work in a very big scale. They specialise and standardise, and can thus manufacture economically.

Mr. Andrew Carnegie, in a recent speech, urged British manufacturers to first see that their control of the home markets was secure. Certainly in the photographic trade this remark might be kept in view, although, of course, it is not desirable to neglect foreign markets.

The Photographic Trade Association might do good work by fostering home inventions and applications. Some of the wholesale agents who are members of this Association are ready enough to im-

apparatus and boom it for all it is worth. Too much of our ce seems to run to seed, so to speak. Indeed, some of our tific men seem to consider it undignified to put their knowledge ractical purposes.

ie photographic film trade has been too long neglected by British ufacturers. Now, however, through the action of the Kodak pany, the home-manufactured article is likely to be fostered. us hope, too, that the home-manufactured roll film camera will be ured in a similar manner.

ie Kodak Company must be given credit for their ingenious im- ations, but they must not run away with the idea that their film ivariably perfection. They have shown their hand. They would opolise the roll film industry if they could. It is the American cy all over. Let us trust that the Kodak Company will be taught esson which American manufacturers will take to heart.—I am, rs, &c.,

J. A. Reid.

PRINT WASHING.

To the Editors.

ENTLEMEN,—In your issue of the 10th inst., Doctor Dee refers to ion's sectional print-washer, and says (1) "When you take the its out they are all on the top of one another in various heaps"; "That they stuck print to print, or print to the tapes." Referring to No. 1, I fear Doctor Dee has let the water rush in anyhow n the top, instead of using a rubber pipe from tap to the con- ion on the print-washer; and if it were not that he refers to the pes," I should be inclined to fancy that he and I are not talking he same thing. My print-washer is described on pages 12 and 13 Marion's catalogue, and has taped metal frames hinged at the back, that the affair looks something like a large scrap-book. Mine is n. × 19 in., and I wash prints in it from 2 in. × 1½ in. up to n. × 18 in., and never find them displaced in the least. The great uble I have is that the syphon does not act as well as it did when chased, and even now, unless a great force of water is used, it s not refill. This means that the syphon runs the water away as t as it comes in, and the upper prints are not washed at all. ssrs. Marion had it to repair, but the fault still exists, so the top left open now. Referring to No. 2, if Messrs. Blank's paper is soft, the only way is to use alum or formalin after fixing, just a sh, then two or three minutes in the hardening bowl, which may be d several times, and then the usual washing. Caution, see all the m has dissolved; i.e., don't use too strong.—I am, yours, &c.,

May 11, 1901. Archer Clarke.

ANOTHER LENS ACCIDENT.

To the Editors.

Gentlemen,—Referring to Mr. Howard Barrett's accident to his s, or rather its extraordinary escape, in 1880 or 1881, when, in ajunction with Mr. G. E. Alder, I introduced the Luxograph, and d offices over Signor Lombardi's in Pall Mall East, I was photo- aphing from a parapet outside the studio (five stories high, I think), en my 15 × 12 landscape camera and Steinheil lens fell, or rather I shed it, over into the street. Singular to relate, a gust of wind rried it on to the top of the tarpaulin of a Pickford's van, and so tle was it damaged that the negative subsequently taken was being veloped within ten minutes of the accident, and it was perfect.— am, yours, &c.,

Archer Clarke.

May 28, 1901.

PORTRAIT CLUBS AND THEIR WORKING.

To the Editors.

Gentlemen,—Seeing a query in last week's British Journal of hotography as to the working of portrait clubs, it struck me that few hints on the subject might possibly be of use to more than the nerist. Agents may be obtained in plenty in some neighbourhoods, hile in others it is next to impossible to find one. The best localities r clubs are the poorer districts, where factories and large work- ops abound, and the most popular of all clubs is the half-crown one. f course, each individual photographer can please himself as to what e gives for the half-crown; the general run seems to be three cabinets, one cabinet and six cartes. The agent forming a half-crown club otains ten, twenty, or thirty members, paying him or her (more ten the latter) threepence per week each, and for each half-crown collected he or she receives a ticket or coupon entitling one member sit for the specified number of portraits at any time within three six months. At the expiration of the club, i.e., the tenth week, e agent receives usually a commission of 2s. 6d. cash for each ten embers. Some photographers pay more, and it is usually found that agent who once starts a portrait club goes on for months and years rming others, and in many cases spends the whole of his com- mission in photographs of himself. The order of sitting is usually settled among the members by a draw the first week, though sometimes a right to sit at once is exchanged for a later one for a small consideration in much the same way as an allotment in a building society. The writer knows one neighbourhood where three photographers have about six hundred of these clubs constantly going, and another where five shilling clubs are almost as popular. The clubs in this case still consist of ten members, but the weekly subscription is sixpence. Six shilling clubs, with twelve members at sixpence, are also likely to catch on in some localities, but the old thirty shilling club, in which thirty members pay a shilling a week each, is very rarely workable with an agent. It is preferably worked through a canvasser, and then entails the employment of a collector as well, and as it is not, strictly speaking, a club, there can be no drawing for priority of sitting, so that it becomes necessary to take the sitter when ten shillings have been paid, and to deliver the pictures before the whole has been received, and then in cases of removal, loss of employment, &c., losses will inevitably occur. On the whole, this system is more workable in small or moderate sized towns, while the genuine club is better in the larger. The photographer starting a club business will find it advisable to make as few extra charges as possible, and to frame his club charges no higher and if possible a little lower than those charged to ordinary sitters, as he should remember that in no case is he giving credit, but, on the contrary, he mostly receives payment for his work weeks before the sitters are taken, and a certain percentage of club members never use their tickets at all.—I am, yours, &c.,

C. Brangwin Barnes.

21, Alloa-road, Deptford-park, S.E.

DISTEMPER PAINT FOR BACKGROUNDS.

To the Editors.

Gentlemen,—Referring to your reply to "Studio" in your issue of May 24, will you kindly permit us to remind you that we have during the past two years frequently advertised our "Kalko" in your pages. This paint is a distemper (made in five shades) put up in the form of a dry powder for the sake of portability. It requires only the addition of hot water to make it ready for use; if allowed to become quite cold, it works with remarkable smoothness. No sizing or other preparation of the material is necessary when using Kalko.—We are, yours, &c.,

The Vanguard Mfg. Co.

Maidenhead, May 27, 1901.

THE SALE OF POISONS.

To the Editors.

Gentlemen,—Since you recorded the fact that some dealers in photographic materials in Dublin were fined, under the Irish Poisons Act, for selling sulphocyanide of ammonium and oxalate of potash, I have heard queries put by English dealers as to whether they run any risk of selling these things in England? In a recent number of the "Pharmaceutical Journal" I notice the editor says, after commenting on what you have written with regard to the Dublin prosecutions, "The fact that mercuric chloride and potassium cyanide are about the only two poisons the photographer need experience any difficulty in obtaining, &c." From this it would seem, as the "Pharmaceutical Journal" is the official journal of the Pharmaceutical Society of England, that body have no intention of proceeding against any one here for selling sulphocyanide of ammonium. For the sale of oxalate of potash, it cannot, for the oxalates are not included in the English Act. Neither were they in the Irish Act of 1870, as you have already said, but they have been added since by an Order in Council in 1897, but that does not apply to England. With regard to the convictions in Dublin for selling sulphocyanide of ammonium, I for one regret the cases were not contested. The wording of the Irish Act in relation to the cyanides is identical with that in the English one, which is "cyanides of potassium and all metallic cyanides." Therefore, if it is illegal for any one but a pharmaceutical chemist to sell sulphocyanide of ammonium in Ireland, why is it not equally illegal in England? After all, does this salt come within the meaning of the Act either in England or Ireland? Can sulphocyanide of ammonium really be classed as a "metallic cyanide?"—I am, yours, &c.,

A Country Photographer.

May 26, 1901.

Photographs Registered:—

A. T. G. Fraser-Tytler, 34, Reigate-hill, Reigate. *Photograph of G. F. Watts, R.A.*

F. Preece, 24A, Commercial-street, Hereford. *Photograph of group of active service volunteers.*

J. A. Horsburgh, 4, W. Maitland-street, Edinburgh. *Photograph of the Rev. T. Kennedy, D.D.*

W. E. J. Church, 119, High Street W., Sunderland. *Photograph of A. McComb* & *Photograph of A. McAllister.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

A. GARLAND.—We know of no other paper than the one mentioned.

M. E. BENÉS (Smetanova Ulice, 2, Prague, Bohemia).—Messrs. Seaman & Sons, Chesterfield, or Mr. H. N. King, 4, Avenue-road Villas, Goldhawk-road, Shepherd's Bush, W., may be able to supply you with stereoscopic transparencies.

THE ARROW CAMERAS AND OUTFITS.—P. WRIGHT says: "Will you kindly let me know where I can procure (wholesale) the Arrow cameras and outfits, to retail 6*d.* each, or who are the makers?"—In reply: Will some reader oblige with the desired information?

FILM TROUBLE.—J. E. G. writes: "My daughter had a small Kodak given to her, and every now and then gets a negative like the enclosed—i.e., a circle of negative with clear film round it. Can you tell the cause? It is only occasionally that it occurs, and I confess I cannot understand it."—The film sent clearly shows that it has been exposed twice. The "clear film" shows an image of another subject.

COPYRIGHT QUESTIONS.—ANDREW PATERSON writes: "(1) A, a photographer, asks B, a soldier, to pose for him. B in the course of time receives six photos without ordering them or seeing a proof. Must B pay for the photos? (2) In the event of A sueing B, is it likely for B to be the successful one?"—In reply: Certainly not if he did not order them. They were doubtless given to him for his trouble of sitting to oblige the photographer. (2) Yes.

BOOK ON POSING.—W. W. S. writss: "Will you advise me which book to get on posing sitters only, or any published paper where I could get some idea of good positions?"—So far as we are aware there is no work now in print, devoted solely to posing of sitters. Burnet's "Practical Essays on Art" would no doubt prove useful to you. The best instruction you can get on the subject is by studying the works of the best painters and photographers.

TONING BROMIDE PRINTS.—"BROMIDE" writes: "Could you give me a reliable toning bath for sepia tones with bromide paper? I may say I have tried alum and hypo, but with only indifferent results."—The hypo and alum method is reliable, and you ought to succeed with that. Did you use the solution hot? Another way of getting sepia tones is by the usual method of uranium toning, but the results by that are possibly less stable than by the method you have tried.

BUBBLES.—E. R. P. writes: "How can I prevent bubbles, causing transparent spots on the resulting negative, forming on the plate during development. The plates are first soaked in water and thoroughly brushed at commencement of development?"—If the bubbles are removed they cannot form the transparent spots. See that they are removed. But why wet the plates before the development? If you pour the developer over the dry plate the bubbles are easily removed, if any are formed.

IMPURE WATER.—"SPOTS" writes: "I have suspicions of the water I use being contaminated with iron, and causing spots on prints. Can you give me a test for same, or the address of an analyst who would give the desired information?"—If the spots are caused by particles of iron in the water it is probable that if some of it were allowed to stand in a glass vessel for a day or so they would settle to the bottom, where they could be seen as a red deposit. The County Analyst of your district would doubtless test the water for you.

DISCOLOURED PRINTS.—P. B. ABERY writes: "Would you kindly state what you consider the cause of the discolouration of enclosed prints? The agent through whom I bought the mounts blames the washing of prints, but as the only prints that go such a dreadful colour after exposing in show-case are prints on this sort of mount, I would rather have your decision as to which you consider at fault."—There is very little doubt that the cause of the stains is that the prints were imperfectly fixed and washed. We should decidedly say that the stains are not due to the mounts.

INDIARUBBER STAMPS.—A. B. writes: "(1) Will you kindly inform me of the process to make rubber stamps by photography; (2) and any other process which I can make direct in relief, so that it would be possible to take just a few prints off in ink, miniature size, for which I shall be much obliged?"—(1) The best way will be to make, or get made, if you are unable to do it yourself, a process block, and then get a rubber stamp made from that. The Nameit Company, 44, Snow-hill, E.C., will make the rubber stamp. (2) Only by such processes as process blocks, collotype, photogravure, &c.

BLUE PRINTING, &C.—F. W. DONISTHORPE asks: "Could you tell me in your next issue what the sensitised papers, which turn blue when exposed, are made of, and also those which turn red; and also whether there are any plates made that are any colour but black and white when exposed?"—A series of articles, with formulæ, on the iron processes by which prints of different colours can be produced, appeared in our volume for 1899; see pages 294, 312, 327, 345, 362, to which we refer you. But we do not know of a paper that will give a *red* print direct. We do not know of any plates that will give negatives except of the usual colour.

A. B. C.—Better take the advice of the civil and military authorities, a wait till the conclusion of the war before venturing to start a busine in South Africa.

COPYRIGHT QUESTIONS.—S. J. writes: "I have some photographs of the Ki which were published by the Rotary Photo Co., Ltd., London, E.(and am desirous of copying and selling them if they are not copyrigl Could you tell me if they are copyright or not; and if you cannot, can y say where or how I can get to know if they are copyright, and if it w cost anything? I have got an order for some, if I can do them witho fear of any trouble."—We have no idea whatever as to whether t photographs are copyright or not. The only way of ascertaining is b searching the register at Stationers' Hall, E.C. The cost will be nothir beyond the trouble of making the search.

VALUE OF AN ENGRAVING.—"KENT" writes: "I have an old engravin "The Death of Lady Jane Grey," by Valentine Green, dedicated Her Royal Highness, Charlotte Augusta Matilda, Princess Royal Great Britain, published Aug. the 1st, 1786. Plate 8. Could you gi any idea of the value of the engraving? The size is 18½ inches b 23 inches. It is in a good state of preservation."—We can give no ide whatever as to its value, as that must depend upon the quality of th impression. We should say that it has little commercial value, b you had better submit it to a picture dealer, who will value it for yo It does not follow that because an engraving is old that it is valuable.

SODIUM SOLUTIONS IN HOT WEATHER.—"SODIUM" writes: "Hot weathe is coming round again, and that means that certain crystals, such a sulphite of soda and carbonate of sodium, will be reduced into a liqui state, so that I would be at my wits' end to measure them out fo developing, &c. Please advise me what to do, then. Would it be bette to dissolve them into a nearly saturated solution, then measure out a desired? Does sulphite of soda solution decompose if kept long Thanking you in anticipation of your reply."—The sulphite solutio will keep good for a long time if the bottles are kept corked. Surel you do not find that any summer heat will liquefy either the crystals o sulphite of soda or those of the carbonate?

INTERIOR PHOTOGRAPHY.—M. L. writes: "I wish to take a photograph i a room, and shall be much obliged if you can tell me what ex posure I ought to give, what stops, and if the plates should b just ordinary—rapid or extra rapid? The room would be a pretty light one, and I am taking the photograph for the purpose o painting a picture from it, so that the subject would be pretty much face to face with the light. I shall be much obliged if you can answer me in your paper as soon as possible, as the picture ha to be painted by a certain time."—In reply: This is a question i is impossible to answer, as all will depend upon the light at the time, and the distance the sitter is placed from the window. "A pretty good light" is a very vague term. We should, however, recommend you to use rapid plates, and the largest stop in the lens that will give the desired definition. Also to make one or two trials, so as to arrive at the correct exposure. This is the most serviceable advice we can give.

LENS QUERY.—"ROSS-GOERZ" writes: "I would be glad of your advice in the difficulty of choosing a lens that would be suitable for portraits, groups, and general work, over whole-plate size, in and out of the studio. The following are what I marked out, but, not having any experience with any but the Goerz, seek your ripened judgment. I have marked them from 1 to 4. No. 1. Ross-Goerz, series III., No. 6, 12 in. focus; No. 2, Ross-Zeiss anastigmat, series IIa., No. 6, 11½ in. focus; No. 3, Voigtlander Collinear, series II., No. 6, 11 seven-eight focus; No. 4. Voigtlander Collinear, series III., No. 6, 11 seven-eighth focus. I know that in many of these lenses the back combination can be used at about double the focal length given. I would like to know if No. 2 can be so used, and which of the numbers you think most suitable for the purposes named?"—In reply: All the lenses named are excellent ones for the purpose, but there is some little difference in their rapidity when worked with their full apertures. Their rapidities stand thus—No. 3 quickest, next No. 1, then No. 4, and last No. 2 The compounds all may be used as single lenses.

STARTING A BUSINESS.—"HUMANUM" writes: "I am starting business with a somewhat limited capital, and wish to dispose of same to best advantage. (1) Would it be advisable to have a 15 by 12 camera and lens for all studio work, as I cannot afford both cab. and larger? (2) If so, would a 15 by 12 lens do just as well for cabinet heads as for 15 by 12? (3) Also what lens could I buy secondhand for a studio, say thirty feet in length (the best), and if very expensive, a good substitute? (4) Also, I should have a 15 by 12 camera, outdoor, to do all work excepting half-plate. What lens will give me the best all round result for groups, interiors, architecture, &c.? I wish to do a high-class business, and, when possible, to increase my apparatus, but at present I must spend my money in the best possible way. At the same time, I do not wish to have cheap lenses, I want the best result a lens can give. When answering above kindly state fully the name of maker and the style of lens. (5) Should the 15 by 12 in. camera and lens be too expensive, could I, say have a whole-plate for studio, and a 15 by 12 in. that would work outdoor and in studio?"—In reply: (1) Yes, if you wish to take 15 by 12 pictures. (2) Yes, if the studio is long enough to permit its use. (3) The most useful lens for cabinet pictures would be a cabinet lens of about twelve inches focus. These are to be met with secondhand. (4) A lens of the R.R. type, about twenty inches focus, unless you can afford one of the new anastigmats. We do not recommend any particular makers, as that is quite against our rule. (5) Yes.

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EX CATHEDRÂ.

ents 900. The report of the Comptroller of Patents for last year contains some points of interest. It ws that although the numbers of applications for patents e been steadily falling off since 1897, when y were nearly thirty-one thousand, till last r, when they were not quite twenty-four usand, the amounts of renewal fees received, vever, were considerably more. When the price for the ewal, or keeping up of patents, was reduced some eight rs ago, it was apprehended that the income of the Patent ice would suffer considerably, but the report just issued ws that it has not, but, on the contrary, has increased. 1893, when the present scale came into operation, the ewal fees came to about eighty-eight thousand pounds. st year they amounted to over one hundred and thirty-four usand pounds. From this it will be seen that although applications for patents have fallen off considerably, numbers of patents and "kept alives" have increased nsiderably. That is probably due to the smaller fees that are now required after the first four years to retain the patent in force. Some photographic patentees have thought, under the old rules, that their inventions were not, after the first four years, worth renewing at the rate of ten pounds a year for the next four years. But with the fees as they now are of five, six, seven, and eight pounds, respectively, the case is different, and to this, no doubt, is due the increase in the number of renewal fees paid. Our weekly list of applications for patents in connexion with photography seems to show no falling off. They appear to be as numerous as ever. But whether they are completed or not is quite another matter. It may also be interesting to mention that while the fees received in connexion with patents show a considerable increase, those received in connexion with designs and trade marks show a marked falling off.

* * *

Kew Church and Photography. We learn that it is proposed to enlarge the little church at Kew, which has been so closely associated with the House of Hanover. Vestries are to be added, and the old-fashioned pillared portico, with its curiously unecclesiastical appearance, is to be "renovated." It is to be hoped that what is to be done at this little old church will not interfere with its original and quaint design. Anyhow, photographers who desire to obtain pictures of it should secure them before the renovation and alterations are commenced. Kew Church has something of interest to photographers beyond its being a church which has always been associated with members of the Royal Family, and the burial place of Gainsborough and Zoffany, inasmuch as it formed the subject of one of the first, if not the first, camera pictures taken, which is, we believe, still in existence. It is a bitumen picture on a metal plate, and was taken by Nicéphore Niepce, about 1827, about a dozen years before either Daguerre's or Fox-Talbot's process was published. Just over Kew Bridge, or what used to be Kew Bridge, is Strand-on-the-Green, which it is proposed to modernise on account of its alleged present insanitary condition; so that photographers from London, or more distant parts, bent on securing photographs of Kew Church before it is altered from its present state, will do well to cross the

river and give some attention to Strand-on-the-Green. This place, at present, retains very much the appearance of a sleepy Dutch quay. We have before now called attention to Strand-on-the-Green, and the happy hunting ground it is for photographers and artists. This is proved by the number of cameras and easels to be seen there on a fine summer day, and often on winter days.

* * *

The Advance of Photography as an Industry. A very interesting side light is thrown upon the art of photography by a writer in the "Photographische Chronik," who shows from official statistics the rapid advance it has made in Germany as an industry during the period of 1875 to 1895. Similar statistics for this country would, perhaps, be more surprising still. In 1875 there were 2506 establishments in Germany, based exclusively upon photography, and they gave employment to 4674 persons. In 1895 these figures had grown to 4589 establishments giving employment to 11,901 persons, and the following classification may be made:—

2108	businesses	employing			2108	persons.
91	,	with motors employing			91	,,
977	,,	each employing	2	persons	1954	,,
1031	,,	,,	3 to 5	,,	3747	,,
295	,,	,,	6 ,, 10	,,	2171	,,
60	,,	,,	11 ,, 20	,,	824	,,
22	,,	,,	21 ,, 50	,,	621	,,
4	,,	,,	51 ,, 100	,,	275	,,
1	,,	.....			110	,,

These figures include photo-mechanical workers. In Germany, as in this country, the population is attracted to the large towns, and we find that Berlin takes the lead in this growth of photography, as shown by the following table:—

Number of Persons Engaged in Photographic Work.

Year.	In Berlin			In all Germany.		
	Male.	Female.	Total.	Male.	Female.	Total.
1875	342	39	372	4229	445	4674
1882	514	89	603	5681	610	6291
1895	956	191	1147	10412	1489	11,901

These figures disclose an important fact to which the "Chronik" does not give special attention. We refer to the relatively larger number of women employed in 1895 as compared with 1875, and more especially in Berlin. It would be interesting to trace this fact to its causes. In 1875 the percentage of women was 9.52 for all Germany, whilst in 1895 it was 12.51. But in Berlin the percentage had grown from 10.48 in the year 1875, to 16.65 in 1895. Is the struggle for existence in Berlin keener than it was, or are the conditions more favourable to the employment of women in photography?

* * *

A Stereoscopic Magnifier. The optician, Karl Fritsch, of Vienna, has taken out a patent for a magnifier of rather novel construction, giving a stereoscopic image. At the same time it relieves the strain upon the eyes, which the constant use of a monocular magnifier entails in the preparation of microscopic slides, engraving, etc. Two pairs of prisms suitably arranged convey the image by total reflection to the eye-pieces. The magnifiers are cemented to the lower surfaces of two of the prisms. These are situate centrally, side by side, and inclined so that their axes converge to the focal point. The other two prisms are at sufficient distance on either side to convey the image to the two eyes of the observer. Adjustments are provided for regulation of the distance of separation between the eye-pieces and also for focussing. The angle of convergence of the axes of the two lenses is approximately 17 degrees, which corresponds with the convergence of the axes of the eyes for a normal separation of 65 mm. Illustrations and further particulars are given in the "Central-Zeitung für Optik und Mechanik."

* * *

Professional and Amateur. There is not the least doubt that relations between professional and amateur in this country are on a much higher level than in Germany. We recently saw a reference to the fact in the "Photographische Wochenblatt," mentioning the friendly terms upon which both classes meet and discuss subjects of interest at our leading photographic societies. In Germany the feeling of the less fortunate professional against the amateur is frequently very bitter, partly by reason of greater want of regard by amateurs of the conventionalities of trade. An article by Dr. Miethe on questions of the day in the "Atelier des Photographen," clearly indicates the feeling. Being in a small town he took the opportunity to visit a photographer, whose work showed great technical excellence, but an utter want of artistic quality. The conversation drifted to business matters, and the professional unburdened himself of his grievances against the small band of amateurs in the town. Asked for his remedy, he seriously recommended that a yearly tax of fifty shillings be placed upon every camera. The doctor saw the uselessness of then urging the many cogent objections to such a remedy, but in his article he points out how important it is, that the professional should constantly endeavour to improve not only the technical, but the artistic quality of his work, so that the most ignorant may see at a glance, that it is far better than that of the dilettante of the small town, or of any other competitor. Perhaps the cultivation of artistic feeling may bring with it more genial regard for fellow-workers.

* * *

Science and the Eiffel Tower. A small book has recently been published by M. Eiffel, giving some account of the value of the tower bearing his name, from the scientific aspect. We gather the following particulars from "Central Zeitung für Optik und Mechanik." The top of the tower commands a view over an area of sixty to eighty kilometres diameter. This is not without importance in military defence. It is found, however, that the summit is swayed considerably by the wind in an ellipse, and that the action of the sun's heat upon the iron work also imparts a motion of a rotary character to it. For these reasons astronomers have not been able to avail themselves much of M. Eiffel's invitation to use the tower for observation. The meteoric showers, however, were watched from it, as the atmosphere on the third story was clear, although thick below. M. Janssen, the astronomer, has examined the spectrum of one of the large electric search-lights from the

ce of the Meudon Observatory, which is seven kilo-
es distant, and has found that it has to traverse the
amount of oxygen as the rays of the sun in reaching
arth. By using a more powerful light he hopes to es-
sh the fact that the sun is devoid of oxygen. The head
ie Meteorological Department, Professor Mascart, has
olished a laboratory on the top of the tower, and the
rvations are telegraphed thence to the central bureau,
have been found of great service. Probably the muni-
weather bureau will be transferred to the Eiffel Tower
n it becomes the property of the city in 1909, and its
ulness may then be extended. The tower is an ideal
e from which to study aerial navigation. On June 6,
), signals were read from a balloon, which had nearly
hed the German frontier. Experiments in wireless
graphy have been made, and in November last, Colonel
raud tried a powerful phonograph on the tower, the
ds being distinctly heard on the other side of the Pont
ena, against a storm. An apparatus has recently been
p to collect and measure electric currents in the vicinity,
shocks of 10,000 volts have been observed. It seems
in the realm of possibility that a method of storage
ht be devised and the tower might then take its place
distributor of electric power. Reference is also made
he important investigations concerning the resistance
he atmosphere and gas pressure which have been made
prominent physicists.

* * *

New Comet. As far as we can learn only one observer has so far reported a glimpse of the comet in this
ntry, but it should be now visible after sunset, but much
bright than when seen from the Cape of Good Hope
al Observatory. Sir David Gill reports that on May
he comet's action had become north-easterly in direc-
. It was circular in shape, and had a tail over two de-
s in length, the nucleus being well defined. The in-
sting visitant appears to be moving towards the north-
ern part of the well-known constellation Orion. As it
passed its perihelion before it was discovered, it is evi-
t that there will not be much beyond telescopic photo-
phy in the shape of records.

* * *

evolution n Storage teries. It is reported that Mr.Edison is busily engaged in incorporating a company to bring out a new light-weight storage battery.
. Edison is stated to have said that this will re-
utionise electric propulsion, put an end to steam
gasoline motors, and prove the biggest money-
ker he has yet invented. It is obvious that if
will do all this it would be available for the
duction of electricity, already largely employed for
ting. But for studio work the difficulty lies in the re-
rging the accumulator when there is no current on the
mises. A set of accumulators to be of practical use for
ctric light in the studio would weigh some hundred-
ight, and as the carriage of such huge pieces of ap-
atus would be so difficult and costly, there is always the
dency to run them down to the lowest potential, and
re is always danger of injuring the battery, which
a kind of white elephant if only of occasional use, as an
umulator rapidly spoils if not kept charged. Most of these difficulties would be removed if the new battery prove to be so light, that it can be transported from studio to electric works without trouble.

* * *

New Mode of Foretelling Weather. A German physicist has described a new method of weather forecasting, which he discovered by accident, and has proved to be trustworthy. As he was waiting at a country railway station he noticed a shrill sound made by the wind blowing through the telegraph wires. Most of us have heard such a sound and attached no importance to it; but this observer remembered that he had heard a similar sound either immediately before or after a storm, or a heavy fall of snow or rain, and it occurred to him to try to ascertain if there was any connexion between the phenomena. After hearing the sound on this particular occasion he noted a heavy shower of rain within a couple of days. He then set to work to thoroughly investigate the matter. He now states that any unusual disturbance in the telegraph wires is an infallible indicator of bad weather, and, second, that the nature of the changes in the atmosphere may be learnt from the sound which the wind makes in passing through the wires. Thus, a deep sound of considerable or medium strength indicates that there will be slight showers of rain, with moderate winds, within from thirty-six to forty-eight hours, and, on the other hand, a sharp shrill sound is a sure token of a heavy storm, which will be accompanied by much rain or snow. We may note that the intensity of the sound made by the wind on the telegraph wires is much increased, and the quality of its timbre more readily appreciated if one end of a stick, such as a strong walking-stick, be pressed against a telegraph post and the other end be placed between the teeth. It will be rather amusing if, whenever a photographer wishes to ascertain if he is likely to have fine weather for a proposed photographic expedition, he sends the boy round the corner to listen at a telegraph pole—What are the wild winds saying?

* * *

A Remarkable Dispersive Agent. At a meeting of the Chemical Society on May 15, Mr. H. J. Maxim read a paper on some physical characteristics of a chemical known as Piperine. This chemical is generally seen in the crystalline form, but has been obtained as a solid by melting it at 135° C., and allowing it to solidify. But hitherto this amorphous form has not been permanent. After the lapse of a few months it reverted to the original crystalline form, and if heated to 100° the reversion was sudden and complete. But by keeping the melted piperine for an hour at 180° the resulting product is much more stable, at any rate it has kept unchanged for two years and a half. These details would, of themselves, be of no interest to the photographer; the important point Mr. Maxim has noted is that this resin-like piperine is very highly refractive, and has a dispersion quite extraordinary, the visual spectrum being four times as long as that given by a dense flint-glass prism having the same refracting angle. The co-efficient of dispersion is double that of carbon disulphide. There would appear here to be possibilities in connexion with lens making—as a thin film, say in lieu of Canada balsam, would act as well as a thick one—in view of the remarkable and unprecedented dispersive power of this new form of piperine.

THE COMMON ENEMY.

For several weeks past the weather has been such as to make the above title a very suitable one for present discussion, but a change has taken place which should be beneficial all round. The intense dryness of everything produced such a condition that dust particles assumed the proportions almost of a photographic plague: we have seen more negatives covered with pin-holes the last few weeks than ever we remember during a similar period, and a few hints bearing on the subject will not be out of place now the season is well opening out. While we are complaining of the effects of dust, we may take the opportunity to point out that it is quite possible to overdo arrangements for getting rid of its effects upon a negative. In wet collodion work, of which the present generation of photographers know so little, one dust particle often means a mark from that particle for perhaps the whole length of the plate: in dry-plate work it simply means a screening of the action of light immediately beneath the atom of dust—result, a "pin-hole." Lately made negatives, as we have said, are very full of these evidences of abnormal conditions: but as to whether they are any disadvantage to a print depends upon their size and their locality. Among trees and broken scenery a pin-hole must be very large indeed to be visible in the print. In a light sky with clouds, it is only the smaller pin-holes that may be ignored: but there is a remarkable point we have to consider. By the action of "irradiation" on the eye, light spots upon a dark ground appear larger than their true proportions, while dark spots upon a light ground appear smaller. The result is that a pin-hole fairly conspicuous on the negative is virtually invisible in the print from it. Hence we may point out that hours of labour spent upon touching out pin-holes in negatives are frequently so much time lost. The best plan with a pin-holey negative is first to take a rough print from it on a piece of waste paper: the spots that will require touching out are sufficiently few as to surprise those who attempt this scrutiny for the first time. There is a further disadvantage attendant upon over-spotting-out. By virtue of the irradiation referred to, if the pigment used for spotting in the slightest degree encroaches beyond the boundaries of the pin-hole it will show very conspicuously, and appear larger than it is.

We would not wish to be considered as palliating such an untidy mode of working as to permit of many pin-holes: we merely desire to point out that once there their evil effects are less in practice than would appear probable. Besides, there are pin-holes which will make their appearance without dust—for example, in intensifying with mercury bichloride and ammonia, they will make their appearance in a manner as mysterious as alarming; but as we are now referring to dust only we will not pursue this aspect of the matter further. What should now be considered is what precautions to take to avoid any effects of a deleterious nature brought about by dust. First and foremost is a general overhauling of both camera and slides: it has often struck us when watching other workers what dusty cameras they use: it would seem almost as though they deemed it a sin to wipe out the interior of their camera, yet it is an almost imperative necessity; a damp cloth will take away all harmful dust if the bellows be extended to their fullest extent so as to allow of their thorough cleansing. Then the dark slides should be seen to: a photographer of our acquaintance makes a point every spring of taking the shutters entirely and dusting out the grooves they w in with a stiff hog-hair brush, such as artists use; we c sider this labour well spent.

Then, again, the plates themselves require attention. sent out by the makers they are usually dust-free, but always, and we know one worker who dusts every pl with a broad camel-hair brush before he places them the dark slide. With the majority of plates we think t a needless refinement of carefulness; but when they backed with a medium which dries quite free from dar ness, it is a very necessary precaution, and indeed, we th it most desirable that all backed plates should be most ca fully examined in this direction. We have referred to use of a broad camel-hair brush—the kind used for copy books is very suitable—but it is not the only method to employed. There is on the market an excellent dus made for the purpose, suggestive of the old "Buckle brus It consists of a piece of plush doubled with a plush surf outside, and fastened into a flat wood handle. If k clean always, it is perhaps better than anything else- silk handkerchief should not be used, it is apt to produce electrical irritation of the surface which attracts dust, a which does not fly off as might be expected when it becon oppositely charged. Finally, we may refer to the absol necessity for freedom from dust on a negative to be v nished. A dust particle which does not get washed aw with the flow of the liquid becomes a nucleus for a mu larger spot in the varnished surface. We strongly reco mend the use of the plush duster for this purpose, a would conclude by saying that the careful worker will every effort to get rid of dust in any and every spot in paratus and chemicals.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATI

[The following is the text of the Appeal that was recen addressed to the whole of the Professional Photographers of Gr Britain and Ireland to join the newly formed Professional Associati We have already printed the Rules in the Journal of March 2 the annexed appeal is reproduced for the information of any of readers whom it may not have reached.—Eds. *B.J.P.*]

There are few professions, trades, or industries that nowadays not possess Associations whose duty it is to guard and promote interests of their members. Professional photography has hith been an exception. The result of this deficiency has been that wh concerted action has seemed desirable there has been no representat organization to take the initiative. Within the last two mont however, an urgent call has been made in the pages of the press the immediate formation of a Professional Photographers' Associati That demand, voiced by hundreds of photographers in all parts Great Britain and Ireland, has been answered. The Association n exists.

The object of this appeal is to invite every professional phot grapher to join the Association.

The principal objects of the Association are:—(1) To wat Parliamentary and public action affecting the interest of profession photographers. (2) To consider the Factory Act in its influence photographic labour. (3) To secure uniform and equitable terms Fire Insurance. (4) To maintain the photographer's right to t negative. (5) To regulate the Apprenticeship system. (6) suppress price-cutting. (7) To protect photographers in the sale poisons. (8) To regulate manufacturers' discounts, &c., &c.

Such, in addition to those stated in the rules, are only a few the many objects that may be dealt with by the Profession Photographers' Association.

ın it be denied that such an Association, long desired and now ed, should claim as a right the active support of every one ested in the welfare of his profession and desirous of raising its is? The answer to this appeal will have a vast influence on the re of British professional photography. If, as the Committee dently hope, the responses are numbered by thousands, a new er in the photographic world will exist, to be wielded on behalf ıose who constitute the very life's blood of photography: the essional men and women. The Committee, therefore, most estly appeal to their brethren to accept this opportunity of ing the Association numerically strong—for its strength will lie umbers as well as in the justice of the cause it is created to apion.

ıe subscription has been fixed at the low sum of five shillings s to place membership within the reach of all; but this does not lude donations to the funds.

ıe Committee has under consideration the scheme suggested at the ting at Anderton's Hotel, on March 28, for the organization of vincial Centres; but before the matter can be outlined the onses to this appeal must be in hand.

he Provisional Committee exists for a period of three months only: Permanent Executive will be elected at the first General Meeting he Association, to be held on July 2 next, in London, as vided by the Rules.

form of application for membership was enclosed with the above al, which is signed on behalf of the Provisional Committee by Alfred Ellis, Honorary Secretary, 51, Baker-street, London, W.

First List of Members of the Association.

y the courtesy of Mr. Alfred Ellis, the Honorary Secretary, we nd the first list of members of the Association. The circular was out a day or two before the commencement of the Whitsuntide days—not perhaps the most favourable time of year for the issue uch an appeal; and yet within three or four days a sum of over had been received in subscriptions and donations from the owing subscribing members:—

aham, George Perry, Keswick, Cumberland.
lerson, William Blair, Photographer, 154, Union-street, Aberdeen.
lerson, William, 364, Hamilton-place, Partick, Glasgow.
old, Richard George, Stafford-street, Market Drayton.
ward, Henry Augustus, 17, Wote-street, Basingstoke, Hants.
nett, H. W., Hyde Park-corner, S.W.
kett, R., 6, The Grove, Hackney.
ige, F. A., 55, Dalston-lane, N.E.
wn, George Arbuckle, 2, Grey-place, Greenock, Scotland.
lock, Ezra (Bullock Bros.), 2 Hibel-road, Macclesfield.
nett, T. & Sons, 8, Broad-street, Worcester.
ns, Thomas, Photographer, 5, West Maitland-street, Edinburgh.
l, R. & Son, Catherine-hill-house, Frome.
lby, Frederick William, 116, Parade, Leamington Spa.
lman, James, 79, Lowther-street, Whitehaven.
mmell, George Angwin Dangar, Castle Studio, Church-street, Launceston, Cornwall.
ıd, William, Photographer, 63, Magdalen-street, Norwich.
wn, William, Photo. Artist, 9, Gilmour-street, Paisley.
raud, Francis (Mayall & Co., Ltd.), 126 Piccadilly, W.
rkle, Percy Joseph, 20, Commercial-street, Aberdale, South Wales.
tles, T., F.R.P.S., Legh House, Warrington.
ns, George, Manager (Thomas Burns), 5, West Maitland-street, Edinburgh.
are, G. R., 97, Lower Clapton-road.
pperton, John W., Photographer, 23, Albert-place, Abbotsford-road, Galashiels.
rk, Frank William, 284, Romford-road, Forest Gate, E.
per, Henry Montague, 29, East-street, Taunton.
ak, Reginald Boyce, The Studio, Victoria-road, Diss, Norfolk.
lis, Henry Beauchamp, Westgate Studio, Canterbury.
ledge, Thomas, Photographer, The Studio, Innerleithen.
p, Fred, 258, Brixton-hill, S.W.
ooke, William, 103, Princes-street, Edinburgh.
Chambers, Frederick, 264, Ashton New-road, Beswick, Manchester.
Clark, John Edwin, 15, Market-place, Gainsborough.
Carr, Albert Bradley, Royal-street, Barnsley, Yorks.
Clark, Arthur Bennett, 74, Darlington-street, Wolverhampton.
Dalby, H. J., 82, Wellington-street, Woolwich.
Done, J., Barnet.
Dixon, Thomas James (Henry Dixon & Son), 112, Albany-street, N.W.
Dale, John William, Wellington House Studio, York-road, West Hartlepool.
Daniells, Arthur Joseph (A. V. Daniells & Co.), 38, Tachbrook-street, S.W.
Devereux, Frederick Oakes, 98, Western-road, Hove.
Dowden, Harry, Parkside Studio, 216, Stanley-road, Bootle, Liverpool.
Debenham & Co., 5, Clifford-street, York.
Diston, Mary Anne (Adam Diston & Son), Talbot Studio, Leven, Fifeshire.
Davey, Walter & Son, 26, James-street, Harrogate.
Ellis, Alfred, 51, Baker-street, W.
Ellis & Co., 18, High-street, Sutton.
Everitt, Charles Frank, Cradley-road, Cradley-heath, (S. O.), Staffs.
Elliott, J. J. (Elliott & Fry), 55, Baker-street, W.
Elliott, Ernest C. J. (Elliott & Fry), 55, Baker-street, W.
Emeny, Charles John, Walton, near Ipswich.
Eccles, Edmund (E. Eccles & Sons), 15, Broad-street, Bury, Lancs.
Fletcher, Charles Henry (Fletcher Bros.), 212, Wheeler-street, Lozells, Birmingham.
Fox, Thomas (Fox & Hill), 23, Crouch-hill, N.
Fry, Samuel Herbert, 12, South-villas, Camden-square, N.W.
Forrest, Albert Owen (T. Forrest & Sons), Cambrian Studio, Pontypridd, South Wales.
Fall, Thomas, 9 & 10, Baker-street, W.
Green, N. (Elliot & Green), 41, St. John's-hill, Clapham Junction.
Grove, William, 63, Baker-street, W.
Green, W. (Dowdall & Green), King William-street, E.C.
Griffiths, Alfred John, High-street, Honiton, Devon.
Gibson, George Wright, Photographer, Coldstream, N.B.
Gyde, Edwin Richard, 22 and 24, Pier-street, Aberystwith.
Giles, Henry, Photographer, 124, Lammas-street, Carmarthen, S. Wales.
Gigg, Frederick George, 18, High-street, Evesham.
Gover, Herbert J. & Co., 53, Piccadilly, Hanley, Staffs.
Goldie, Archibald, Photographer, F.R.P.S., 95, Mansel-street, Swansea.
Gillman & Co., Limited, Photographers and Printsellers, 107, St. Aldates, Oxford.
Greenwood, Arthur, 231, Blackburn-road, Accrington.
Greenway, S. H., 27, Abington-street, Northampton.
Goshawk, Walter James, The Studio, Peterborough-road, Harrow-on-the-Hill.
Hallier, H., High-street, Sydenham.
Hull, H. E., 136, Holland Park Avenue, W.
Hall, Henry, C. & J. Halle, 9, Westgate, Wakefield.
Hunter, Alexander, Photographer, Hunter & Sons, 6, Union-street, Oldham, Lancs.
Hatch, Mercer, 68, London-road, Bromley, Kent.
Hunter, Norman, The Studio, Barr's Brae, Port Glasgow.
Herbert, William John, Wallsend Studio, 147, High-street, Wallsend.
Hall, Harry, The Studio, Witham, Essex.
Hilder, John William, Matlock Bath, Derbyshire.
Howes, Harry, High-street, Irthlingborough.
Hadley, George (Hadley & Son), 36, Castle-hill, Lincoln.
Hester, Albert Howard, St. Kilda's Studio, Upper Clapton-road, N.E.
Horne, William Henry, 69, Derby-street, Leek.
Hunter, Thomas William, Messrs. Hunter, 23 and 25, Fore-street, Hexham.
Heawood, John William, 75, King Richard's-road, Leicester.
Heap, Thomas, Penfold Sowerby, Sowerby Bridge, Yorks.
Hewitt, Charles Henry, 9, Catherine-terrace, Gateshead-on-Tyne.
Hinchcliffe, Henry, 106, Cazeneau-street, Liverpool.
Johnson, Charles, High-street, Gillingham, Dorset.

Jordan & Metcalf, 16, George-street, St. Helens, Lancs.
Jenkins, Frederick, The Studio, High-street, Southwold, Suffolk.
Kirk, Saville, Skepton-road, Ilkley, Yorks.
Kempsell, Harry John, French & Co., 1, Railway-terrace. Wallington, Surrey.
Kelly, Edwin, Photographer, 26, Queen-street, Newton Abbot.
Lyn-, Percy, 6, Paragon-arcade, Hull.
Lacey, Seymour, Kent & Lacey. 104, Terminus-road, Eastbourne.
Mackie, Alexander, 89, Albany-street, N.W.
Morgan, G. W., 393, Union-street, and 5, Market-street, Aberdeen.
McLean, William, Hunstanton, Norfolk.
McNeille, Douglas, 20, Church-street, Stratford-on-Avon.
Murdoch, Robert George, 34, The Strand, Exmouth, Devon.
Marsh, William Pankhurst, Royal Marine Studio, Waterloo-square, Bognor.
Miller, Andrew, The Cumnock Studio, Barrhill-road, Cumnock.
McCann, Alfred, High-street, Uttoxeter, Staffs.
Macdonald, Walter, Managing Partner (Valentine & Co.), 4, High-street, Dundee.
Middleton, Edward McIntosh, 181, King-street, Aberdeen.
McGregor, Adam (A. McGregor & Sons), 46, King-street, Kilmarnock.
Mullins, Gustav (Hughes & Mullins), 60, Union-street, Ryde.
Moffat, Frank (John Moffat), 125, Princes-street, Edinburgh.
Millard, James & Co., 7, Market-street, Wigan.
Mowll, Alfred Frank (Mowll & Morrison), 45, Hardman-street, Liverpool.
Maclardy, John, Photographer, Church-street, Oswestry.
Messer, Horace Charles, 29, Castle-street, Salisbury, Wilts.
Midwinter, W. H. & Co., 48, Park-street, Bristol.
Martin, James & Co., Park-villas, New Southgate.
Mower, Thomas Henry (Mower & Co.), 39, Park-street, Bristol.
Newton, H. W., 19, Fife-road, Kingston.
Norris, Herbert, 18, Queen-street, Newton Abbot.
Osbourne, John, 15 and 58 Anlaby-road, Hull.
Parker, W. G., Holborn.
Pithie, James Taylor, Photographer, 115, Union-street, Aberdeen.
Parsons, William Augustus, The Studio, 3 The Downs, Altrincham, Cheshire.
Pratt, John & Co., City Buildings, Greenock, N. B.
Page, William, Moat Studio, East Grinstead.
Preston, Robert Hawkes, 40 Market-place, Penzance.
Pendry, George, 38 Long-row, Nottingham.
Plumbe, William, 78 High-street, Maidenhead, Berks.
Puddicombe, William Henry, Electric Studio, Bideford.
Parker, W. G., jnr., Holborn.
Prestwich, William Henry, Photographer, 744, High-road, Tottenham.
Priestley, Arthur (Priestley & Sons, Ltd.), Egremont, viâ Liverpool, and 60, Balls-road, Birkenhead.
Rae, Alexander & Son, Bridge-street, Banff, Scotland.
Russell, J., 17 Baker-street, W.
Rowe, Thomas, G. & R. Lavis, 71 Terminus-road, Eastbourne.
Rosemont, Josef, 6 Bond-street, Leeds.
Rigden, Hubert Jarvis, 105 Middleton-road, Bowes Park.
Reed, Henry Thomas, 443 West-strand, W.C.
Rodgers, William Macintosh, Crows & Rodgers, 57 Murray-place, Stirling.
Robinson, Ralph Winwood, H. P. Robinson & Son, Linkfield-corner, Reahill, and 147 High-street, Guildford.
Rewman, Jenny, Worthing Portrait Co., 4 Railway-approach, Worthing.
Rettie, R. G., Studio, 1 Townsend-place, Kirkcaldy.
Sims, Lang, Brixto -hill.
Spencer, Charles, Station-road, Dunbar, N. B.
Sheaff, Frank Charles, 28 Hartfield-road, Wimbledon.
Speight, Gulliver, The Square, Market Harborough.
Smith, George Comrie, The Studio, Giffnoch, near Glasgow.
Spark, John, 49 York-place, Perth, N. B.
Sheaf, Egbert Thomas, Manager Art Photo Co., 110 High-street, Newport, Isle of Wight.
Shaw, Walter, Camberley, Surrey.
Spalding, Fred, 4 High-street, Chelmsford.
Smith, John Caswall, The Gainsborough Studio, 305 Oxford-street,
Smith, Walter, Photo-Artist, 18 Station-street, and Priory Stud Spalding.
Squibbs, Abraham, Fore-street Studio, 38 Fore-street, Bridgwat Somerset.
Stuart, McDonald, William, The Studio, 7 South-bridge, Cup Fife.
Seaman, Dennis, B. & Co., 75 Lime-street, Liverpool.
Steven, Thomas, W. & Co., 3 James Morrison-street, Glasgow.
Smith, Harold, F., E. Pearce Smith, 46 Stamford-hill, W.
Spink, Henry Charles, 109, Western-road, Brighton.
Stringer, Gilbert, 7, Charles-street, Colchester.
Turner, T. C., 17, Upper-street, N.
Tyler, Edward Anthony, 10, Bridge-street, Stratford-upon-Avon.
Taylor, Alexander, Photographer, 49, Schovehill, Aberdeen.
Tassell. Frederick William, 8. Devonshire-street, Carlisle.
Thomas, David Griffith, Photographer, Central Arcade, Wrexham.
Tourtel, John William, Art Studio, Fowey.
Trevorrow, William, Photographer and Dealer, Tregenna-place, S Ives, Cornwall.
Urquhart, Frederick W., Harper's-court, Dingwall.
Vanderbilt, Thomas, Fine Art Studio, 10 James-street, Liverpool.
Valentine & Sons, Limited, 154 Perth-road, Dundee.
Vandyk, Carl, 125 Gloucester-road, Queen's Gate, S.W.
Vidler, Fred, William, The London Photographic Co., Limited, Baker-street, W.
Wright, W. E., 65, Woodgrange-road, Forest Gate.
Wallace, Thomas, Eskbank-road, Dalkeith, N.B.
Whitlock, Henry Joseph, 11, New-street, Birmingham.
Wright, William James, Grosvenor Electric and Daylight Studi Church-road, Upper Norwood.
Wood, Charles H., Fine Art Studio, 50, Bampton-street, Tiverto Devon.
Wright, Arthur, 54, Whitby-street, West Hartlepool.
Whitestock, William Joseph, Photographer, High-street, Uppingham
Watkin, Herbert, Grand Studio, Marine Parade, Scarborough.
Warwick, John & Co., 82B, Lowther-street, Carlisle.
Warsnop, John, Rothbury, Northumberland.
Warrington, John, 34A, Bold-street, Liverpool.
Webster, George W. (G. W. Webster & Son), 31, Bridge-street-row Chester.
Williams, John, Photographer, Portland Studio, 8, High-street Rhyl.
Whyte, James, Photographer, 37, Jamaica-street, Glasgow.
White, John & Son, Gresham House Studio, Beach-road, Little hampton.
Whitlock, Herbert Mason, 319, High-street, West Bromwich.
Yallop, Alfred William, Studio, Gorleston-on-Sea, Great Yarmouth

Nearly 4000 circulars were issued, so that the above responses though gratifying, leave a very large margin for new members. As we wrote a fortnight ago, "Membership, on the basis of the Rules, is open to ALL professional photographers, and if there are any of the latter who have not been addressed from the offices of the Honorary Secretary, Mr. Alfred Ellis, 51, Baker-street, London, W., will they be so good as to accept this present reference as an invitation to become members? It is the wish of the Provisional Executive to make the membership not merely large, but representative of the whole of the country. The more members and the wider the field they cover the lighter will be the task of the committee in working out the scheme of provincial centres. Now that the Association has been duly constituted, provided with rules, and has an executive which is prepared to carry out a District Centre scheme enabling photographers in all parts of the country to locally co-operate with the London centre of the Association, the membership applications should swell to thousands. The long-sought opportunity for British professional photographers to unite in self-defence, and for the safeguarding of their important interests is now before them, and it should be embraced by every man who has the welfare of his calling and his own individual advancement at heart."

NOTES ON CARBONA PAPER.

BE are few, I imagine, who have not heard of "Carbona" r, and, although it has been advertised for some time past, it not until quite recently that I gave it a first trial. Since then ve made a considerable number of experiments with it, with erent classes of negatives, under what I consider test conditions, have come to the conclusion that, in this paper, photographers, professional and amateur, have a valuable addition to the erous papers now on the market. From them, however, Carbona rs considerably. Perhaps a few notes on the subject from one who had a very long experience in every process of photographic ting may be of interest.

n the first place the name seemed to me, as an old carbon worker, e somewhat suggestive of a carbon process, but it is nothing of kind. It bears no more relation to that process than do the platino- t papers to the real platinotype process. It, like them, is a silver ess. The results, however, both in surface and the colours ainable very closely resemble veritable carbon pictures—the urs, however, being limited, from light sepia through the browns, urple and almost engraving blacks. It may at once be said that manufacturers of the paper, Messrs. J. J. Griffin & Sons, Limited, not wish it to be inferred that the papers have anything to do h the actual carbon process, the name being simply adopted reason of the similarity in appearance of the results by the processes.

he paper is a printing-out silver paper, though it is quite different n any that I have hitherto worked with. It tones more quickly, yields a greater variety of tones, and is more easily worked than ordinary "P.O.P.'s" It does not under any conditions yield double es, and it is very quick in printing. Carbona is sent out of two ds, matt and glossy. The former, as its name implies, has a matt face, though it is not an actually dead one, as the prints when shed have a surface very similar to that of a carbon print eloped on single transfer paper. The glossy has a slightly mauve t, but not the very high gloss of the usual run of gelatine P.O.P.'s. more closely resembles that of albumenised paper, while the tones ields are very similar to those on the albumen paper of old which used to sensitise for himself—namely from warm browns to p rich purple browns, or purple blacks which are still the envy many modern photographers, and which are quite unattainable on ordinary P.O.P.'s. To such as wish for this class of picture I uld commend glossy Carbona, with the assurance that they will e the means of producing what they desire.

n these notes I shall first deal with the matt paper. In printing takes a somewhat reddish tint, and has no great tendency to nze in the shadows, even with tolerably vigorous negatives. The nting, as with other papers, should be carried somewhat deeper n the finished print is intended to be. The deeper and blacker tones desired in the finished picture, the deeper must the printing carried. If deep black tones are wanted, the printing should be siderably more than if only light sepias are required. If the nts are to be toned in the platinum bath, the printing should be ried rather deeper than if the gold bath be used, as the prints uce more in the former than they do in the latter.

After printing the prints are washed in several changes of water remove the free silver, of which there seems to be a liberal antity. In washing the prints at this stage they should be kept ving about, and the water changed several times during the first v minutes, for, as with all emulsion papers, the quicker the major rtion of the free silver and other salts are got rid of the better. n to fifteen minutes is sufficient washing. The prints are then dy for toning.

The toning bath recommended by the makers of the paper is as llows:—

Stock Solutions.

No. 1.

Soda acetate.....	100 grains	or 14 grammes.
Borax	50 „	„ 7 „
Water	12 ounces	„ 750 c. c.

No. 2.

Gold chloride	15 grains	or 1 gramme.
Water	15 ounces	„ 440 c. c.

For warm to purple tones take 6 ounces (or 120 c. c.) No. 1, 1 ounce (or 20 c. c.) No. 2, and 5 ounces (or 100 c. c.) water.

For black tones take 6 ounces (or 120 c. c.) No. 1, 1 ounce (or 20 c. c.) No. 2, and 1 ounce (or 20 c. c.) water.

It will be noticed that the only difference in the formulæ for brown tones and for black ones is in the proportions of the water.

For the convenience of amateurs Messrs. Griffin supply the toning salts put up in small packets, each separate, which only require to be dissolved in water and mixed as required. With these the trouble of weighing out is saved. The price of them is 1*s.* 6*d.* for six, which make thirty-six ounces of toning bath.

In the little pamphlet enclosed with the paper, attention is called to the fact that the toning takes place very rapidly, and mentions that only two or three prints should be put into the bath at a time, and I would emphasise those directions. With the usual gelatine P.O.P.'s the colour is judged by transmitted light—looking *through* the print, but with Carbona it must be judged of by looking *on* the the picture. In toning, the prints must be removed from the bath while they are several shades lighter than those desired in the finished picture, for they darken considerably in the fixing solution, and dry up still darker. From this it will be seen that Carbona behaves very differently from ordinary gelatine papers, and unless this point is attended to, the results will be disappointing as regards colour when finished. For example, if a light sepia brown is desired, the print must be removed from the bath directly the slightest action appears to have set in on the lights; if rich sepia, as soon as the foxy red has gone; a dark sepia, when the print has acquired a light sepia colour. If a rich black is wanted, the print should be taken out as soon as all brown has disappeared. If the toning is carried farther than this a purple black, or a cold black, is the result.

The toning, as I have just mentioned, is very rapid. When the solution is, say, at a temperature of about 65° F. it will not take more than about half a minute for the lighter sepia tones, or more than a couple of minutes for the black ones.

After the prints are toned they should be washed for two or three minutes in running water; they are then fixed for ten minutes in the following solution:—

Soda hyposulphite	1 ounce.
Water	10 ounces.

Although the instructions say ten minutes, I prefer to allow a little longer than that. The prints are then washed in the usual way to remove the hypo.

The matt paper can also be toned with platinum, and with this it yields a black colour not unlike platinotype. The formula issued with the paper is as under:—

Stock Solution.

Potassium chloroplatinite....	15 grains or 1 gramme.
Water	3½ ounces „ 100 c. c.

For use take—

Stock solution	5½ drachms or 20 c. c.
Critic acid	80 grains „ 5 grammes.
Water up to	10 ounces „ 284 c. c.

As the prints tone very rapidly they should be inserted in the bath one at a time while the bath is new.

For my own part, I do not think there is any advantage whatever in the platinum bath, even with the matt paper, as the same tones, and I fancy more pleasing ones, may be got with the gold bath, and with the whites more "pearly." The platinum bath, in my hands at least, has not proved well suited for the glossy Carbona paper, as I have failed to get what to my mind are satisfactory results; but possibly that has been my fault.

Both the Carbona papers, like all other papers, can be toned in the "combined bath," and a formula for one is given in the directions issued with the paper; but as I am one of those who are strongly opposed to its use, on the score of the doubtful stability of the results

it yields, I shall not quote it. The formula given is, however, less objectionable than some that have been published, inasmuch as it contains neither acid nor lead.

I will now say a few words with reference to the glossy Carbona, which, as I have previously mentioned, very closely resembles, alike in surface and in the results it yields, the albumen paper of old. With the acetate and borax bath, according to the formula above quoted, all tones may be obtained from the bright red-brown, which has often been described as the Payne-Jennings brown, to a deep rich purple-brown, or a purple-black—colours that are not obtainable on the ordinary gelatine P.O.P.'s, even if vigorous negatives be employed. Indeed, such tones may be got as are only obtainable on albumenised paper when sensitised at home on a strong silver bath. With this paper, however, they can be produced at will, and have all the rich tones and pure whites to be seen in the silver prints of old.

The manipulation of the glossy paper is just the same as that of the matt. It may, also, be toned in the usual sulphocyanide bath, and, indeed, for the warmer shades of brown, I am rather inclined to prefer it to the acetate-borax bath, though for purples and blacks the latter gives the best results. Some of the advantages of these papers are that there is no tendency whatever to double tones or blistering. They yield the most delicate half-tones of the negative in perfection; even when the toning is carried to the darkest colours, the lights also retain their whiteness.

Here is another quality that will commend itself to professional photographers, which is that the prints can be blotted off and dried quickly and, like albumen ones, they can be mounted wet without fear of injury if they be trimmed before toning.

E. W. Foxlee.

FROM OXFORD TO DORCHESTER.

[Reprinted from the "Handbook to the Photographic Convention of the United Kingdom."]

The Thames has been well styled "The Royal River"—not only because of its propinquity to Royalty as it travels by Windsor and Hampton Court, and its world-wide importance as the entrance to the port of London, but also on account of its great natural beauty. For though the Dart and the Fal, and some other of our English rivers, have a wild and rugged grandeur of their own, nevertheless for quiet, pastoral English scenery, combined with the pictorial effect which uplands and woods can give, the Thames can very well hold its own with any other river in the land; and those who wish to have a practical illustration of what the scenery on the Thames is like will do well to patronise the trip to Day's Lock during the Convention week.

For some reason, the origin of which is lost in the mists of antiquity, the River Thames, from a little above Oxford (about as far as Cricklade) to a little below Oxford (about as far as Sandford) is almost invariably denominated the Isis. As far as Oxford city and University are concerned, this may be called invariable; the average Oxonian would not be unlikely to inquire what river it is that you want if you asked for the Thames! Various beautiful theories of a poetical kind have been promulgated as to the origin of the name, but there seems no reason to believe any one of them more than the others, and the visitor is advised not to trouble himself with investigating the cause, but to accept the fact as he finds it. The Isis at Oxford is also divided into the "Upper River" and the "Lower River." The former is that part above Folly Bridge, which extends along Port Meadow to Godstow; the "Lower River" is the part on which are the College barges, and which extends from Folly Bridge in the direction of Iffley and Nuneham. It is on the Lower River that the excursion is to take place.

There are few prettier sights than is presented by the Isis from Folly Bridge on a bright spring day, when the trees along Christ Church meadows are just bursting into leaf, and "coaching" for the races is in full swing, the crown of the year being, of course, the "Eights" week, when the barges are crowded with an immense assembly of "sisters, and cousins, and aunts," who have come from long distances to witness their undergraduate relatives' prowess in their respective boats. Even though the Convention meeting takes place in the dusty summer, when Oxford is comparatively empty, there will doubtless be many who will think the river from Folly Bridge, or a little farther down the towing-path on the right-hand side, worthy of reproduction upon the film of their dry plates. The excursion starts from Folly Bridge, a structure which replaced the ancient Grand Pont of Norman days—a bridge which had no fewer than forty arches. It is now only commemorated in the name of the district of Oxford which lies across the bridge.

Once embarked upon the waters of the Isis the visitors will soon make a closer acquaintance with the College barges which line its left bank. These are remnants of the type of City Barge belongi to the ancient Guilds of London, but their form has undergone in er- able modifications, according to what the designer considered ost suitable for affording a good view of the races, until the origina ype has been almost lost. It exists most prominently in the barge b ng- ing to Oriel College, which alone amongst its fellows has retain he elaborate figures on each side of the entrance, and the long, low ow, in which the rowers sat in bye-gone days.

At Iffley, which is reached shortly after passing the barges, re are two objects of interest. One is the Mill, which is seen on th eft side of the lock, and which forms a picture from the meadows he other side of the river which has been hung many a time upon the lls of the Royal Academy. The other is the Church, the grey stone er of which is seen rising from the slope on the left. This is at th nd of the village, and necessitates a short walk. It is worth the k, for it is one of the finest examples of small Norman churches be found anywhere in England. Unfortunately it has been much res d, but many of the original features are still intact, notably the nd Norman entrance at the west end, and the Tower. The Church as probably built by Robert de Cheney, Bishop of Lincoln, about 0, and afterwards given to the Priory of Kenilworth. The chan is divided into two portions, and the eastern end is thought by so to have been added by Robert de Iffley, Prior of Kenilworth, about 0. There are some good Perpendicular windows in the tower and re, inserted in the original Norman frames, which are ascribed to an de la Pole, Duke of Suffolk, about 1470. His arms are in the win ws on the south-west side of the nave. The font is a splendid speci n, and as old as the original Church. The Churchyard contains a res d Churchyard Cross, and a yew tree of immense age, which has pro ly existed through the various restorations of the Church by its side

Some little distance up the river the steamer passes Kenni on Island (at the back of which is the little village of Kennington), w h island is worthy of a plate; and further on we enter the lock by e side of an old inn, which, in its way, is rather a picturesque struct

On the other side of the lock the country shortly becomes re wooded, and before long the steamer arrives at the estate of Au y Harcourt, Esq., in the village of Nuneham Courtenay. The woo d Nuneham slope right down to the water's edge, and the count is extremely picturesque. A small island is seen on the left, whic is joined to the Nuneham bank by a rustic bridge, with a cottage r the landing-place. The view of this bridge and cottage must re been utilised by photographers some thousands of times.

There is nothing special in the exterior of the house at Nunel m, though it stands on an eminence and presents a fine appeara e. The estate is an old one, and in "Domesday" times was the prop y of Milo Crispin. It was afterwards the property of the Earl f Devon, a daughter of whose house married in 1214 Robert Courte y, Baron Okehampton, from whom the village derives its second n e. After various owners the estate entered the Harcourt family by c- chase. In the park is the ancient Conduit which used to stand in e centre of Carfax, Oxford. It was built by Otho Nicolson, w e initials are on it. It was erected at Carfax in 1610, and removed p meal to Nuneham in 1787, where it was reconstructed.

On the other side of Nuneham there is nothing of special inte t, until we arrive at Abingdon. The approach to the town, as seen f m the river, is very picturesque, with the old houses on the left ba d by the bridge, while the tower of St. Helen's dominates the v . Abingdon is a town of very ancient origin, dating from Saxon ti s. The chief points of interest are the two old Churches, the rui f the Abbey, the Market Cross, bridge, and river. The Abbey cording to tradition, was founded in the seventh century. It a wards rose to enormous importance, being one of the wealthiest m d abbeys in the kingdom, and was the original cause of the ris f Abingdon to its important position. Of this once prosperous fou tion very little remains. The ruins are reached by a short road f m the market-place. The remains of the Abbot's Apartments and e Crypt still exist in a house near the ruins.

Adjoining the Abbey Gateway is the old Church of St. Nich , in which the chief points of interest are a Norman doorway, an a little turret which surmounts the tower and forms the roof o minstrel's gallery of great antiquity.

At the side of the Market-place is the Market Cross, designed Inigo Jones, erected in 1667, and restored in 1853.

St. Helen's Church is a magnificent structure, and has the v unusual feature of five aisles. Each aisle has a name, viz., the Je aisle, Our Lady's aisle, St. Helen's aisle, St. Catherine's aisle, the aisle of the Brethren of the Holy Cross (a most ancient or existing in Abingdon's early days). There are said to be only or three other five-aisled churches in the kingdom. The architect of the Church is mainly in the Perpendicular style.

On the south-west side of St. Helen's Churchyard is a highly turesque row of houses forming the more ancient portion of "Hospital of Christ." The doorway is a beautiful piece of old w in the centre of the arcade extending along the bottom of the bu ing. There is an old Hall panelled with wood. Thirty-six old m and women are now maintained by this institution, which was foun by the brethren of the Holy Cross, a confraternity which existed

38, but was probably founded long before that time. This institu-on, unlike many of the same class, has flourished exceedingly, and s grown so rich that thirty-six men and women, as previously ated, are maintained instead of only the fourteen men who were iginally arranged for, a new wing having been added to the old ilding.

Leaving Abingdon, a little farther up the river, Culham Church is en through the trees, and further on, on the right, is seen Witten-m Clump, which forms a good background to the river scenery.

Shortly after this the river enters a straight cut, at the end of hich is Clifton Lock, with a picturesque lock-keeper's cottage, vered with creepers, and fronted by an old-fashioned garden. Just yond the lock the river runs under the bridge at Clifton Hampden, small village on the road between Culham and Dorchester. The ew of the bridge, which has six pointed arches, and the Church ove it, is very picturesque. The Church rises on a hill abruptly om the water's edge. From the Churchyard the view is beautiful, t the Church itself is not historically of great interest. The vil-ge possesses a number of pretty thatched cottages, and a celebrated n much utilised by painters as a subject. This is called the "Barley ow," and it stands in a small corner, off the main road. Its age unknown, but it has a high overhanging thatched roof, and half-mbered walls, with little old-fashioned windows. The kitchen has a w ceiling, a brick floor, and a fireplace extending all down one de of the room. Unfortunately it has been somewhat spoilt from artistic point of view by recent modern additions, rendered neces-ry by the ever-increasing number of summer visitors. There is a tle old-fashioned garden behind the house.

Just beyond Clifton Bridge the scenery becomes very pretty, the nks being thickly wooded. Shortly before reaching Day's Lock, owever, the fields again commence, and this piece of country is a od example of the usual Oxfordshire type. On the right bank of e river is seen Sinodun Hill, and before long, on the Oxfordshire nk, there comes into view an old church with an unusually long nave, d a rather tall tower. This is the Abbey Church of SS. Peter and aul, Dorchester, which forms the termination of the excursion.

Of the village of Dorchester, as of "Tara's Halls," it may be said at "sleeps the pride of former days," and "glory's thrill is o'er." ot but what it is still a charming specimen of country village, and oasts in addition to its natural charms, an ancient lineage and a lendid church, but the Dorchester "of former days" was a city f immense importance long before the University or City of Oxford ad been thought of, even if we accept as fact the foundation of niversity College by Alfred the Great in 872! It was the capital f one of the largest divisions of the Saxon Heptarchy, and principal ity of Cynegils, King of Wessex. It was much more besides is, for it was the seat of a bishopric which enclosed within its cclesiastical jurisdiction the present dioceses of Winchester, Salis-ury, Bath and Wells, Lichfield, Worcester, and Hereford,—being he largest see in England.

Of all this scene of wealth and grandeur nothing remains but the ne old Church, and various traces of antiquity, architectural and therwise, scattered about the village in farm-houses and other places.

Dorchester is approached by a footpath (about half a mile long) rom Day's Lock. The village stands on a slight eminence, which akes it conspicuous from a distance, and adds to its picturesque-ess. Not far from the footpath, and running by the side of it, are een the famous Dyke Hills, in ancient times a Roman fortress. They re now locally known by the name of "Dorchester Clumps."

The first Bishop of Dorchester was St. Birinus in 635, and there, n his Cathedral, he baptized the aforesaid Cynegils, King of Wessex, aving converted him to the Christian faith, about 12½ centuries ago. ome parts of the original Saxon Cathedral still remain, but the rchitecture of the Church now represents many styles, from Norman o Tudor. The area covered by the edifice is over 10,000 square feet, ts length is 183 feet. The Chancel has two bays, the one farther east vas probably the Ladye Chapel, built about 1330. On its left (north) ide is the celebrated Jesse Window, which represents the descendants f Jesse springing from the Patriarch himself, who lies recumbent at he foot of the window. The Church has the usual beauties of old hurches in the forms of sedilia and piscina with richly carved canopies, which are under the window on the right (south) side.

There were probably at least two chapels originally on the north, nd three on the south side of the chancel. At the end of the south hancel aisle, two of these chapel have been retored, as much as possible to their pristine condition, by Sir Gilbert Scott.

In the south-east angle of the nave aisle is another altar, raised upon two broad steps, underneath which is a crypt. Over this altar is an ancient fresco. The font, which is near this altar, is of lead—a very unusual feature. It has round it figures which are supposed to represent the Apostles. The font is Norman work on a Perpendicular base.

The north aisle was built about 1280, the south choir aisle about 1300, the south nave aisle about 1320, and the tower about 1680. Near the tower end of the church outside is the National School, which is supposed to be the refectory of the old Abbey, which is credited with an antiquity of seven centuries.

In the year 1070 William the Conqueror appointed a monk of Feschamp (St. Remigius) to the Bishopric of Dorchester, and he afterwards removed his see to Lincoln. After this Dorchester gradually declined in importance, until it became the quiet village that we now see it.

On returning from Dorchester, if any time remains it may well be spent in photographing the pretty bits of scenery at or around Day's Lock, or in a stroll to the top of the "Clumps," from which there is a magnificent prospect. Further off (1½ miles from Dorchester) are seen Wittenham Clumps, which are reached by walking back to Day's Lock, crossing the river by the wooden bridge, and continuing along the road past Little Wittenham Church. These being higher, a still more extended view is obtainable from their summits.

REGINALD A. R. BENNETT, M.A.

THE CONVENTION: HOTELS AT OXFORD.

FOR the information and guidance of intending visitors to the Convention, who may not be members, and have not therefore received a copy of the official Handbook, we extract from the latter a list of hotels, &c. As a very large gathering is expected the early booking of rooms will be a wise step.

Randolph Hotel (opposite the Martyrs' Memorial).—Bedroom, 3s. to 5s.; service, 1s. 6d.; table d'hote breakfast, 3s. 6d.; dinner, 5s.

Clarendon Hotel, Cornmarket-street.—Bedroom, 3s. 6d. to 6s.; service, 1s. 6d.; breakfast, 1s. 6d. to 3s. 6d.; dinner 5s.

Mitre Hotel, High-street.—Bedroom, 3s. to 5s.; service, 1s. 6d.; table d'hote breakfast, 3s.; dinner, 3s. to 5s.; or en pension, 3½ guineas per week.

King's Arms Hotel, Holywell.—Bedroom, 3s.; service, 1s.; breakfast, 1s. 6d. to 2s. 6d.; dinner, from 3s.; board, if preferred, 9s. per day, or £3 per week. Dark room free.

Roebuck Hotel, Cornmarket-street.—Bed, breakfast, table d'hote dinner and attendance, 10s. 6d. per day. Dark room free.

Golden Cross Hotel, Cornmarket-street.—Bed, breakfast, dinner, and attendance, from 9s. per day.

Castle Hotel (near the railway station).—Bed, 2s.; breakfast and tea, 1s. to 2s; dinner, from 2s. No charge for attendance.

TEMPERANCE HOTELS.

The Wilberforce, Queen-street.—Bed, from 2s.; service, 1s.; breakfast, 1s. 6d. to 2s. 6d.; luncheon, from 2s.; dinner, from 2s. 6d.

Eastgate Hotel, High-street (near Magdalen College).—Bed, from 2s. 6d.; attendance, 1s.; breakfast, 1s. 6d. to 2s. 6d.; luncheon, cold, 2s., hot, 2s. 6d.; dinner, from 3s.

BOARDING HOUSES.

Alexandra Hall, Magdalen-street.—From 5s. per day, or 1 guinea per week.

Miss Purday, 48, Wellington-square.—From 7s. 6d. per day. Ici on parle Francais.

J. F. Knott, 90, High-street.—7s. 6d. per day.

The Isis, Iffley-road.—From 5s. per day, or 25s. per week.

St. Freda's Hall, 98, St. Aldate.—6s. per day.

St. Aldate's Boarding House (Miss Brice).—From 6s. per day, or 30s. per week.

PRIVATE APARTMENTS.

A list of private apartments with terms will be forwarded on application to the Hon. Local Sec.

RESTAURANTS AND TEA ROOMS.

Hotel Restaurant Buol, 21, Cornmarket-street. Beds if desired.
The Queen's Restaurant, Queen-street.
Boffin's, Carfax, and High-street (near St. Mary's Church).
Oriental Restaurant, Cornmarket-street.
Cooper's, Magdalen-street.

THE CARL ZEISS WORKS AT JENA.

II.

THE LENS MANUFACTORY.

THE lens manufactory, especially, has its own unique methods of doing business. A large telescope is looked upon as an artist would look upon his newest picture. It must be as perfect as it can be made, time and cost of materials notwithstanding, and when it is finished it is billed on the basis of its cost. Cheap instruments are made to provide work and training for the younger and less experienced workmen. And yet so great is the demand for the fine products of the factory that it cannot be supplied. Curiously enough, also, no patents are taken on instruments and processes, like microscopes and microscopic attachments, which are solely used for the advancement

of science, the men behind this unique institution having their hearts too deeply set on the advancement of human knowledge to hinder it by monopolies. The product of high-grade microscopes alone at this factory is over 1800 a year, and each microscope comprises the work in some detail of over fifty men.

And now I come to what is, perhaps, the most interesting feature of all in these astonishing business enterprises, the feature which makes the lens manufactory in particular really more of a public institution than an enterprise for private gain.

Professor Abbe lives just across the street from the huge buildings of the lens manufactory. His home is a little one and a half-storey building, old-fashioned, and German-like. It is thickly surrounded with trees and shrubs, and laid out with flower beds. At the time I saw it the lilacs were in full bloom, and the fragrance, drifting across the street, filled the rooms where the glass polishers bent low to their work. Here Professor Abbe has worked year by year, in his favourite field of optics, mathematics, social economy, invention; and although now well along in years, he is not lacking in his zest for new and more difficult problems. Every summer he takes a short vacation in Switzerland, where the people of the village at which he stays know him merely as "the German professor." Thus quietly he has lived, watching the factories rise around him and win him a fortune. From the first he was deeply interested in the welfare of the working-man—an interest hardly second to his love for science—and out of this interest grew the Carl Zeiss Stiftung (Institution), named from his friend, Carl Zeiss, which now controls the entire lens manufactory with its 1200 or more workmen and owns a half interest in the glass works with its 400 workmen.

The Stiftung.

The Stiftung is unique among institutions. It is the creation of a law of which Professor Abbe was the author, and it is in the nature of a corporation under State control. To this Stiftung Professor Abbe turned over all his interest in both of the great plants at Jena, retaining only a directorship. A commissioner of the Grand Duchy visits the works every week and assists the local directors in carrying out the tenets of the law. The purpose of the Stiftung is twofold. First, it provides for the comfort of the personnel of the works from the directors to the lowest apprentice boy, by means of a unique system of pensions, sick benefits, profit-sharing, and educational advantages. Second, it provides for large contributions towards the advancement of science. No one connected with the institution receives any of the private profits of ownership. Professor Abbe himself receives merely the salary of a director which, according to the law controlling the Stiftung, can never be more than ten times the average salary of the "standard" workman of the shop—the workman who is more than twenty-four years of age and for more than four years in the service of the firm. This standard workman now receives less than £100 a year. But Professor Abbe is entitled to a pension when he shall cease his active connexion with the business, the same as every other employee. If it should be absolutely necessary to discharge a workman, he must not only be given due notice, but the Stiftung must pay him, if he has been employed for more than three years, a sum equal to his total wages for from six months to two years, according to the length of time he has been in the works. And after five years' service every workman who retires for age or invalidity receives a pension, or should he die, his family is pensioned. In this way he is absolutely secure in his work. The Stiftung sets aside a certain definite sum from its earnings every year, and this is so invested outside of the business that it will pay all pensions and discharge advances, thus making the pension system independent of the vicissitudes of the business, for even though the business failed, the money would be on hand to pay the regular pensions of old and faithful servants. Every workman is given a two weeks' vacation every year with pay for half of it, and he is also paid in full for all holidays except Sundays. Moreover, the whole lens manufactory, with Professor Abbe at its head, is like a great family. Every month a delegate from each of the departments, thirty in all, meet with the directors and discuss the conduct of the work. These delegates are never foremen, but represent the men themselves, and the suggestions they make are from their own point of view, not from that of the foremen. Last spring the subject of shorter hours of labour came up, a subject of which Professor Abbe and the other directors had already been thinking. The workmen delegates to the conference suggested eight and one-half hours a day: the directors promptly responded, "Why not try eight hours?" Every workman was questioned, and six-sevenths of them asserted that they could do as much work in eight hours, working faster, than they could in the longer day. Lens grinding is very confining work, especially fatiguing to the eyes, and even more so to the nerves. So on April 1, 1900, the experiment of an eight-hour day—a very great innovation in Germany—was begun. If at the end of one year it is successful, the plan will be continued indefinitely. The hours of work are now from 7 to 11.30 a.m. and from 1.30 to 5 p.m., the long nooning giving the men ample time to go home to dinner and to rest thoroughly for th afternoon's work. Director Fischer informed me that the plan so fa as it had been tried was a great success, fully as much work bein accomplished in the short day as had hitherto been accomplished i the long day, and he thought that the work was of better quality although the experiment had not then been in progress long enoug to permit of positive assertions.

In addition to these advantages to the personnel within the work themselves, the Stiftung has spent large sums of money in othe directions. I visited an extensive and highly popular free readin room, said to be the largest institution of its kind in Germany, th Germans having always depended on the cafés for their periodic literature. A fine library building to contain a good collection books as well as this reading-room is soon to be constructed. Th Stiftung also contributes largely to the local hospitals that its work ing-men may be cheaply treated; it has established special course of instruction for its men in mathematics, physics, drawing, mechanic and in the German, English, and French languages; it has institute a free swimming bath in the Saale River; and it is helping to buil walks and summer houses along the mountain sides and in the forest around the town—those strolling and social spots which a German s dearly loves.

All of these advantages help to attract to the lens manufactory a unusually intelligent and productive class of workmen—and indee for these fine operations great intelligence is required. So far a possible young men are taken and especially trained to the requirement of lens-making, and as they grow older, the cumulative advantage of the pension and profits system, as well as the short hours, ten to keep them where they are, even though tempted elsewhere by offer of higher wages.

These are by no means all the advantages which the Stiftun offers its working-men, but they will suffice to indicate its purpose in this direction. In its other activities, science has already felt th influence of the Stiftung. It has established and equipped a fin astronomical observatory in the University of Jena, it has founded new chair of mathematical physics, and will build a fine laborator for experimental physics, and it is a large contributor yearly to othe departments of investigation at the University. Nor are its interest confined alone to Jena, but extend to science in general, even to th considerable assistance of a recent Polar expedition. Such activitie as these, and they are as much a part of the business of the Stiftun as the making of glass and lenses, seem odd enough as looked upo from the exceedingly practical point of view of ordinary business life

The Stiftung has now been in existence nine years with grea success. The profits of the business have been large, and its activitie in science and in benevolence have been correspondingly large. I was the State that helped the work in the beginning by its libera contributions of money that enabled Professor Abbe and his associate to carry on their experiments, and now the German people, and in deed humanity in general, are reaping the reward. And in case th Stiftung should ever go out of business, for whatever reason, one half of the proceeds remaining after the debts are paid will go to th city of Jena, to be used for the good of its inhabitants, and one-hal to the University of Jena. Not a cent is reserved for private dis posal.

Professor Abbe devotes most of his time to the working out of thi great philanthropic idea. Anticipating at the time he drew up the la governing the Stiftung that forethought could not provide for ever possible condition, he reserved to himself the right, until the ye 1906, to make changes in the statute. In this way he is able to co rect any errors or injustices as time and experience point them ou After 1906, however, there can be no more changes: the law will b absolute and perpetual, and as long as lenses are made at the Car Zeiss works, so long will its workmen enjoy advantages almost with out equal anywhere in the world, and so long will science have a strong and faithful ally.

R. S. Baker.

Our Editorial Table.

Merck's Annual Report for 1900.

Published at 16, Jewry-street, London, E.C.

The annual report recently issued by the well-known chemical estab lishment of E. Merck, Darmstadt, although appealing more particu larly to those engaged in medical and pharmaceutical pursuits, has some points of interest for photographic readers. The scope of the book, which extends to over 220 pages, is indicated by the following extract from the preface:—"The publication at the beginning of this year of the Fourth Edition of the Pharmacopœia Germanica has caused a series of criticisms to appear in chemical and pharmaceutical journals In all these articles the subject is discussed almost solely from the aspect of practical pharmacists and analytical chemists. It seemed

efore desirable to review the new edition of the German Pharmacœia from another point of view, that of the large manufacturers pharmaceutical products. The original communications contained his report constitute an attempt made on my part in this direc-. I entertain the hope that my notes may lead to numerous in-igations calculated to furnish a basis for the improvement of future ions of the Pharmacopœia." The book purports to be a compila- of facts and descriptions relating to substances that have recently ed importance in chemistry. The photographer will note three he sometimes uses. Thus: "Palladium chloride in photography is, the recommendation of Ardaseer, employed more largely than etofore for toning silver prints. As shown by Kessler, palladium as (1:48), when applied to matted silver papers, have over platinum ng baths the advantage that they effect a more complete trans-ation of the silver picture in consequence of which the toned ure is more permanent." Of ceric sulphate the following note iven:—"It has been found by Lumière and Seyewetz to be an ellent reducer for photographic reproductions, and to possess con-rable advantages over the mixture of potassium ferri-cyanide and osulphite of soda ordinarily used for this purpose. Solutions of c sulphate acidulated by the addition of a few drops of sulphuric can be kept for any desired period, they act uniformly upon the e, and do not cause striæ and fogging. Cerium sulphate is also ilable for use with bromide of silver gelatine paper. When it desired to reduce an over-exposed plate, so as to endow ith plenty of contrast in the lights and shades, it should, while , be laid into a 5 per cent. solution, whilst a 1 per cent. solution, which the plate is immersed after wetting in water, suffices to pro-e a mild effect without materially affecting the contrasts in the ure. The 1 per cent. solution is sufficiently concentrated for er, and by means of appropriate dilution the solution can be made ct sufficiently slowly." Of ammonium persulphate, it is said that has secured a permanent position as a reducing agent, since, in tradistinction to the other usual media, it reduces mostly the sest portions of the over-exposed plate. This preparation is there-a reliable means of reducing to a normal condition negatives ex-ting an excess of contrast. This is a feature which is greatly ed in portrait photography. Bolton describes ammonia persulphate only as an excellent reducer but also as a good retarding medium. fessor Namias has, moreover, found that an over-exposed carbon t can easily be developed in water if it be placed for half an hour, onger, in a 1 per cent. solution of sulphuric acid and 5 per cent. monia persulphate. The action of this developer is based upon the lation of the chromium oxide, in consequence of which chromic is formed." Our extracts will serve to show the value of Merck's ual, to future issues of which we look forward with interest.

A New Trade Price List.

ished by Messrs. Alfred Raines & Co., Photographic Works, Ealing, London, W.

new trade price list just issued by Messrs. Raines proceeds from rm whose enterprise covers a large field. They are artists in water colour, and black and white, enlargers in bromide, carbon, inotype, printers in all processes, and half-tone block engravers. book before us particularly appeals to the professional photo-pher. It contains eight large admirably executed views of the ipal parts of the firm's works, which are obviously well adapted the production of high-class printing and enlarging. The artists' lio, the bromide enlarging room, the copying and retouching lios, and the engine house of Messrs. Raines' establishment are wn in working order, and the firm is distinctly to be congratulated the completeness and excellence of their technical arrangements. enty-two pages of the list before us are devoted to the setting forth rices for many descriptions of printing and enlarging, and the list laimed to be the largest of the kind appealing to the trade. Messrs. nes print the following useful notes on enlarging for the informa-of their clients:—"All negatives sent us should be ready for rgement, but if spotting or retouching be required, it should be ed when ordering, and a charge will be made according to work uired. In sending orders, please state full particulars, such as gnette,' 'Bust,' Half-length,' 'Size of head,' &c. If required to finished in oil or water colours, details of colour should be sent. use our own discretion as to whether an enlargement should be netted or printed solid, if not stated in order. If required not vig-ed, the terms 'Solid' should be used. By a plain enlargement understand an unfinished enlargement. A print from the original ative should be sent as a guide to the artist. When enlargements ordered to match, if one is required to be reversed, instructions this must be given. We understand 'to pair or match' to mean that rgements are to be uniform in size and finish, and we cannot take responsibility of reversing unless an order is distinctly given." are indebted to Messrs. Raines for a special opportunity of judging he quality of their work. At our side as we write is a nearly life-carbon enlargement. It represents the editor of this Journal, and the negative, from which last year's Convention Handbook frontispiece was printed, was taken by Mr. H. Walter Barnett, of 1, Parkside, Knightsbridge, S.W. The many friends who have already seen this enlargement pronounce it a high-class piece of technical work, and we are exceedingly pleased with it ourselves. The pigment has been happily chosen to match the subject; the likeness is declared to have been well preserved, and the production as a whole reflects the greatest credit on Messrs. Raines' skill in carbon enlarging.

The M.Q. Cartols.

Prepared and sold by John J. Griffin & Sons, Limited, 20-26, Sardinia-street, Lincoln's Inn Fields, W.C.

Messrs. Griffin inform us that the M.Q. developer, which they have hitherto sold for use with gaslight development papers, has been subjected to experiment in order to adapt it for use with plates and films, without affecting its characteristic qualities It is claimed to be clean in working, and to possess strong detail forcing qualities. Messrs. Griffin add:—"Many of your readers may, at this season, be interested to hear of such a developer, and for this reason we are bringing it more prominently forward. The developer is sold in packets at 2d., making 4 oz. of developer for plates, and in 3d. packets, making 10 oz., or in cartols at 4½d. each, making 10 oz." In a practical trial of the M.Q. cartridges, six prints from a negative of average quality and density were developed. The tone was bluish-black, the whites pure, and the prints are as good as one could wish. We then diluted the solution to the strength recommended for plates, and developed two stale exposed plates we have had by us for three years. We got good negatives, and our impression is that the staleness is less apparent than with a fresh pyro-ammonia solution. This may be due to the substitution of a carbon for ammonia, and to the edge of the developer being taken off by the previous development of the prints. The solution was then left exposed in the measure till the next day. Two Ilford Ordinary plates were exposed 1-16 second at *f*-7 after 3 p.m., street figure subjects. The developer was the colour of port. We obtained printable negatives from what we believe were under-exposed plates.

Tabloid Photographic Chemicals.

Manufactured and sold by Burroughs Wellcome & Co., Snow-hill-buildings, E.C.

Messrs. Burroughs Wellcome and Co. have submitted to us a specimen of 'Tabloid' sulphocyanide toning bath, which is uniform in packing with their other 'tabloid' toning products, being sent out in two tubes enclosed in a carton. One tube holds six tabloid products, each containing ½ grain of gold chloride, the other a corresponding number of tabloid sulphocyanide compound, each consisting of 5 grains of sulphocyanide and ¼ grain of sodium sulphite. The following are the instructions for use:—Dissolve one tabloid sulphocyanide compound in four ounces of water, and tabloid gold chloride ½ grain in a separate ounce. Add the gold solution to the sulphocyanide solution gradually. The bath is then ready for use. Messrs. Burroughs Wellcome and Co. draw our attention to the fact that they have succeeded in practically overcoming the hygroscopic tendency of the sulphocyanide, a claim which, upon practical trial, we find to be fully verified. It may be useful information to our readers if we enumerate the principal photographic chemicals which are issued in tabloid form by this firm. They are as follows:—Developers: Pyro developer, pyro-soda developer (Ilford formula), hydroquinone (quinol) developer, metol developer, amidol developer, eikonogen developer, paramidophenol developer, ortol developer, metol-quinol developer, glycin developer. Fixing: Sodium thiosulphate (hypo). Accessory: Potassium bromide, ammonium bromide, sodium citrate, ammonium persulphate, sodium sulphite. Toning Baths: Gold chloride, with either sodium formate, sodium phosphate, sodium tungstate, borax, or sodium bicarbonate; platinum compound. We have also received from Messrs. Burroughs Wellcome and Co. an advance copy of a new edition of "Practical Points concerning Tabloid Photographic Chemicals," and the firm ask us to state that they will be happy to send this book gratis and post free to any of our readers who apply to them. Attention is particularly directed to the non-secret nature of Tabloid photographic chemicals, and the definite statements made as to the weights and constituents of Tabloid developers, &c.

Studio Gossip.

Class Tree Planting at an American Photographic College.—"The beautiful custom of class tree planting was recently inaugurated by the Illinois College of Photography, and the initial step was taken with great glee as well as with appropriate solemnity. Gradually the College of Photography is taking on the airs of a university," says a recent issue of the "Effingham Evening Democrat," "and the purely business influence which at first characterised its existence is giving way to the

higher poetic atmosphere of an educational institution. The students did not stand idly by waiting for some master of ceremony to do perfunctory work for them to passively gaze at, but they all entered into the exercises with the greatest of glee. Trees may have a beauty and meaning for every one as they doubtless do, but to no one do they come with a sweeter and more intelligent message than to the student of photography. The class of 1901 chose as its class tree the stately elm. A better tree could not be selected. It is long-lived, hardy, and possesses great beauty of form. It is at once symbolic of the love of the student for his alma mater and prophetic of his long devotion to it. At three o'clock the students, faculty, and friends, gathered in the assembly room of the College to celebrate the day with song, poetry, and story. The assembly room was filled to overflowing, both in number and in spirit. Professor Mumford acted as chairman, and President Bissell as the honoured guest. The opening number was 'America,' in the singing of which the whole audience joined with great zest, after which was a song, attuned in voice and sentiment to the occasion, by the college quartette. Mr. George M. LeCrone was introduced and delivered the regular address of the day. He spoke extemporaneously from notes and consequently the address cannot be given. He treated the subject from the practical, ethical, and poetic standpoints, and emphasised his points with story, poetry, and song. The beauty, glory, and grandeur of the trees stood forth in a new light after the illustrations and recitations from the masters. Genesis,'America,' 'Home, Sweet Home,' 'Old Oaken Bucket,' 'Ben Bolt,' Longfellow, Bryant, Mrs. Hemans and Whittier were drawn on for a wealth of quotations. The exercises concluded, the whole audience repaired to the campus where the elm tree was duly planted with a bottle containing much valuable information of the institution. With uncovered heads each student put in a shovel of dirt. At the conclusion the College yell was given and the ceremony ended."

News and Notes.

At the Royal Photographic Society's Ordinary Meeting, on Tuesday, June 11, 1901, at 66, Russell-square, at 8 p.m., Mr. William Webster will read a paper, entitled "Notes from five years' work with X-rays."

The Luxia Company, of South Hill Works, Hampstead, London, inform us that they have acquired the business of Messrs. Berger and Co., as manufacturers of the "Luxia" photographic printing papers.

The Convention.—The title of the paper to be read by Dr. Moritz von Rohr, at the Oxford meeting of the Photographic Convention of the United Kingdom is: "On short focus lenses with special reference to depth of field."

London and Provincial Photographic Association.—On Thursday next, 13th inst., Mr. A. L. Henderson will give a lantern lecture upon "Science up-to-date," to which members are invited to bring lady friends. The meetings are at 8 p.m., at the "White Swan," Tudor-street, E.C.

The Chicago Society of Amateur Photographers has decided to hold its second salon in the galleries of the Chicago Art Institute from October 1 to October 22, 1901. The purpose of this salon is to bring together the best examples of the photographic work of the year, rigidly to be selected by a competent jury of photographers and artists. Particulars may be had shortly by addressing the Executive Committee, Chicago Photographic Salon, The Art Institute, Chicago, Illinois.

Lightning Photography?—Most of us have, at one time or other, read of persons, who have unfortunately been killed by lightning, having images of near surrounding objects photographed upon their chests. In the report of the inquest on the bodies of two persons who were killed by lightning at Stretton, near Coventry, one day last week, it is stated that, on the chest of one of them, distinct tracings were discovered of the tree under which he was taking shelter at the time of the thunderstorm. Imagination goes a long way in cases of this sort, and old traditions die hard. The bodies of persons struck by lightning are often marked by the passage of the fluid and, by some stretch of the imagination by ignorant people certain forms are supposed to be recognised, usually of some immediate object. Of course, to suppose that lightning photographs, or impresses, actual images of adjacent objects on the skin of its victims is a fallacy.

Standard Silver and Sterling Silver.—In the course of a series of articles in "Knowledge" on the subject of standard silver, its history, properties, and uses, Mr. Ernest A. Smith remarks that "Although sterling silver was used in England for the manufacture of plate at a very early period, 'the Anglo-Saxons being always reckoned skilful in the use of gold and silver,' the first statute made for regulating the standard of silver to be used by workers in this metal in England is that of the 28th Edward I., c. 20 (A.D. 1300). It ordains that goldsmiths shall make no worse silver than 'silver of the sterling alloy of the coin, or better at the pleasure of him to whom the work belongeth.' . . . 'In consequence, however, of the adoption by silversmiths of the practice of melting the coin of the realm to convert it into plate, legislation for the protection of the coin became necessary in the reign of William the Third,' and 'an Act was passed which raised the legal standard for silver plate above the standard of the coinage, thus rendering the latter less available to the silversmith.' In order to distinguish plate of this new standard it was appointed that it should be marked with the 'figure of a wom commonly called Britannia.' On account of the softer nature of the n standard, due to the larger percentage of silver present in it, it w found that articles made of this alloy were not so serviceable nor durable as those made of the old standard. By an Act of Parliame the 6th George I., c. 2, s.s. 1 and 41 (A.D. 1719), the old standard 11 ozs. 2 dwts. (925) was revived concurrently with that of 11 ozs. 10 dw (959), and these two standards still exist for plate, though only t former is in general use."

The Greenwich Visitation.—In accordance with custom, the board visitors made their annual visitation to the Royal Observatory, Greenwic on Saturday last. As President of the Royal Society, Sir Willia Huggins is chairman of the board, and the whole of the visitors we present with the exception of Sir William Abney. The nominat Fellows of the Royal Society in attendance were the Earl of Rosse, Lo Rayleigh, Sir J. Norman Lockyer, Sir George Stokes, Professor W. Adams, and Professor A. W. Rücker. The Royal Astronomical Socie was represented by Dr. J. W. Glaisher, president, and three oth Fellows—Sir Robert Ball, Professor R. B. Clifton, and Dr. A. Common. The remaining members of the board were Professor H. Turner, Savilian Professor of Astronomy at Oxford; Professor G. Darwin, Plumian Professor of Astronomy at Cambridge; Rear-Admir Sir W. J. Wharton, Hydrographer of the Navy; with Mr. W. Barber as secretary. It was to these gentlemen that the Astronom Royal (Mr. W. H. M. Christie) gave his account of the year's progre at the Observatory. An international character was imparted to th gathering by the presence of M. Loewy, director of the Paris Observator and among the other guests were Sir William Church, president of th Royal College of Physicians, Sir Frederick Pollock, Sir H. H. Howorth Professor Niven, C.B., Dr. Isaac Roberts, F.R.S., and Mr. H. Cunynghame, Assistant Under-Secretary at the Home Office. Accordin to the Astronomer-Royal's report, during the recent opposition, th planet Eros has been photographed with the Thompson refractor fo determination of the solar parallax. The new star in Perseus, fir seen at Greenwich on February 25, has been photographed every nig since, when weather permitted. It will be remembered that the Admi alty sanctioned an expedition to Ovar, Portugal, for the purpose observing the total eclipse of the sun on May 28, 1900. As a resul the Astronomer-Royal obtained five large-scale photographs of the corona Mr. Davidson four pairs of small-scale photographs showing the extensio of the corona, and Mr. Dyson two photographs of the corona spectrun The mapping of the heavens has made considerable progress during th year—indeed, this international sidereal observation and record is no nearly complete. The total number of photographs taken in the twelv months was 682. Mr. Christie reported to his visitors that the secon ten-year catalogue of 6892 stars for 1890 has been published. As preliminary step in the determination of the proper motion of a Groombridge stars, 4000 in number, a new reduction of Groombridge observations had been undertaken, and was steadily proceeding. Th observations of the greatest interest during the year were those o Capella as a binary star, while with the twenty-six inch refractor th most important work had been the photographing of the planet Ero during the recent opposition for the determination of the solar paralla The number of hours of bright sunshine recorded during the yea ending April 30, was 1513 out of the 4457 hours the sun was above th horizon.

Patent News.

The following applications for Patents were made between May 20 a May 25, 1901:—

Dark Slides.—No. 10,380. "Improvements in Dark Slides for Photograph Cameras." Percy Wallis.

Stereoscopes.—No. 10,428. "Improvements relating to Stereoscopes, an in Books and Mounts for Stereoscopic Views for use therewith." Com plete specification. Arthur Wellesley Jones.

Apparatus.—No. 10,433. "Improvements in Photographic Apparatus." Jean Frachebourg.

Printing Frames.—No. 10,504. "Improvements in Photographic Printin Frames." William Elliott Debenham.

Photographic Fabrics.—No. 10,524. "Improvements in Photographi Fabrics and Process for preparing Improved Photographic Fabrics." (The Grenier Art Company, United States.) Complete specification Sydney Elliott Page.

Chromo-Collotype.—No. 10,550. "Improvements in Printing Tiles an other Objects by means of Collotype Blocks with Natural Colours, o with other Designs or Patterns and in Apparatus therefor."—Edwar Lee.

Dark Room.—No. 10,574. "An Improved Portable Photographic Dar Room." Karl Ochs.

Rollable Films.—No. 10,610. "Device for rolling up Films in Photo graphic Apparatus, with Means for Locking against Rotation in th direction for Unwinding." (The Photographic Apparatus Manufacturin Company, Limited, formerly R. Huttig & Son, Germany.) Complet specification. Newnham Browne.

MATOGRAPHS.—No. 10,695. "Improvements in and relating to Cinematographs." CLAUDE GRIVOLAS, FILS.

ELOPING COMPOUNDS.—No. 10,721. "The Preparation of new Chemical Compounds, and their use as Developing Means in Photography." (The Farbenfabriken vormals Friedrich Bayer & Co., [Germany) HENRY EDWARD NEWTON.

ERAS. — No. 10,896. "Improvement connected with Photographic Cameras." JOHN WEAVER INNES.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

ne.	Name of Society.	Subject.
0.....	Bradford Photo. Society	Excursion: Apperley Bridge. Leader, W. H. Womersley.
1.....	Birmingham Photo. Society ...	Demonstration: *Survey Methods and Survey Work.* P. T. Deakin and G. Whitehouse.
3.....	London and Provincial	Lecture by A. L. Henderson.
5.....	Borough Polytechnic	Excursion: Leigh-on-Sea. Leader, F. W. Bannister.
5.....	Ealing	Excursion: Battersea Park.
5.....	Hull	Excursion: Burton Stather—Corporation Pier.
5.....	South Manchester	Excursion: Edale and Castleton. Leader, W. J. Pearce.
5.....	Thornton Heath	Excursion: St. Albans. Leader, W. G. Langridge.

ROYAL PHOTOGRAPHIC SOCIETY.

HNICAL Meeting, May 28,—Mr. T. E. Freshwater, F.R.M.S., in the
r.

r. J. R. Gotz showed several specimens of a new lens by Suter, of
. It is constructed on the anastigmatic principle and is a combina-
which is entirely new, not in the outer form but in the composition
he separate elements. The whole is a symmetrical combination
posed of eight glasses, four in each combination. The four glasses
ach combination may be taken as two lenses, each composed of
e glasses, that is to say the two inner glasses and one of the outer
ses perform one set of functions, and other functions are performed
he same two inner glasses and the other outer glass. One produces
ess of field, and the other ensures achromatism and freedom from
gmatism. The principles involved are well known: three lenses of
h one is of higher refractive index than the two enclosing lenses
g combined with other three where the reverse conditions prevail,
a lens of lower refractive index enclosed between two of
er refractive index. The lens works at f - 7.5 and, full aperture, includes an angle of eighty degrees. The refractive ces of the elements are (1) 1,614, (2) 1,521, (3) 1,552 (4) 1,5118.

r. Howard Farmer read a paper upon

PRACTICAL TRICOLOUR PHOTOGRAPHY.

his paper had exclusive reference to the special branch of three-colour k, in which typographic screen blocks are used as the method of ting; it referred also exclusively to the direct method by which en negatives of correct colour values are made direct from the inal. The great obstacles to the adoption of this direct method e been (1) the long necessary exposure, and (2) the spreading, ugh halation in the film, of the screen dots. Both obstacles have n removed, and the paper relates in what way this has been done e first by the use of colour filters of very much enhanced transpar- y and consequent speed, and the second by the employment of ccated plates, to which the author has referred in an earlier paper.

paper, which is lengthy, and deals very fully with practical details well as scientific principles, states that the process is based upon the hings of Professor Clerk Maxwell and Louis Ducos du Hauron, colour filters being substantially identical, as regards the rays they s, with those of Maxwell, although his solutions are not employed ause in two cases they are unsuitable, and in the third the slightest ration of the strength of the copper chloride solution materially rs the absorption. Liquid filters are employed, and choice is given to rganic salts in preference to dyes as being more constant in their position and colour absorption. The formulæ for the colour filters e given and their use was fully gone into. For the yellow printing ative Mawson's lantern plate is used. This is the negative that is made, the image being focussed with a glass cell containing the per solution in position behind the lens, a Levy screen, with its s at angles of fifteen and seventy-five degrees, respectively, from base, being placed at a suitable distance from the sensitive film. the majority of copies the author finds that a screen distance of inch combined with a 133 line ruling, and an aperture of f-45 is suited. The plate is heated on an electric heater at about 220 rees Fahr. for a couple of minutes, and is then coated with Avery's king, one part to one of water, which dries at once. It is then ex- ed and developed with the maker's formula in a more concentrated n. The crimson printing negative is made on a Lumière, series A, e, the solution for the yellow negative being replaced by that for crimson negative. No refocussing is required, but the Levy screen is turned so that its rulings are now seventy-five and fifteen degrees, respectively, from the base. The screen distance remains the same, but the stop is altered so that its sides diagonally cross the screen rulings. The plate is desiccated and backed precisely as before. The blue printing negative is then made, another ruled screen with its rulings at forty-five degrees being used, the screen distance and stop remaining the same, although the position of the latter is modified. The series B, Lumière plate, desiccated and backed, is employed for this negative. The three negatives being deemed satisfactory, the operations of reducing, &c., are performed. For reducing, the iodine and cyanide formula is employed, and the images are treated until the smallest shadow dots begin to disappear. This done, after washing, they are ready for intensification, which is done by means of the lead formula, commonly used with wet plates. The blocks for tricolour printing are made in much the same way as for ordinary monotone subjects, and only an outline of the process is given in the paper. The etching of the blocks and the proving both in black and in colour is also described.

Mr. Howard Farmer then read a paper upon

THE OPTICS OF TRICOLOUR PHOTOGRAPHY,

in support of his contention that the true principles of tricolour photography are those given to us by Professor Clerk Maxwell, and not those advocated by Mr. F. E. Ives. After a brief historical review, it was remarked that Baron Hübl had already shown that the methods of Du Hauron, Cros, and Vogel are in practice substantially the same, and that the author has shown that these methods are in their turn also substantially identical with Maxwell's. He, therefore, proceeds to compare with the latter Mr. Ives' practice, dividing the examination into two sections, (1) the two systems of analysis, and (2) the two systems of synthesis. Visual, spectroscopic and camera tests of the Ives' filters and Maxwell's three solutions were made, and as a result he is convinced that Mr. Ives' practice does not conform to his teachings. The same may be said of Mr. Sanger Shepherd's filters. Mr. Shepherd, it is presupposed, supports the teachings of Ives, but, again, in the tests of his analysis filters no evidence in their spectrum records in support of Ives, or to suggest the Maxwell curves, is found; on the contrary, they give practically identical records as those given by Maxwell's three solutions. So with the American Carbutt filters. To sum up these tests the author thinks it impossible to conceive anything more directly opposed to the tenets of his teaching than Mr. Ives' practice, as exemplified by his analysis filters and synthetical glasses. In departing from his own teaching he has adopted that of Maxwell originally indicated in 1861.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 30,—Mr. S. H. Fry in the chair.

Some discussion took place respecting the magnesia cylinder brought up by Mr. J. E. Hodd and tested at the last meeting in the lantern.

Mr. Haddon said that the one he took was used after five days, during which time no special precautions were taken to preserve it. It behaved decently and cracked a very little, but not more than an ordinary lime cylinder would. The light, too, was decent, and it certainly had one advantage over the lime which would not withstand exposure to atmosphere, whereas the magnesia cylinder would. It was somewhat yellowish colour before use, but where the flame impinged it became white.

Mr. T. E. Freshwater said he had tried a sample and found that the atmosphere had no ill-effect upon it in the space of a week. The cylinder was very yellow, and under the heavy pressure of a mixed jet it threw off a great number of small particles. There was no pitting, but a continuous dispersion of particles. After use it had a very yellow colour, whether due to the colour of the cylinder in the first place, or to impurities in the coal-gas used with the oxygen, he could not say. Of course, it was well known that this gas, while in bottle, did get very impure, and often the light was very detrimentally affected.

Mr. J. E. Hodd said that from his own observations it might be added that the cylinder did not behave at all badly. There were no miraculous properties claimed for it; only that it gave a good light and stood the atmosphere so well.

Mr. Freshwater said that he had not compared the magnesia with the lime cylinder, but he expected that the former would not become so perfectly incandescent as the lime.

Mr. Heskins passed round an old carte-de-visite portrait, drawing attention to the fact that the name of the photographer was A. L. Henderson.

Mr. Henderson who was present said that it must have been taken twenty-five or thirty years before. There was no sign of deterioration, the colour and vigour being probably as good as ever. It had been embossed and tinted, and was an albumenised paper print, toned with the acetate bath.

Mr. Walter D. Welford said he had heard a great deal about unequal stretching or contraction with stripping films, but to show that it need not be so, he passed round a panoramic view of four films on Thornton film. Prints from these negatives had been made and matched one with another, producing a complete view that he thought joined up as well as would prints from glass negatives.

Mr. A. Haddon read a paper upon the

ACTION OF HYDROCYANIC ACID UPON FINELY DIVIDED METALLIC SILVER.

This paper was written and the series of experiments performed in order to meet and dispose of a statement made by Mr. A. L. Henderson last autumn, that a silver image exposed to the vapour of cyanide of potassium was caused to disappear. At the outset Mr. Haddon re-

peated the fact that chemists were as yet quite unaware of the existence of any silver compound that was volatile at the ordinary temperature of the atmosphere. When Mr. Henderson made the assertion that involved the contrary in October last, Mr. Haddon was convinced that there was some mistake, and the experiments he had since conducted and now related proved the correctness of his opinion. An image composed of silver in gelatine on glass was soaked in water and placed on a vessel containing a twenty per cent. solution of cyanide of potassium. The glass plate was so placed that air had free access to the vessel. A change soon took place, the silver assuming a metallic appearance. The film was remoistened twice, as no action took place upon the dry film, and ultimately the effect of the fumes of cyanide of potassium was to render the silver entirely invisible. The plate was then soaked three separate times in distilled water, the wash water being transferred to a test tube where the addition of hydrochloric acid clearly demonstrated the presence of silver which was thrown down in the form of chloride. Mr. Haddon could not recommend the method as one suitable for the reduction of density or getting rid of green fog, as had been suggested. Hydrocyanic acid gas is formed which must escape and reach the lungs. An exceedingly dangerous gas like this, even in its dilute form, should never be wantonly played with. Mr. Haddon went fully into the chemistry of the process, showing the formation of hydrocyanic acid, by the action of carbonic acid upon the cyanide, to be the active agent upon the finely divided silver in the gelatine film.

PHOTOGRAPHIC CLUB.

MAY 29,—Mr. E. A. Newell in the chair.

Various matters of current photographic interest were discussed, and amongst them the practice of enlarging direct upon carbon tissue, which it was understood some firms did. The comparative advantages of this and the usual direct printing from enlarged negatives were gone into; and the merits of large versus small carbon prints, on the suggestion that the former did not look so nice as smaller prints, was also touched upon.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PRICE CUTTING AND THE KODAK CO.'S POLICY.

To the EDITORS.

GENTLEMEN,—One of the greatest difficulties that manufacturers in every trade have to contend with is the question of price cutting. In the book trade, at one time, price cutting was very prevalent. Now, many books are published at net prices, and the booksellers are not permitted to allow discounts on books so published. Of course, if the book proves a failure at the original published price, the booksellers do after a reasonable period has elapsed, considerably reduce the price. What constitutes a reasonable period is a matter the publisher, the author, and the bookseller may settle between them. In the cycle trade, price cutting goes on merrily, particularly in regard to sundries, and the smaller agent suffers accordingly. The manufacturers are, however, endeavouring to grapple with the problem; but it is not an easy matter to do so. In the photographic industry the cutter of prices is certainly not unknown. So far, however, the manufacturers have succeeded in protecting the smaller dealer by prohibiting the large dealers, or any dealer, from selling their goods below a certain price. This policy has been criticised; some question its legality. Take the matter of plates and papers: the members of the Plate and Paper Manufacturers' Association have agreed on certain uniform prices, and the dealers are unable to retail those goods supplied by the various members of that Association at prices below the recognised standard. It is fairly obvious that the ordinary consumer does not necessarily suffer from any such agreement amongst manufacturers who are producing a practically identical article. It is highly desirable that photographic plates and papers should be of the best possible standard, and if by any possibility an era of price cutting were started, the tendency would be for the plates and papers to deteriorate in quality, reference being made to the case of several manufacturers selling a practically identical article. That, of course, does not settle the point as to whether the dealer should be allowed to sell photographic plates and papers at whatever prices he liked. No doubt there are many large dealers who would be prepared to sell those particular goods at a smaller profit, and it might, and doubtless would, pay the large dealer to do so, for naturally his turnover would increase. The small dealers throughout the country could not afford to reduce the price, and if dealers generally were allowed to charge their own prices for those goods at present sold at fixed prices, the result would be that many small dealers would not consider it worth their while to stock them. Many large dealers will say, "So much the better." Obviously, it is to the manufacturer's advantage to ha as many dealers selling his goods as possible, and, on the whole, is probably to the consumers' benefit also. At present, the sm dealer is almost on an equal footing with the large dealer, and t consumer is able to obtain the standard makes of plates and pape practically anywhere. It is desirable and convenient that it shou be so.

There is another aspect to this interesting subject which will co into greater prominence in respect of roll film. The Kodak Compa have threatened to open the flood-gate of price cutting if they fi they are unable to effect their recently imposed policy of prohibiti dealers handling any other manufacturer's make of roll film, so lo as the dealer is an agent for the Kodak Company's goods. It ridiculous to assume that the Kodak Company is supplying deale throughout the country with their goods purely for the benefit the dealer. The Kodak Company would hardly claim to be phila thropists. As has been remarked above, it is obviously to t manufacturers' advantage to have as many agents as possible. Peop frequently purchase goods when they see them, whereas they cou hardly do so if they know nothing about them. But dealers wou not go out of their way to exhibit any particular manufacturer's goo unless it was to the dealer's advantage. If the Kodak Company car out their threat they will probably be the greatest sufferers. B they may be compelled to reduce their prices to meet competitio The point the writer wishes to emphasise is this. In the eyes of t Kodak Company any manufacturer who places on the market a efficient roll film, and sells it at a less price than that sold by t Kodak Company, is a price cutter. Surely it needs no pointing o that the cost of production may be less, and the manufacturer al may be content with less profit. If the home-manufactured artic is not worth purchasing, the manufacturers will soon learn that is not worth while producing it. The reports are, however, ver favourable.

The question of public convenience does not seem to enter into t Kodak Company's philosophy. They are good enough to say tha while they are monopolising the ordinary channels of distributio other manufacturers of similar goods may resort to the Post Offic and trade direct to the customer. If the dealers generally intend t sell their commercial souls to a company which is hardly much mo than a wholesale agency for the supply of American goods, they ma some day be disillusioned. The public does not exist merely for th benefit of the dealers. If the public want Kodak goods they will n doubt get them readily enough; but there can be no particular virtu in purchasing American goods, if we can obtain English manufacture articles just as efficient, as convenient, and as moderate in price Almost without a protest many English dealers have allowed them selves to become domineered by a company of American origin, whic has adopted characteristic American methods; and, for a time, th anti-British policy may pay. But already many influential custome have closed their accounts with those dealers who have agreed t adopt the Kodak Company's restrictive policy, and it is quite evide that a large number of photographers are quite ready to support t home-manufactured article.—I am, yours, &c., J. A. REID.

June 3, 1901.

RE KODAK COERCION.

To the EDITORS.

GENTLEMEN,—I enclose a copy of a resolution which, at the l meeting of the Gospel Oak Photographic Society, was unanimou adopted. I trust you may be able to notice the same in your ne issue.—I am, yours, &c., HENRY BILLINGSLEY.

6, Burghley-road, Kentish Town, London, N.W., June 3, 1901.

"That the Gospel Oak Photographic Society, whilst fully reco nising the services rendered by Kodak, Limited, to photographers, d plores the threatened importation into this country of methods trading opposed to British ideas of fair play, and can only regar the company's action as an attempt to establish an injurious monopoly.

The following letter, dated May 22, which is published in t "Deutsche Photographen Zeitung," has been sent by the Deutsch Gesellschaft von Freunden der Photographie, so we are informed, t all German photographic societies:—

"To the Photographic Societies in Germany.—

"The undersigned, Deutsche Gesellschaft von Freunden d Photographie, take the liberty to direct the attention of their kindre societies to a subject which was dealt with at their meeting of t 13th inst., and which refers to the business methods of the Koda Company, which have already given rise to complaints. What is t happen to the German business of the company is to be seen fro its procedure in England, where dealers are simply interdicted fro dealing with other rollable films and roll film cameras than those the company, in default whereof further supplies are to be refused.

"Since free competition, and with it the technical advance of phot

aphy, will be hampered by such a monopolising rule, it becomes e business of all circles interested in photography to take up a sition of opposition against a company with such principles. In ıgland the procedure of the company has raised a storm of protests, ɔm the side of the dealer, as well as from a number of societies, ıich are principally composed of amateurs, which have passed pro-ɜting and boycotting resolutions, as well as by a Free Camera Club, ecially formed for protesting, which has already collected 3000 otests, and has also circulated 40,500 protest cards.

"That the company will follow similar lines in Germany is obvious, that they have for some time promised an increased discount to ose dealers who promised (in writing) to deal with no competitive ınufactures. Moreover, Herr Ottomar Anschütz has stated that e Kodak Company have refused to supply him with goods for the st 1½ years, on the basis that he favoured in his establishment erman productions. If, indeed, we willingly concede the rights of ıspitality to foreign firms, it is yet unheard of that such a firm ould have the presumption to wish to deny to German dealers the ght to prefer German wares.

"All these incidents, as well as the complaints, which are becoming ıder, from the meetings, especially as to the occurrence of defec-ve supply, for example, in the supplying of films joined up of pieces, ıused the Deutsche Gesellschaft von Freunden der Photographie to me unanimously to the following resolution:

"'In the face of complaints, which have become loud in amateur rcles as to the action of the Kodak Company, which have been in-nsified by the boycotting of a respected German house by the com-ıny, and in the face of the procedure of the Kodak Company in ıgland in boycotting all dealers who deal with other manufacturers, e Deutsche Gesellschaft von Freunden der Photographie resolved to rect attention as regards the use of rollable films and rollable film meras, in the first place, to the German productions, and to bring to ıblic notice all cases of presumption on the part of the Kodak ɔmpany.'

"We request, in the interest of the free development of photo-aphic technique and home industry, all kindred societies to adopt is resolution, and to kindly communicate the fact to the under-gned.—President, Herr Direktor Schultz-Henke, Berlin, Königgrätzer rasse 90."

RE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—In face of Rule 3, is the above title quite correct? ould it not be more exact to name it the "Master Photographers' ssociation." As the Association does not propose to admit profes-ɔnal photographers, unless they are masters or managers, I do not e how the proposed title can be maintained.—I am, yours, &c.,

H. J. BURTON.

Southfield End, Uxbridge-road, Hanwell, London, W., June 3, 1901.

THE RAGGED SCHOOL UNION AND PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I think that a good study for a photograph would ɔ the face of a little slum child on its first sight of the sea. And ɜt I doubt whether even the faithful work of the camera could catch l the mingled expressions of wonder, delight, awe, and a dozen other elings which the scene brings up. There are thousands of slum ıildren who would never see the sea but for the help of some such stitution as the Ragged School Union, which sends away each year me thousands of poor children to its holiday homes at Bournemouth, ɔuthend, Margate, &c. I venture to appeal to your readers on ehalf of this work. The photographer, I imagine, has a special love r the beauties of nature, and will therefore feel all the greater sym-ıthy for these stunted, starved, little souls whose horizon is too often ɔunded by dingy bricks and mortar. The cost of a fortnight's holi-ıy by the sea is only 10s. per child, a small amount which can ve untold delight to some little gutter-child. I shall be grateful ɔ receive and acknowledge all subscriptions that are sent to me.—I n, yours, &c.,

JOHN KIRK.

32, John-street, Theobald's-road, London, W.C., May 29, 1901.

SCREENS FOR THE McDONOUGH-JOLY PROCESS.

To the EDITORS.

GENTLEMEN,—I have been much interested in the series of articles your magazine concerning the development of the various methods colour-photography, especially as regards the Joly-McDonough ree-film process.

It has occurred to me that in the manufacture of screens for ex-erimental work, advantage might be taken of the Lumiere, or of the Sanger Shepherd three-film process. Suppose, for example, that a number of black and white lines are drawn accurately parallel, and such that the black lines are double the width of the white ones. A reduced negative could be made from such a chart, giving lines of almost any width desired.

Now if this negative were used to produce a positive upon bi-chromated gelatine, this positive could be coloured any desired tint after washing with warm water, and we should have a single set of colour lines of the desired fineness.

If this positive were varnished, and again coated with gelatine, a second set of lines could be produced and coloured with a different tint. In this way, it seems to me, that a very perfect taking or view-ing-screen could be made without serious expense, and if there is any variation required between the taking and viewing-screens, it would be easy to experiment in this line.

By the method used by Professor Wood in making large copies from small gratings, screens of any size could be made.

Of course, for practical purposes, the machine-ruled screens that have now been perfected by the International Colour Photo Co. will be undoubtedly much cheaper, but they allow the individual no opportunity for experimentation, and leave him in doubt as to whether variation of the colours chosen might not be an important factor in the process.—I am, yours, &c.,

J. S. SHEARER.

Ithaca, N.Y., May 14, 1901.

IS THE STEREOSCOPE LOOMING IN THE DISTANCE?

To the EDITORS.

GENTLEMEN,—At the meeting of the Croydon Camera Club, on 22nd ult., when the "Hand Camera of To-day" was exhibited and described by a number of its members—and, of course, everyone has his pet camera, and can point out its (to him) advantages over all others—a notable feature, as I gather from the report, was that a considerable portion of the hand cameras shown were available for stereoscopic photographs, while others were really designed as stereoscopic hand cameras. One of them, which was much admired on account of its compactness, was of the exhibitor's own design and workmanship. On former occasions you have called attention to the fact that there is no reason why a stereoscopic hand camera should be but a little more in bulk than a quarter-plate one, seeing that shorter focus lenses are used for the former than for the latter. A slight modification in some of the panoramic cameras recently put upon the market would adapt them well for stereoscopic purposes, and they would be light and portable enough to suit any one. Another noteworthy thing about the hand cameras shown at the Croydon Club's meeting is that the larger proportion of them were of British design and manufacture.—I am, yours, &c.,

BINOCULAR.

June 2, 1901.

COLLODION *V.* GELATINE NEGATIVES.

To the EDITORS.

GENTLEMEN,—I have read "Old Professional's" letter on collodion v. gelatine negatives, and I must say that I have found troubles arising from stains in old collodion, as well as in old gelatine plates. However, I have less experience in collodion ones, having got rid of them long ago, retaining only a few of them, while I have a quantity of gelatine negatives on hand showing yellow stain after from ten to twenty years. It is admitted that this yellow stain is a remnant of hypo in the film which has not been well washed out. If it were actually so, I do not think that the trouble would be very great in after use of these negatives, as this stain would, or should, be uniform all over. But I never found this to be the case. The stain, as there I may say, invariably has its beginning at one corner and spreading more or less towards and over the centre of the plate, sometimes more one side or the other of the plate, and never covering the whole plate, but generally from half to three-quarters of it, leaving some parts perfectly clear, and the stain itself is uneven yellow, in some part or parts deep yellow, gradually fading away. Sometimes, but very rarely, this stain happens in the centre. I have used alum baths for plates, and have not for others, and found no difference in their keeping qualities later on. I have washed the plates always very carefully for one hour or more in running water in a grooved tin box, or sometimes for about the same time under a spray of water, the plate lying flat under it. Of course, I have never made any memorandum about the washing of any special plate, but the stains are so uniformly on the same place that something else but hypo must be the troubling agent there; maybe the draining of the plate when set up to dry may have something to do with it. Some time ago, I think, you mentioned a party that could restore such negatives. Is it true? Can the materials for it be bought, or is it no more a secret? I think the party wanted at that time negatives sent to him. —I am, yours, &c.,

A. LEVY.

Asnières (Seine), May 31, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

H. M. Cooper, 29, East-street, Taunton. *Photograph of horse falling over a bank.*

E. B. Mowll, 174, Broad-street, Birmingham. *Two photographs of Rev. Dr. W. T. Davison, D.D.*

A. B. Legard, "Sunningdale," Bexley, Kent. *Photograph of the reception of Major Phipps-Hornby, V.C.*

Miss M. E. Hargreaves, The Studio, Fern Lea, Coniston, Lancs. *Three photographs of the Ruskin Monument.*

AN AMATEUR TURNING PROFESSIONAL.—"GAMBER" writes: "I am an amateur photographer, but wish to take up the business as a profession. Can you advise me how to proceed to get a thorough training and insight in photography? Do the large first-class firms take pupils or students under indentures of apprenticeship?"—In reply: Some professionals do take articled pupils and apprentices. You will frequently see advertisements to that effect in our advertisement columns. Consult them from week to week.

MAKING A BOX ON WHEELS.—H. F. writes: "Could you give me any information as to the way to have a box made on wheels to work the dry ferrotype on the sands?"—In reply: The only suggestion we can make is for you to design a box that will suit your requirements, and then get a local carpenter to construct it for you. Possibly one or other of the old forms of outdoor tents for working the wet collodion process would answer your purpose, and, no doubt, one or more may be had cheap by advertising for what you want.

COPYRIGHT.—"SEPTIMUS" writes: "I find that a portrait I took of our clergyman some time ago, has been sent by one of the congregation, with a certain number of coupons to an advertising firm, and a number of copies obtained. The portrait I took without charge, and, with the sanction of the clergyman, made copyright. Have I any remedy, and, if so, against whom?"—In reply: Certainly you have a remedy in an action for damages, against the firm who made the copies, which we should advise you to prosecute without delay.

ENGAGEMENT.—"OPERATOR" says: "Five weeks' ago I made an engagement with Mr. ———, of ———, for a season engagement, if I would go for a month on trial. I went, he paying my railway fare from London. At the end of three weeks he simply told me I did not suit, and I find he has engaged another man. Can I not compel him to pay me a month's wages in lieu of a month's notice?"—In reply: No, because you went on a month's trial, and your work evidently did not give satisfaction. Your actual engagement was only for a month, and it terminated at the end of it.

SOUTH LIGHT IN STUDIO.—J. W. writes: "I am wishful of opening a business in this town, and I can get excellent premises in the best business street, but I can only build the studio so that it faces the south. Do you think it possible with a studio with that aspect to get good portraits?"—In reply: Yes, certainly, and a greater variety of lighting than in a studio with any other aspect. But it should be borne in mind that a south lighted studio requires great skill on the part of the operator to work it successfully. It may be mentioned that some of Mr. Valentine Blanchard's best pictures were taken in a south-lighted studio.

STUDIO.—W. W. W. says: "I have bought the freehold of one of a new row of shops, and am putting up a studio in the garden, the plans having been approved of by the district council. My next door neighbour says he will make me take it down as it will cause him annoyance by my sitters over-looking his premises. Can he do so?"—In reply: No, he certainly cannot, as you have the right to put up anything you like on your own premises. But your neighbour has an equal right to put up anything he likes on his. He can, if he chooses, put up a high wall, or hoarding, so as to block off the view of his premises and thus stop off much of your sidelight, and you cannot prevent him doing it.

POWDERY DEPOSIT ON NEGATIVES.—"AMSET" writes: "Lately I have been troubled frequently by a powdery deposit on my negatives, Can you suggest the probable cause of it? It is not dust; can it be anything in the water? The enclosed negative was intensified by Monckhoven's process. It was washed before fixing, and in running water for half-an-hour after fixing; again for half-an-hour after the mercury bath, and again for the same time after the silver bath. This deposit seems to me to appear more often on negatives that have been intensified than on others."—In reply: The deposit seems to be due to particles of foreign matter settling on the film. If it is not dust; it is probably particles of iron in the water. Try filtering that.

SUN IN STUDIO. — "YORKS." — One of the best ways of temporar stopping the sun out of the studio, during the summer mont is to stipple over the glass with starch, or flour paste to whic little whiting has been added. Then when the sun gets low in t autumn it can be cleaned off with sponge and water.

SPOTS ON PRINTS.—T. DUCE sends some prints with a number of bl spots upon them and wants to know the cause. He says his wa supply comes for a long distance through an iron pipe, and so times the water, if left long standing in a glass measure, ha sediment like iron rust. He asks "if we think this may h something to do with the spots?"—In reply: We certainly do, particles of iron in the washing water, before the prints are ton would produce similar spots. We should advise our correspond to let the tap run for five or ten minutes before the water required for use, so as to wash out the pipe. Then to tie two three thicknesses of fine flannel over the tap so as to filter the wa before using it. It will then, probably, be all right.

THE STOPPAGE OF WAGES.—"TUESDAY" asks: "Will you kindly info me if my employer can legally stop a day's pay for arriving hour late to business? The circumstances are as follows: arrived an hour late to business this morning, Tuesday, owing a long railway journey. I apologised and stated the cause of it, b my employer would not let me commence work until to-morro Wednesday. I am paid a weekly salary, and have no doubt pay will be stopped."—Your employer's treatment was, to say t least of it, very arbitrary. As you were not there at the pro time, and you did not do the day's work, we are a little doubt if you can recover the day's pay. Anyhow, if you were to try enforce it it is probable that your arbitrary employer would gi you notice to leave. All things considered, we think you wou perhaps, do better if you submitted to the loss.

FLASHLIGHT PHOTOGRAPHY.—"CONSTANT READER" writes: "Will y please recommend the best method of taking a flashlight pho graph of an evening garden party on a small lawn? (1) Wou a single flash of powder be sufficient? (2) What quantity wou be safe to use? (3) And the best way to light the said po der?"—In reply: It would be better to have two, one about doub the other. (2) That will entirely depend upon the space to illumined, and the distance the light is from the party; the ap ture of the lens employed, and the rapidity of the plates use Beyond saying that we can give no more definite informatio You had better make a preliminary experiment or two before t evening of the party. (3) If magnesium powder be used it h better be projected through the flame of burning spirit. If any the explosive flashlight powders be used they may be ignited a vesta fusee.

INTENSIFICATION AND DEVELOPMENT.—F. E. J. writes: "Having h occasion the other day to intensify a portrait negative, I made the following copper solution — sulphate of copper 30 grain potassium bromide 30 grains, water 3 ounces, and after bleachi the negative in the above solution, I thoroughly washed it a redeveloped it with an ortol-soda developer (equal parts of eac After redeveloping it, I washed it in water and left it there. Abo five minutes afterwards, I went to take it out of the water, a was surprised to find a red stain all over it, which gradua turned a darker red. (2) Please give me a formula for a go concentrated single solution ortol developer, and how to conti over and under exposure with same? (3) Please also give formu for a good developer for portrait negatives?"—In reply: (1) In probability the negative was not sufficiently washed before redeveloper was applied. The plate should be thoroughly wash between the operations, and the redeveloper an old one that been used several times. (2) It is better to have the developer two solutions. Over-exposure is controlled by the use of m bromide, and under-exposure by the more liberal use of the alk (3) Any of the formulæ issued by the makers of the plates will as well for portraits as for landscapes. No special formula necessary for portraits.

A QUESTION OF OWNERSHIP.—"15 BY 12 NEGATIVE" writes: "For upwar of twenty-five years I have been doing work for a large engineeri firm, and until recently held about 600 15 by 12 negatives. I w paid £1 for the first negative, and 10s. for each additional negati taken on the same day. Cab hires were also allowed, and prin were charged 2s. 3d. each, unmounted. Invoices were sent as ov To first negative, 15 by 12 size, £1; to second negative, 15 by size, 10s., and so on. My clients now allege that the negatives a their property as they have paid for them, and sent to remo them, and, unfortunately, I allowed the negatives to be taken awa Now, what I want to ask is—(1) Do the negatives belong to m clients or to me? (2) If belonging to me what would be a reasonab charge to make for each? I may add no agreement was enter into at any time, verbal or otherwise, that the negatives were be the client's property, and I have stored them all those yea and paid a heavy insurance premium each year to cover the risk loss through fire."—In reply: (1) The negatives are undoubtedly yo property, that point has been settled over and over again, and y did very unwisely in giving them up. (2) As you have parted wi them we fear that you will have some little trouble in recoveri their value. As to price, as you have parted with them, we shou say make the best terms you can. You might put in a claim, sa for seven and sixpence to ten shillings per negative, which wou be fair, under the circumstances.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

e German otographic nvention.

The old town of Weimar, capital of the grand-duchy of Saxe-Weimar, will this year be the centre of the Convention of German ofessional Photographers. The meeting will be d from the 12th to the 16th August, under patronage of the Grand Duke of Saxony. The Deutscher Photographen Verein" has entered on the twenty-fifth year of its existence, and from modest number of thirty-five members at its foundation, s increased its roll to 844 members, and become an organtion of considerable importance. The Convention apars to have been organized with considerable care. ckets will be issued to members of the Verein for £1, and non-members for £1 5s., which entitle the holders to rticipation in the following programme:—August 13. nner at noon at the Sächsischer Hof; excursion to Berka 3 p.m., returning at 9.15 p.m.; supper at the Kurhaus, rka, at 7.30 p.m. August 14. Dinner at 1 o'clock at the otel Chemnitius; visits to places of interest in the town; nvention supper at the "Erholung" (without wine), at 7.30 p.m. August 15. Trip to Jena, at 7.45 a.m., returning at 11 p.m.; visit to the Jena glass works, at 9 a.m.; dinner at the "Sonne," at noon; visit to the Carl Zeiss optical works, at 2 p.m.; supper at the "Sonne," at 8 p.m. August 16. Dinner at 1 p.m. The exhibition organized by the Verein will be held at the Baugewerkenschule, Herderplatz, and will remain open till the 26th August. A considerable number of medals and prizes are offered for competition, including a silver cup of the value of £15, with silver medal for the best exhibit of portraits, also various lenses, cameras, &c., by some of the best houses in the trade. The editor of the "Deutsche Photographen Zeitung," Herr K. Schwier, informs us that English visitors will have a hearty welcome at the Convention. Further particulars may be obtained by letter from him at 4, Sophienstrasse, Weimar.

* * *

Photography in Natural Colours.

Once again we have had the announcement in the daily press, that the wonderful discovery has at last been made of photographing in natural colours. On this occasion the startling news comes from Switzerland. Herr Adolph Gurtner, of Bern, an amateur, who has devoted all his spare time for many years to the solution of the problem, has at last succeeded. Of course the statement also refers to the great sacrifices, pecuniary and otherwise, which he has made, and it is accompanied by the remark that he is unable to give particulars of the interesting process until he has protected it by patent. According to the "Berner Bund," Gurtner recently succeeded in producing some transparencies in colours from pictures. He then repeated his experiments by photographing objects of nature. These were successful, and he now has a large collection of photographs in colours printed upon ordinary gelatino-chloride paper. We are not surprised to learn that the process is marvellously simple, that only one plate is used for the exposure, and that development and fixing are carried out in the usual way, the only difference being the interpolation of one simple process with a single solution. Certain precautions must, however, be observed in making the exposure, and success primarily depends upon its correctness. When the negative has been secured, any number of prints upon paper or glass may be

made. The "Berner Bund" vouches for the unsurpassed beauty of Gurtner's results. If Herr Gurtner has succeeded in devising a new method of photographing in natural colours and the results are of extraordinary merit, we shall be ready to give him full credit for the invention, but at present the news has all the characteristics of the discredited processes of the past, and we fear it will be relegated to the same places as the so-called inventions of Chassagne and Bennetto.

* * *

The Permanence of Glossy Surfaces. There is no doubt that a very large section of the public have a decided leaning for a highly glazed surface in photography. Especially is this the case in portraiture: long before the introduction of gelatino-chloride or emulsion printing papers, the rage for enamelled surfaces existed. At that distant date the printing mediums were either plain salted or single albumenised silvered paper, and as the demand for highly-glazed surfaces increased on the part of the public, manufacturers were not slow to cater for what was demanded, and soon the single albumenised paper had to give way for a sample known as double albumenised, by reason of the fact that it could be made to yield a very much higher gloss in burnishing than was possible by the earlier samples of this class of paper, Unfortunately, however, with the introduction of these double albumenised samples of paper, there entered into photography what has proved to be a serious matter in regard to the permanency of prints yielded by their agency. It would perhaps be going too far to assert that all professional photographers rushed madly after this new innovation in printing material, no doubt there were those who questioned the advisability of resorting to the use of such a medium for printing purposes; but the public eagerly grasped at the apparently elegant finish displayed by prints produced on the double albumenised sample of paper, and, as a consequence, they had to yield to the wishes of their customers. This, unfortunately, has proved to be a step in the wrong direction, for there is little doubt with the introduction of double albumenised samples of printing, a sad lack of permanency was introduced, and there are still living those who can remember well the exceptions that were taken at the time against the indiscriminate use of such highly glazed papers by reason of their liability to yield less permanent results than the earlier single samples of paper. Highly glazed surfaces, however, had to be provided, and as one firm cut down prices to a lower level than another, prints of the desired kind had to be turned out at the lowest possible cost, thereby introducing another factor in a retrograde step as regards permanency, for in many cases it was undoubtedly true, that insufficiency in washing and other neglect in the treatment of the papers, only aggravated the liability of such photographs to fade. This want of permanency soon became apparent, and the best photographers at once realised the necessity of producing their highly-enamelled surfaces by other means than the burnishing of these samples of paper, and hence recourse was had to enamelling single albumenised samples — a method of printing in silver and finishing that produces the most exalted degree of enamel and which is without a rival at the present day, for when the process is carefully conducted silver printing may be said to be absolutely permanent. At any rate, we have, whilst penning these lines, immediately before us large numbers of prints on single albumenised samples of paper, finished by being enamelled by collodion, which are as superbly perfect as they were the day they were stripped from t enamelling glasses, now over twenty-five years ago. striking contrast to these beautiful productions, there wise are before us nurmerous examples of work execute various high-class firms during the last decade, and truly pitiful to behold the fading and collapse such mani

* * *

The Public and the Process. Professional photographers have du recent years, no doubt, experienced much of this lack of permanency in the work they l turned out, and not a few of those whose reputation has at stake have been forced to discard the use of such quest able paper as gelatino-chloride and double albumen samples, and in their eagerness to obtain a perma printing medium, have had to resort to carbon, platinotyp collodio-chloride; whilst, strange to say, but few, if an any, of them have given a moment's thought to the beau as well as permanent results obtainable by the use of c dion as an enamelling medium. No doubt the public to blame themselves for the miserable condition in w much of the work turned out during the last decade arrived at, for they readily yielded their orders into hands of second or third-rate photographers, who cared straw for the after results, their object being to turn as rapidly and cheaply as they could the most hig enamelled proofs possible, and in this matter they der exactly what they wanted from the employment of gelat chloride papers, which, no doubt, produce a surface and for the time being which quite satisfied a public whose aim was to get, as they thought, a good thing at a low pr At the present day any one has not far to seek for this upon the utility of photography, as the best recording age mankind possesses. We see it only too apparent in alm every household, and what is perhaps worse in every w house or business centre, where some photograph has taken in the past to illustrate some desired event or i connected with the business in question. It is the s story, "fading away," and so pronounced has this d become that not a few managers of large concerns are serio turning their faces against photography, simply by re of this lack of permanency. One striking instance of kind has quite recently come under our notice, in which details of a machine photographed only ten years ago entirely disappeared, and seeing the machine in questio been destroyed by fire, and the photograph was require proof in a law case, the chagrin is considerable on the of those who relied upon the photograph as a record undoubted proof.

* * *

The Effects of Impermanence. This question of permanency is fast coming a matter of the greatest mo to professional workers, and the sooner they realise vast importance attached to the work they are called upo produce and the necessity of turning out permanent res the better will it be for all concerned in photography. no period in the history of our science has there been a marvellous development as perhaps during the last dec and not the least striking item in this progress has the application of photography in illustration of books periodicals. Here, again, alas! it is not difficult to find si witnesses in proof of the non-permanence of some of earlier methods of embellishment employed, such as

ion of bromide prints. In contrast to the appearance e old-time engravings, printed by means of engraver's what a sorry figure do some of these mechanically ed and developed pictures cut! Fortunately but little is work exists to cast a stain upon the permanency of graphy, for permanent ink printing soon displaced nethod of illustrating books and periodicals, and now alf-tone block and kindred process productions have ed in to save, in a sense, the reputation of our craft in lass of work. There, however, is also a vast amount rk in evidence at the present day, work that dates back for a few years, which casts a slur upon photography permanent method of depicting the scenes or subjects it een utilised for, and which in many instances twenty- ears hence will have entirely faded from view. To therefore, is this serious condition of things attribut- is a question which it behoves every photographer to er well over. That a silver print is sure to fade sooner ter is a statement often made by those who set their against it in every shape or form as a printing m, and yet silver prints are to be seen by thousands have been produced from the earliest days of printing, hich are at the present moment standing evidence of the y of such an assertion. A lack of permanency would r to have intervened with the discarding of single enised paper, and all down along the line ever since, the introduction of the more highly glazed samples of , has become more pronounced. In a great measure y and careless manipulation of these papers accounts or this lack of permanency, but to condemn silver in shape or form is going too far. During the last two es it may be said photography has discarded many of rliest methods, and we have been adopting gelatine ny instances where previously collodion was employed, vith the adoption of gelatine, both in negative and ve work, there is no doubt much has been introduced e way of lack of permanency, for even in our negatives e the same deterioration manifested, as a gelatine ive may fade and become useless, whilst all our good ions are as sound as the day they were made, long e gelatine was thought of.

* * *

a for dio-chloride.

If the public will have a highly glazed surface for their portraits then collo- n some shape or form ought to be utilised, and photo- ers should impress upon their customers that if their es are to be permanent they must be prepared to face tra cost of producing them on material capable of yield- ch results. But few photographers having a regard for reputation will be found who are not keenly alive to portance of this question, for sooner or later the state- that So-and-so's pictures never fade is a recommendation amount importance, and probably with silver print- here highly glazed surfaces are required, the greatest t of permanency will be obtained by the employment odio-chloride samples of paper, or a return to the good ctice of enamelling a thoroughly well fixed and washed e of single albumenised paper. It has been said that uestion of deterioration enters likewise into the nega- as well as the positive use of gelatine, and, no doubt, also a fact clearly demonstrable by those whose ex- ce carries them back to the early days of collodion g; but it is not easy to say in what manner provision could be made to utilise good old collodion for the marvellous productions obtainable by the rapid dry plate. There are, however, many side issues to the questions on which a wise practitioner would do well to ponder, such as the duplication of all valuable negatives taken on gelatine by means of collodion. Thus two strings would be had to the bow, one of which, at least, would possess the undoubted merit of permanency, and very likely for some purposes yield infinitely finer results in printing on certain mediums than the other. In transparency work again, there is no comparison between the two processes. What may be the printing process of the future is a question hard to answer in these days of discovery; but, at least, it seems certain gelatine has been tried and found wanting, and that a return to collodio-chloride is not improbable.

THE OWNERSHIP OF NEGATIVES.

NOTWITHSTANDING all that has been said on the above topic in back volumes of the JOURNAL there still seems to be a certain amount of misconception on some points in connexion with it. For example, last week we had to reply to a query in our Answers column, from a correspondent who was evidently not fully acquainted with the law on the subject; for, when a demand for certain negatives taken in the ordinary course of business was made by his customer, he unwisely, we think, gave them up. Now he is desirous of getting them back or recovering the value of them from those who now possess them. What degree of success he meets with it will be interesting to learn, for there is a point in connexion with the case which takes it rather out of the ordinary cases which have been dealt with before, when legal proceedings have been taken to decide the question as to who is the owner of the negative, inasmuch as the negatives have been parted with. There is an old proverb, "possession is nine points of the law." We have, it will be remembered, on several previous occasions cautioned photographers against mentioning negatives, or making any reference to photographing, in their invoices. It is once more to call attention to that point which is the object of the present article.

Our correspondent's case, as stated in his letter, is this. For some years past he has been taking photographs for an engineering firm until the negatives number some hundreds, which he has carefully stored and paid a heavy fire insurance upon each year. His clients now allege that they belong to them and, on their demand, instead of resisting the claim, he unwisely, we think, gave them up. Now he wishes to recover their value. Will he succeed and, if so, to what amount? Our correspondent says the invoices sent with the photographs were worded thus—"To first negative, 15 by 12 size, £1; to second negative, 15 by 12 size, 10s.; and so on." Now it will be seen that the advice we have so often given when dealing with this subject, with regard to making no reference in the charge for negatives or for photographing has been quite ignored, and the negatives themselves have been invoiced, and not only that they were actually given up when they were applied for. Yet, according to previously decided cases, they were the photographer's property.

For example, there is the case of Andrews v. Capper, tried some years ago, where the plaintiff, a photographer, sued for the sum of something like ten pounds for photographs and duplicates. The claim for the latter was not disputed, but

that for the originals, which amounted to about half the sum, was, on the ground that the negatives were not given up—the defendant's contention being that as a definite charge was made for "photographing," the negatives were his. The judge, however, ruled otherwise, and gave judgment for the full amount claimed with costs. Notice of appeal was given, but it was not persisted in. In this case, however, it will be noticed that no mention was made of negatives, but only of photographing.

In the case of the correspondent who wrote last week, negatives were, unfortunately, invoiced, and it might be argued in a court of law that, as a definite charge was made for them, they were the client's property. That contention might possibly, to an extent, have some weight with a judge who was not familiar with previous decisions; particularly as the photographer, when applied to for them gave them up and thus, in a way, tacitly admitted they belonged to the customer, unless indeed they were given up "under protest." Be that as it may, there are cases which have been decided in favour of the photographer when negatives were mentioned on the invoice, though not quite on all fours with that of our correspondent. Here is one:—

In a case tried in the Lambeth County Court in 1896, the late Mr. Edwards was sued by a monumental mason for damages for the detention of certain negatives which the latter claimed as his property. In this instance the plaintiff's counsel contended that the question at issue was not one of law, but of fact, and put in invoices which charged the plaintiff for "taking negatives and supplying copies of photographs." The judge, however, as there was no evidence of special contract, or that the negatives were specially paid for, gave a verdict for Mr. Edwards with costs. Here it will be seen the invoices were made out for taking negatives and supplying copies, yet, notwithstanding that, it was ruled that the negatives, though a charge was made for taking them, were still the property of the photographer, and not that of the customer. In the case of our correspondent, the charges were simply for negatives, so it will be seen that there is but a very trifling difference between the two cases, though they are not absolutely identical. As we mentioned at the commencement of this article it will be interesting to know if the value of the negatives, parted with under the circumstances detailed, will be recovered, and, if so, to what amount?

In conclusion, we would once more seriously impress upon our readers the great desirability, when photographs are taken away from home, or anything done out of the ordinary way, to studiously avoid any reference to negatives, photographing, &c., on the invoice, and to simply charge for the pictures supplied, and the travelling expenses. By doing that they will, in the case of litigation, should any arise, simplify matters considerably, and, very possibly, avoid it altogether. Litigation, however successful it may prove in the end, is always better avoided whenever it is possible.

THE BUSINESS END OF PHOTOGRAPHY.

THERE has recently passed through London, *en route* for Paris and Berlin, a Californian photographer. A young man, he had only been in photography for about seven years. In that time he had built up one of the strongest yet most select businesses in California's chief city. He is now building a new studio, and having left the work in the hands of a competent architect, he feels that it is possible to visit Europe, and see what she is doing. It is not a mere sight-seeing tri photography and the studios on this side are receiving steady a thorough attention, and he intends to take back with him a brain f of ideas. He will strike San Francisco again in time to prepare the social season, and he has full confidence that he will find connexion waiting for him. He will have made the tour which eve American hopes to make, and as a mere business investment he w have made it pay.

The business end of photography is too often one of the least co sidered, as it is undoubtedly one of the most important, of the fact which make for success in the profession. I do not propose to wr about book-keeping — it is very necessary in a business of a considerable size, and advisable in all. There are many business both in America and England, which make much money by doing poor grade of photography on a sound commercial basis; and th are men whose work is in the first flight who are unable to keep th studios open for six consecutive months.

By business methods, I at present mean those methods or schem by which photographers create interest with the public, and increa the amount of their turnover, by judicious advertising, by son speciality, by the showcase, the reception room, or the perso influence of the photographer. It is a large subject, and I propo merely to give a few suggestions, not necessarily to be adopted, but be thought over, which I have gleaned from conversations with ma American photographers.

There are in America two well-known photographers who business places and interests are as far apart as are London a Edinburgh. A few years ago one was making money "hand ov fist," and the other was barely making both ends meet. Being leade in the fraternity they were naturally friends, and they frankly di cussed the matter. They finally concluded that one had a go business system, and the other had not. The successful one careful explained his methods, and they were adopted *in toto* by the oth studio; one or two of the employées being temporarily transferred further assist the matter. To-day, both men are doing a large an remunerative business. So much for method—and fraternity.

In this instance the same business system proved applicable each place. But there can be no one rule or method. What "goe in East London would be fatal in the West End; and success at t seaside might spell failure in a small county city. The secret lies finding what is adaptable to the locality, and then starting out those lines to *make* business. The man who sits down and *wa* for business to come to him is the man who will some day appeal the Benevolent, after that excellent institution has been resuscitat by the P.P.A.

One of the most widely known of American businesses is that Strauss in St. Louis. The name of Strauss is known on this side of Atlantic as that of a man doing work second to none in the profess In America the work and the studio of Strauss are alike known; in his own city the studio is a great social centre. In answer t inquiry Mr. Strauss wrote that the watchword of his business uniform and universal courtesy. This courtesy has deliberately b made a leading feature of the business. The studio has been made one the show features of the city; its rooms have become a fashiona lounge, and three assistants are kept practically to attend to t convenience of visitors. The studio is in a suburb and there is bank in the immediate vicinity. Mr. Strauss keeps on hand a la stock of change, with which he not only "accommodates" peo but also uses it to cash cheques. Messages are received a forwarded, he has a special department for receiving parcels to forwarded by carrier, and in a hundred-and-one ways is a sort of g genius of the neighbourhood. I do not know if Mr. Strauss is of the "Ohio boys" to whom I referred in an earlier article, but twelve years of age he was working in a tintype gallery in a la Ohio city. Just twenty-one years ago he commenced his St. Lo business, and in the commencement was more fortunate than ma a photographer, for he took a shilling on the first day. The Stra gallery was for years the finest in America. Just a year ago it t fire and was utterly gutted. Mr. Strauss immediately commen giving sittings in a vacant studio, and offered a prize of ten guin for the best amateur photograph of the ruins. Doubtless, his n

lio when completed will transcend the old one, and publicity be tinued along the "courtesy" lines which have proved so essful.

recently had a long discussion with a very successful photo-pher who commenced life as a process worker. We often hear tographers advised to become block makers, but this man in-ted things by eschewing the etching bath and investing in portrait es. Like many people in touch with printing and journalism, he s an ardent amateur photographer, and one day—doubtless after ths of quiet thinking it over—he decided to invade the pro-sion. He was a well-known "man about town," and he saw that must be as well known to (or, rather, as well know) the ladies of town. To this end he cultivated the daily press, and especially se women journalists who are responsible for the social and iety reports. He accumulated a list of more than six thousand men of some financial or social standing, and carefully indexed ry one, with whatever particulars he was able to glean duly orded. He decided that the photographers of the city—two at st of them were good men—had made a mistake in remaining too ch in the city. He turned his attention to the fashionable idential suburb, and there he had the field to himself. There he ured a corner piece of ground on which to build his own studio, l he made it all—reception rooms, studio, work rooms—on the ound floor. Before building he spent a couple of hundred pounds visiting studios innumerable in search of ideas. And so when he d his architect finally got down to business, he knew exactly what required. He did a thing unheard-of in England—he consulted advertising expert and arranged a comprehensive scheme of blicity. His opening months saw many exhibits of work at his dio—the work of others in the fraternity—a show of American intings, of engravings, of autotype "old masters," &c. He ab-lutely declined to touch any of the ordinary print-out papers, and nfined himself to platinotypes at two guineas, and carbons at three ineas per dozen cabinets. To-day he has the most remunerative siness in the city, and the old-time men are still grubbing along in e business streets.

I do not quote these as typical cases; they are rather cases of ceptional success. But in each case they merely elaborated from a ry simple nucleus which may be the possession of any one. ourtesy is cheap, and equally accessible to a tintype worker and a trauss. The most modest of men, or the one in the smallest way of siness, can look around, "size-up" his fellow-villagers, and seek ork instead of letting it seek him. Both the cases quoted appear to those happy ones in which unlimited capital makes success easy; t that is really inverting the truth, for the capital was in each case rst made. Strauss tintyping at twelve years, and the other man alking barefoot behind a plough at an even earlier age, can scarcely termed other than self-made men.

It is business method—not, perhaps, of a commendable kind and rtainly grossly mis-applied—that drives free enlargements to ccess, and the same might be said of a newer, equally regrettable hase of business. It is very largely lack of any business method hich lets some photographers drift to failure.

My experience in America has been more particularly among the ore successful of the photographers. I find them without exception en of some (self-made) standing; of some position in social, or hurch, or other circles in their town. We judge our neighbours rgely by the estimate which they place on themselves, and as we dge others so are we judged. It is therefore a fatal business istake to be *too* retiring, too much in a groove. If a silk hat is the ark of the elect in some town, let the photographer wear one, and *ve up to it.*

There are several things which are a part of the humblest of usinesses, every one of which is worth some care and consideration nd every one of which is, in too many cases, woefully neglected. First, let us take the showcase or display window. I believe it ossible to have too much of a good thing in this line; certain it is hat sometimes we have too much of a bad thing. A showcase is ften the photographer's best method of advertising, and yet how voefully he neglects it. There is a common mistake of filling the howcase with returned prints, spoilt prints—any old thing. I have seen badly faded prints in a showcase; I have seen them absolutely and gloriously iridescent under the vagaries of a combined bath. And often—how very often—I have seen the glass in sad need of cleaning; and the prints themselves, in spite of air-tight showcases, supporting a deposit of London atmosphere. The remedy for these defects is obvious; so very much so that it is a wonder they exist.

I am rather inclined to think that the intention of the showcase would be better served if less work were shown. Instead of filling it up with cabinets or cartes-de-visite close packed in rows, let four suffice where there is room for a dozen. Histed, in London, shows a window full of large work, very unequal in merit, and in which the worst is the most aggressively conspicuous. Histed, in New York, displays just one specimen—and usually it is a gem. Small displays are the order of the day in Fifth Avenue, New York—the leading American thoroughfare and the highest-price-receiving photographic centre in the world. Falk and Miss Ben Yusuf neither of them show a single print. Histed shows one or sometimes two, and two sufficed Hollinger all through last summer. Mrs. Kasebier is content with four pictures, and Appleton seldom exhibits more than five. About the same number suffice the Misses Selby—English ladies, by the way, as is Miss Ben Yusuf. And so it is all along the Avenue. There is nothing very conspicuous about these displays—usually they are prints in small size, no larger than cabinets—but the prints are carefully selected and finished, tastefully mounted, and always looking fresh and clean in the cases. Some of the photographers carry the same system into their reception room, where they carefully limit the number of their display, some hanging even less than twenty pictures. The heterogeneous collection which we sometimes see in windows and reception rooms has, I fear, rather a tendency to suggest cheapness. A carefully selected display, limited in number, scrupulous in cleanliness, and frequently changed, would do much to improve the appearance and tone of many a reception room.

I wonder if photographers ever realise how rubbish accumulates. All studios are—or should be—workshops, and we do not usually associate the workshop and the drawing-room. But what is the impression of the lady who comes to be photographed—the lady who will judge us according to our works? She does not come into a well-known room; she comes into a new sphere and with a fresh and interested eye. And either she will receive a pleasant impression from that first glance, or she will note the defects. There may be grime on the window, dirt or litter on the floors. Such things are unpardonable—and they exist, though not so frequently as of yore. But even in a clean studio there is often a quaint accumulation of accessories which are never used, and which give a lumber-room appearance which is scarcely conducive to business.

I am just skimming over branches of business about which much might be said, and some I must omit altogether. I would like to mention one thing which is too often ignored by photographers, and it is one of the non-evadable things by which wealth and culture invariably judge a man: I mean the matter of stationery. I once received a letter from a well-to-do photographer and it was written on the cheapest of notepaper, on which his name "Artist-Photographer" was printed in common type and with a cheap ink. In the corner two cherubs were playing with a palette. I carefully tore off the head of his notepaper, and under "Artist-Photographer" I wrote "hats blocked while you wait." It was a remark scarcely pertinent to the occasion, and it was cruel. Consequently he was indignant. But he now uses notepaper worthy the dignity of a profession, and so my end is attained. This little matter of stationery is not trivial, for a large portion of a photographer's stock-in-trade is, or should be, his elegance and refinement in matters of taste. A letter to a customer or prospective customer should be as carefully handled as though it were a personal interview.

The sending of letters, or of some carefully thought-out advertising circular, is a line which is sometimes profitable. I merely drop the hint here, remarking that some photographers have, unfortunately, absolutely spare, dead time, in which they can but wait for something—or somebody—to turn up. Cannot this dead time be utilised?

There is just one more thing and I have done. There is an old,

worldly proverb, "Keep as far as you can from poverty." I think one of the greatest misfortunes of the profession, in America and in England, is the Assistant question. And especially is this so in the matters of Sunday work, and of uncertainty or irregularity of employment. No man can do a good-class business on cheap labour. This is no matter of philanthropy; it is hard business sense. If a man's employés are paid starvation wages, they may be underpaid, or they may be incompetent workers. In the first case wages should be raised, in the second case the people should be discharged—not philanthropy—and better workers, at better prices, take their place. There are in America a very limited number of carbon printers who are worth, say, eight pounds a week. I mean carbon printers who are employed as such; several master-photographers are equally competent, but they are not available in the labour market. There are others who are worth from three to five pounds; and there are plenty of them. But there seems to be just a lack of the very best men, for two photographers in New York City, who both employ men at about five pounds, have both been quietly looking out, for months, for the higher-priced man.

I thought I had done, but here is an interesting little fact worth thinking over—the trade printer and the trade enlarger are unknown quantities in America. WILLIAM EDWARD WARD.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

THERE will be a meeting of the Provisional Committee of the Professional Photographers' Association this (Friday) evening, June 14, at the Studios of Messrs. Alfred Ellis & Walery, 51, Baker-street, London, W., at eight o'clock. The principal business will be to make arrangements for the first General Meeting of the Association, to be held in London on Tuesday, July 2, probably at the rooms of the Royal Photographic Society. It is to be hoped that every member of the Provisional Committee will make a point of putting in an appearance to-night, as the work to be done is extremely important.

It may be as well to point out that the existence of the Provisional Committee of the Association terminates at the General Meeting of members in July next. No doubt it will be recollected that at the public meeting at Anderton's Hotel on March 28, the Committee was appointed for a period of three months only. Its assigned business in that time was to draw up rules and a constitution, to organize the membership and, generally, to put the Association on a workable and permanent basis. All this has been successfully accomplished, and no doubt at the July meeting the members present will ratify the various steps that have been taken on their behalf. On that occasion a permanent executive must be chosen. The constitution of that executive—the personality and professional standing of the President, Vice-President, the members of the Committee, and the principal officers, are matters that must be very seriously considered beforehand. Incompetents, wastrels, and faddists should be rigorously excluded from the Executive Committee of the Association. Men of business with a firm faith in the future of professional photography, and a sincere desire to lift it to a plane of dignity and profit immensely higher than that upon which it stands at present, should be chosen to conduct the affairs of the Association. The loud cry of the Age is for the presence of "good men" at the head of all departments of public affairs; and if the members of the Professional Photographers' Association have something of the same feeling in regard to the management of that body, and insist upon giving it expression, we have no doubt whatever that a career of profound usefulness lies in front of it.

SECOND LIST OF MEMBERS OF THE ASSOCIATION.

Appended is a second list of members of the Association, kindly sent us by Mr. Alfred Ellis, the Honorary Secretary.

Adams, Walter, Adams Studio, 29, Blagrave-street, Reading.
Barnes, A. H., 14, Cheap-street, and Abbey Churchyard, Bath.
Barry, W., 7 and 8, Park-street, Anlaby-road, Hull.
Bradshaw, George (Bagnal & Co.), High Bank Studio, Church-street, Altrincham, Cheshire.
Berry, Luke & Son, Excelsior Studio, Chorley, Lancashire.
Ballard, Edmund G., 10A, Welsh-street, Chepstow,
Biggs, George St. John, Portland Studio, 56, West-street, Ryde.
Bliss, Henry James, 1, London-road, Grantham, and 34, Lombar street, Newark.
Barker, William Edward, 134, East India Dock-road, Poplar, E.
Bullingham, Henry, 21, Harrington-road, South Kensington.
Barraud, Mark Bernard (as Mayall & Co.), Clarence Studio, Clarence-street, Kingston-on-Thames.
Clark, Frank William, 284, Romford-road, Forest Gate, E.
Charlton, John E., 14, Mercery-lane, Canterbury.
Cook, Joseph, 32, High-street, Paisley, also 61, King-street, Kilmarnock.
Cautrell, Charles, 111, Stanley-road, Bootle, near Liverpool.
Coote, Henry Frank, 17, Clarence-street, Staines.
Cade, Alfred H. Junior, Photographer, Hockcliffe-street, Leighton Buzzard, Beds.
Davies, Henry Hicks, 26, Pier Street, Aberystwyth.
Dereske, Charles & F. F., 36, East-street, Derby.
Dawson, Charles, Church-villas, Hednesford.
Entwhistle, Harry, Technical Photographer, 29, New Cannon-street and 45A, Market-street, Manchester.
Edwards, Herbert Joseph (Edwards & Co.), 102, Leytonstone-road, Stratford, E.
Ellis, George Sydney, 8 Albert-street, and Church-street, Mansfield
Fairclough, James, Manor House Studio, Crook.
Fisher, Tom George, 174, Edgware-road, W.
Gilbert, William Henry, Art and Photographic Studio, 21, Wyle-cop, Shrewsbury.
Gostellia, C., 55, Thomas-street, Limerick.
Gould, Chalkely (Debenham & Gould), Glen View Studio, Bournemouth.
Greenacre, John S., 101a, Rosemount-place, Aberdeen.
Gael, Edgar, 77, White Ladies-road, Clifton, Bristol.
Hick, Vivian M., Photographic Artist, Bridge Studio, Horncastle.
Hubble, David Louis Henry, 59, Tantarra-street, Walsall.
Jackson, Charles Arthur, 2, Clegg-street, Oldham, and Middleton.
Jones, Son & Harper, 51, Broad-street, Ludlow.
Jenkins, Henry, Alpha Studio, Tunbridge Wells.
Kay, Nathan Smedley, 55, Knowsley-street, Bolton.
Kay, Julius A., Burlington Studio, 211, Lord-street, Southport.
Lowthian, Harry (Lowthian Bros.), 144 and 146, Freeman-street, Grimsby.
Leonhardt, Rudolph, 3, Exchange-walk, Nottingham, and 7, Horse fair-street, Leicester.
Lee, Arthur W., 118, Stroud Green-road, Finsbury Park, N.
Lewis, Albert George, 62, Shaw Heath, Stockport.
Mewhew, Hardingham Rushbrook, Art Studio, Lynn-road, Wisbech
Moore, George, Fore-street, Buckfastleigh, Devon.
Milne, Alexander Crowe (D. Milne & Sons), High-street, Blairgowrie.
MacMahon, John, 502, Union-street, Aberdeen.
Martin, Walter William, High-street, Ilford, Essex.
Morrison, William, 11, St. James's-street, Nottingham.
Nainby, Fred, Photographer, Challoner-street, Cockermouth.
Perkoff, Isaac, St. Petersburg Studio, 186, Commercial-road, and Vine House Studio, 18, Lea Bridge-road, Clapton.
Reston, Arthur, Edge Lane, Stratford.
Skeels, Ernest Edwin, East Park-street, Chatteris, Cambs.
Skillman, Charles Henry, 22, Uxbridge-road, Shepherds Bush, W.
Stewart, Robert, Photographer, 135, High-street, Elgin.
Spence, John Ingram, 13, Bridge-street, Musselburgh.
Suisse, O. P., Lombardi's Studio, 79, West-street, Brighton.
Sachs, Oscar Albert Leopold, 8, Manningham-lane, Bradford.
Sellman, William & Co., The Studio, 56, West Parade, Huddersfield
Speight, Clare, Caton-road, Nuneaton.
Syms, T. Lee, 69 Castle-street, Tyldesley.
Turner, Thomas Charles (Turner & Drinkwater), Regent's-terrace, Hull
Valentine, James Upton (Valentine & Sons), 9 Somerset-place, Teignmouth.
Watson, Henry William, The Studio, Clarence-street, Gloucester and Bayshill Studio, Cheltenham.

vil, Clara (E. Hawkins & Co.), 32 Preston-street, Brighton.
ison, Gilbert, West House Studio, Esplanade, Grange-over-Sands.
rd, Henry M., 41 Belgrave-avenue, Leicester.
ite, Richard Howard, American Studios, 107a and 120a Bold-street, and Conway-street, Birkenhead.
lliams, John George, Bridge-road, East Molesey.

'he foregoing list, added to the one that was published in last k's JOURNAL, gives a total, in round numbers, of two hundred and y "paid-up" members of the Association. This, in our opinion, is a arkably encouraging start. Six months ago if it had been hinted t, notwithstanding the dismal failure of the old N.A.P.P., there s still scope for the formation of a Professional Association, the a would have provoked nothing but incredulity and ridicule. It l almost passed into a proverb that professional photographers could be induced to combine for purposes of mutual interest. The verb has been completely falsified. Here we have a solid body of nest men, amongst whom are included some of the ablest photo-phers of the day, banded together in an Association whose objects, nainly defensive, obviously embrace all those which should help in realisation of that old, old aspiration, the elevation of the status professional photography. In the not distant future the Association uld exercise such a beneficial influence over its members and their ling that the absence of a professional name from its roll should looked upon as in the nature of a reproach. In the famous rds of Lord Crawford, the "bread-and-butter side of photography" uld be advantaged by the new Association, which, it may cerely be hoped, will before long stand in the same relationship wards British professional photography as the societies devoted to chitecture, engineering, surgery, medicine, &c., occupy towards actitioners engaged in those great professions.

But the 260 paid-up members of the Association by no means present its real, its ultimate strength. There are scores, nay, hundreds, of names to be added to this list. We print below the form of plication for membership that has already been issued. It can sily be filled up and returned with the subscription (5*s.*) to the onorary Secretary, Mr. Alfred Ellis, 51, Baker-street, London, W. et all those who wrote letters to this JOURNAL last February and arch advocating the formation of a Professional Photographers ssociation—let the many hundreds who, for years past, have sighed these columns for a society which should defend and promote pro-ssional interests—let all these "cash their paper" by becoming embers of the Society whose Membership Application Form is pended:

To the Honorary Secretary,
Professional Photographers' Association,
51, *Baker-street, London, W.*

Please add my name to the list of members of the Professional hotographers' Association. I enclose the amount of my first year's ubscription, 5*s.*

*Signature*_____
_____1901.

Please fill in the following particulars for Members' List:—

'ull Christian and Surname _____
'ull title of Firm or Company _____
'ull Address_____
_____

THE LATE GEORGE MASON.

T is with the deepest pain and regret that we have to record the eath of Mr. George Mason, who passed away at his residence, Fern 'ower, Kelvinside, Glasgow, on Thursday, June 5th, aged 62. The eceased gentleman had been in declining health for about three ears. When we last saw him at the Newcastle Convention in July 900, his feebleness of movement and lack of vitality foreshadowed nly too plainly the imminent close of a busy life, during which he had won and preserved the respect and esteem of thousands of photographers in all parts of the world. Since last January he had been entirely confined to his house in a state of paralysis, and the end of his sufferings came as no surprise to his relatives and friends. Cut off at an age when most successful men of business look forward to the calm peace of the twilight of life, before finally laying down its burdens, there will surely be a widespread feeling that George Mason has left us before his time. To Mrs. Mason, Mr. George Mason, junior, and the other members of the family, we offer our heartfelt sympathy in their bereavement.

This sympathy is strengthened by the knowledge that we enjoyed the privilege of the late Mr. Mason's personal friendship for several years, and can look back to many acts of kindness received at his hands.

"George Mason of Glasgow," as he was universally known, was the head of the well-known photographic dealing business bearing his name which, formerly conducted in Sauchiehall-street, and latterly in Buchanan-street, may fairly be regarded as the parent stem from which many branches of photographic activity have sprung in the commercial capital of Scotland. Born in Alloa in 1839, he entered the service of the late Mr. John Spencer of Glasgow in 1863, and six years later became his partner. The house of John Spencer still exists, but now solely confines itself, we believe, to export business. It was in 1870 that Mr. Mason took over on his own account Mr. Spencer's general photographic dealing and retailing branch, and since that time has carried on business successively in Union-street, Sauchiehall-street (where he traded for twenty-four years), and, as we have said, latterly in Buchanan-street. It was once the legitimate boast of George Mason & Co. that they held the largest stock of photographic goods in Britain, and within our own recollection the firm had a very great sway indeed in the North of England photographic trade. Mr. Mason was at one time, we believe, on the Board of the North British Dry Plate Company, and of Messrs. G. W. Wilson & Co., Limited. He took up practical photography so far back as 1853, in which year he made stereoscopic transparencies popular in Edinburgh. His long experience of photography had endowed him with a rich store of historical knowledge of a kind not to be found in printed records, and as a raconteur of the doings of the photographic world in the days that are gone he was always greatly appreciated.

The late Mr. Mason was a Fellow of the Royal Photographic Society, and in 1893, at the Plymouth meeting, he occupied the Presidential chair of the Photographic Convention of the United Kingdom, of which he was an original member and always a warm supporter. Indeed, no Convention meeting was complete without his genial and inspiriting presence. He took part in the formation of the defunct Central Photographic Club, and actively supported the Photographers' Benevolent Association for several years. Endowed with very marked literary ability, he frequently contributed over the *nom de guerre* of "Mark Oute" to the pages of the BRITISH JOURNAL OF PHOTOGRAPHY and its ALMANAC. To this day a volume of studies of photographic life, incident, and character of which he was the author, "Pictures in Black and White," is held in appreciative remembrance. He constructed fluent and graceful verse, always on his favourite theme, photography, and under a second *nom de guerre* of "Murray Russell," published several works of fiction. A shrewd man of affairs, the storm and stress of commercial life happily failed to wrest him from a love of literary elegancies. Locally, the late Mr. Mason was held in high esteem, and his funeral, which took place at the Glasgow Necropolis on Saturday last, was attended by a large number of friends and others connected with photography in the West of Scotland. The Photographic Convention of the United Kingdom was represented by a wreath specially sent. George Mason will be greatly missed for many a long day. His stirling good qualities and bright outlook won him a distinct place in the photographic world, and his passing away creates a gap that must remain unfilled. Of all those who have cause to think kindly of him, few will do so more lastingly and sincerely than the Editor of this JOURNAL, who regretfully takes leave of a wise and good friend.

FOREIGN NOTES AND NEWS.

"Fashionable" Photography in Australia.—From a Melbourne contemporary we reproduce a news paragraph which, we are told, is typical of the advertising methods adopted by Australian photographers. They are certainly to be commended for their business pushfulness: "Visitors to Melbourne will do well to call at the Royal Studios, corner of Bourke and Swanston-streets, and view the lovely portraits displayed in their show cases, and note the extremely low prices that this studio is charging. The Royal Studios have now become the fashionable resort of Melbourne folk for first-class photographs. Modern posing and artistic finish, combined with the lowest prices in the city, cause a constant stream of fashionable people to assemble at the studios for the purpose of being photographed. The operating-room being under the direct supervision of the proprietor ensures a guarantee that every sitter secures complete satisfaction." British photographers will, no doubt, be edified by this grandiose way of doing things. Here at home we cannot rise to the height of turning our studios into resorts for "streams of fashionable people." Such streams, alas! rarely enter our doors. And our "operating-rooms" break down at the occult property of guaranteeing satisfaction to the sitters! People here are only satisfied by good results.

The "Hypergon" Double Anastigmat.—We have already chronicled the introduction of this lens by the well-known optician, C. P. Goerz, of Friedenau, and from the latest communication in one of our German exchanges it seems to be constructed of two deep meniscus lenses of very little thickness placed symmetrically as regards the diaphragm. The lens is not corrected for spherical aberration, and, the components being simple lenses, there is also difference of visual and chemical foci, but this may be got over either by a correction after focussing or by focussing with *f*-20 and exposing with *f*-30; smaller apertures than this are not of much effect upon the definition. The angle included is about 140°, or, to put it in popular language, it will cover a plate the diagonal of which is five times the focus of the lens. The inequality of illumination of such an angle is, of course, enormous at the edges, being more than one-fiftieth of the axial rays. It is advisable, therefore, to use an equalising or star diaphragm.

Monochromatic Light Filters.—A concise prècis of some notes by Dr. Nagel of Freiburg on this subject, which are given in the *Photographische Chronik*, may be useful to three-colour and other workers. An orange filter which only transmits rays between C and D is made by adding to a solution of cupric acetate a few drops of glacial acetic acid, and then drop by drop a concentrated solution of safranine till the solution does not allow any violet, blue, green, or yellow light to pass. A yellow filter can be made by adding to a saturated and slightly acid solution of cupric acetate an acid solution of "orange G" till the brown solution only allows yellow light to pass. A yellowish-green filter is made by acidulating a saturated solution of potassium bichromate with glacial acetic acid and then adding crystals of cupric acetate, heating the solution and allowing to cool. A green filter is made by adding drop by drop a solution of ammonio-carbonate of copper to a saturated solution of potassium bichromate, till it no longer transmits red light, and then adding a few drops of an alkaline solution of fluorescine. A blue filter is produced by mixing a weak solution of methyl green with a solution of cupric acetate till it no longer transmits red. A violet filter can be made by mixing a concentrated solution of ammonio-oxide of copper with seven parts of water, and combining with it a solution of permanganate and potash, this giving pure violet light between F and G. A red filter can be made by dissolving carmine in carbonate of lithia and adding picric acid solution.

A Gelatine Positive Process.—Monsieur Alph. Blanc recently made a communication to the Société Française de Photographie concerning an emulsion of a peculiar character that he had recently experimented with. The gelatino-bromide emulsion seems to have been pushed beyond the stage of high sensitiveness in its preparation, for by transmitted light the sun appeared colourless instead of blue, when viewed through one of these films. The plates, also, were completely reduced by the developer without exposure, but if struck by light, development produced less intensity in proportion to the duration of the exposure. Positives were obtained by contact exposures, but, although somewhat feeble, they were very fine in the grain and could be intensified in the usual way. With one second exposure in the camera a very feeble negative was obtained, which could not be strengthened by further developmer as the plates blackened completely. In one of the experiments plate was cut in two. One half was exposed to light for about minute and then developed simultaneously with the unexposed ha The exposed half veiled immediately and remained of a greyi colour. The unexposed half did not begin to develop until after th other, but finally reached the stage of complete reduction. Aft fixing, the two halves were placed upon a sheet of paper and th exposed half was only slightly grey, whilst the unexposed was blac M. Blanc explains the difference upon the assumption that emulsion are never completely homogeneous; the particles of silver bromic being of various degrees of sensitiveness. In the plates givin positives there must be a residuum of normal emulsion, whic produces the slight veil, and he attributes the negative obtained i the camera to this small quantity of normal emulsion. In th ordinary course the formation of the latent image is due to th partial decomposition of the silver bromide, but in the abnormal plate referred to, decomposition had already been set up throughout th film, and the action of light may have tended to reconstitute norma bromide of silver. No proof of the latter is given.

Stops for Half-tone Work.—The two stops figured her are said to obviate a considerable amount of fine etching. Fig. 1 i used for the deep shadows; a second stop of the same pattern bu

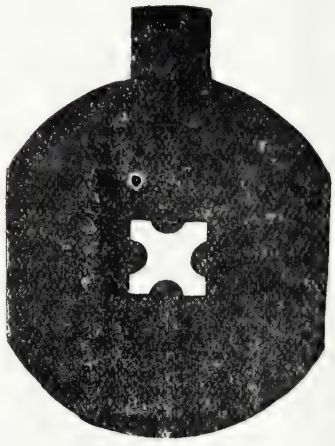


Fig. 1.

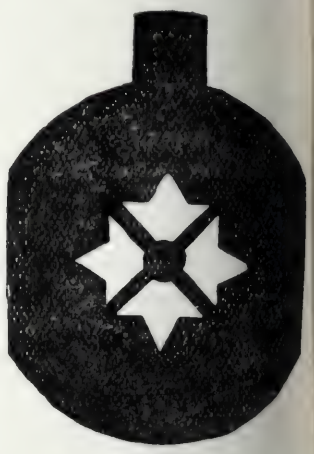


Fig. 2.

with larger aperture is used for the half-tones, and fig. 2 is used for the high lights. The opaque centre of fig. 2 is said to be of great importance.

Photoxylography.—By mixing the following three solutions a powder which is sensitive to light can be obtained, which can be rubbed on a wood block that can be printed on to in the ordinary way.

No. 1.

Resin	15 grammes.
Alcohol	100 c. c.
Erythrosine	1 gramme.

No. 2.

Ammonium bichromate	10 grammes.
Ammonia	100 c. c.

No. 3.

Silver nitrate	1 gramme.
Ammonia	20 c. c.

Mix 50 c. c. of No. 1 with 10 c. c. of No. 2, and from 6 to 10 c. c. of No. 3, filter and dry the powder thus obtained, and it can at once be rubbed upon the wood block, which should be previously coated with celluloid varnish.

Toning P.O.P.—M. Helain suggests the following procedure to obtain red prints on P.O.P.:—

Ammonium sulphocyanide	5 grammes.
Potassium iodide	0·0 to 1·50 „
Water to	1000 c. c.

and add with constant stirring, dissolved in a little water—

Chloride of gold	0·25 grammes.

This should be prepared as wanted. The prints should not be printed deeper than usual and well washed prior to toning, and when

desired tone has been attained they should be again well washed fixed for at least fifteen minutes in a fifteen or twenty per cent. solution of hypo. By employing the maximum quantity of le, a carmine red is obtained, by reducing the quantity the tones ined are similar to those obtained with the normal bath with a ency to purple. Toning for the red stage must not be curtailed, takes about thirty-five to forty minutes.

richrome Transparencies.—M. Leon Vidal states that best method of obtaining these by superposition of stained is to sensitise thin celluloid films as supplied for negative work 0·75 per cent. of bichromate of potash, then to dry in the dark expose in the printing frame in the usual way. The exposure is short and is, of course, made through the celluloid in contact the three negatives representing the red, the yellow, and the sensations. The exposed films are developed in water at 50° or C. and fixed in a fifteen per cent. solution of hypo, and then washed and dried. They have then to be coloured and this is by immersion in solutions of erythrosine, methyl green, and a ture of aniline yellow and naphthol yellow. The strength of the ing has to be determined by trial and error. When sufficiently ed they are pinned up to dry and then superimposed, the yellow by mounting by the corners on a sheet of glass, then the blue, finally the red, and the results are bound up as lantern plates in ordinary way.

aterproof Dishes.—Herr Hauberrisser states that the ing of wooden or metallic dishes with a solution of pure asphalt enzole and subsequent exposure to light renders them immune nst the attacks of water, developers, fixing, and all other photo- hic solutions. To prepare the asphalt solution one part of powdered an asphalt should be dissolved in five to six parts of benzole and red through a cloth, and the solution thus obtained mixed with or four times its volume of ether till a precipitate is no longer ed, and then the precipitate collected and well drained and dis- ed in from ten to fifteen times its volume of benzole, and this ted thinly over the dish and allowed to dry and exposed to ght for several days. Two or three coatings may be given or a ger and more resistant solution can be obtained by the addition bout five per cent. of copaiba balsam.

ill Plates be Dearer?—The "Actien Gesellschaft für in Fabrikation" has issued a circular giving notice of an increase e prices of their plates and films. They are compelled to make change in consequence of the increased price of glass and the higher s they have to pay. The 9×12 cm. plate, which is rather larger the English quarter-plate, was formerly listed at 1*s.* 8*d.*, but been raised to 1*s.* 11*d.* The popular price for a 9×12 cm. plate is country is 1*s.* 4*d.*, and it therefore seems possible that English plates may find an important market in Germany, notwithstand- freight and duty, if the cost of production remains unchanged in country.

latinum.—The "Central Zeitung für Optik und Mechanik" a short note upon the platinum industry. Ninety-six per cent. of total quantity of platinum is derived from the Ural district. vithstanding the growing demand, the supply remains almost onary, for the reason that the mines cannot place more metal the market. Last year the price per Russian pud was 14,000 les (about 2*l.* 10*s.* 8*d.* per ounce), and as the cost of production from 4000 to 8000 roubles per pud, the industry is very lucra- The production of platinum during the last ten years has been llows:—

1891	258 puds.	1896	301 puds.
1892	279 „	1897	345 „
1893	311 „	1898	365 „
1894	318 „	1899	363 „
1895	269 „	1900	332 „

NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

[Abstracted from the Official Report.]

MEETING of the National Photographic Record Association was held t. Pancras Hotel, on Wednesday, May 22, 1901, a large and sentative gathering of members and friends being entertained by President, Sir J. Benjamin Stone, M.P. Before the formal busi- was approached, those present embraced the opportunity of examining a number of recent contributions to the Association's collection. The President exhibited pictures of the Regalia Collection at the Tower of London, and others taken on Helstone Flora Day, showing the "Furry Dance," &c. Amongst those present were Mr. Purdon Clarke (of South Kensington Museum), the Rev. J. O. Bevan, M.A., F.S.A., Mr. and Mrs. Snowden Ward, the Rev. C. J. Moncrieff Smyth, Mr. G. A. Storey, A.R.A., Mr. Ralph Nevill, and Mr. Philip Norman, whilst letters of regret at inability to attend were received from a number of people interested in the Association's work. The Honorary Secretary (Mr. George Scamell) read the following report upon the past year's labours:—The Council have the pleasure to report that since the meeting held here last year, on the invitation of Sir J. Benjamin Stone, the N.P.R.A. has made steady progress, and the value of the work is now universally acknowledged. Since February, 1900, we have received 669 prints, the chief contributors being our President (Sir J. Benjamin Stone), who has forwarded 100 views of Warwickshire, including a series of Stratford-on-Avon, Meriden, Bidford, &c., and of some of the old customs, as the collection of the Wroth Money at Knightlow Hill, and scenes at the Mop Fairs at Stratford and Bidford; Mr. B. Diven, coast scenery, Banff, &c.; Mr. Thos. Bolas, seven views of Old London, including four of Old Newgate Prison; Mr. J. K. Sulman, 19 views of Old Crouch End and Hornsey—a particularly interesting series, as most of the houses have been removed since the negatives were taken; Mr. G. Bingley, 101, principally of the antiquities of Yorkshire, and of the sculptured stones at Meigle Forfar; the Duke of Bedford has kindly contributed 27 views of Old London, many buildings included in this series having been since removed; Mr. S. J. Beckett, two of the late Queen Victoria's Funeral, and two of the Procession to the Houses of Parliament by King Edward VII., on the occasion of his opening his first Parliament; Mr. Marchant, views of Tavistock House, the residence of the late Charles Dickens; Mr. B. E. Lawrence, 33, principally from Somerset; the Herefordshire Society have forwarded a selection, the greater number being by their Hon. Secretary, Mr. C. Gethen; Rev. C. J. Moncrieff Smyth, a very interesting series of Copford Church, Colchester; Mr. E. Scamell, old houses in Fetter-lane and Fore-street; and a miscellaneous collection by the Hon. Secretary. The Association is also much indebted to Mr. Horsley Hinton for having promoted a competition in connexion with record work, prizes having been given by the proprietors of the "Amateur Photographer." A large number of prints were received and prizes duly awarded, and the prints, to the number of 122, were presented to the Association, the contributors being A. R. Hogg, F. Parkinson, F. R. Armytage, R. W. Dugdale, Geo. Calcott, G. J. Felce, F. Littledale, H. W. Smith, J. C. Clark, Mrs. Muriel, Mrs. Gandy, Miss Cotton, W. J. Hodgson, and the Rev. A. C. Hervey. The Council have also to acknowledge the receipt of a gift of £5 towards the funds by the Congress of Archæological Societies, per Mr. R. Nevill, and the London County Council have kindly promised copies of their photographs of Old London. The editor of the "London Argus" has published in that journal a series of views selected from the record collection, and the Council are indebted to him for proof copies of the same which he has presented for distribution. Survey Societies have been started at Hull and Leicester, and the Deputy Mayor of Hereford (Mr. F. N. James) has presented the Free Library at Hereford with mounts, boxes, &c., for the first 100 prints to start the record collection now being made by the Herefordshire Photographic Society. The movement is also spreading on the Continent, as, in the last letter received from M. Vidal, of Paris, he states M. Demole, of Geneva, has founded a society for Switzerland. At Stockholm, a society has been started for Sweden, and another has been started for Belgium. In order to carry on the work in a systematic way, the Council have endeavoured to start centres in various parts of the kingdom, and Messrs. J. R. Singer, Chippenham; J. S. Hawker, Plymouth; M. Dillon, Crewe; M. W. Dunscombe, Bristol; Rev. E. Travers Clark, Gloucester; J. A. Reid, Bedford, have undertaken to represent the Record Association in their various districts. Having only recently joined in the work, as yet there are no results to report. An Exhibition of Record Work was held, by the kind permission of the Royal Photographic Society, in their rooms, 66, Russell-square, when 130 prints were exhibited, and the exhibition was opened Wednesday, March 7, 1900, by an address by the President, Sir J. Benjamin Stone. The Council would take this opportunity of thanking their many friends for their contributions, which now number, with those promised, about 2000; and would appeal to all interested in the work to assist in increasing the fund at their disposal, as there are a very large number of negatives

in the hands of the professional photographers of great historical interest, from which prints could be obtained upon payment of a small sum; and if the Council were in a position to do so, a very valuable selection could be obtained from such sources, which, at present (for financial reasons), are not available for the record collection.

Sir J. Benjamin Stone, in moving the adoption of the report, said that it was very encouraging, marking as it did a steady progress of the work throughout the country. Many counties and boroughs were now taking up the work, and doubtless in a short time they would find the objects of the Association recognised by the general public all over the kingdom at their proper value. The list of contributed pictures showed that the collection was enriched by records of very important things. His own work had been in the direction of preserving some of the old customs that still prevailed in various parts of the country, notably the ceremony at the Tynwald Court, in the Isle of Man, where Manx Laws are read in the Manx tongue to the people assembled in the open-air around the Tynwald Hill, and the spring festival ceremony at Helston, in Cornwall, when the people congregate and decorate the town with flowers, and dance in the streets. In the places where such celebrations were still carried on he found that the people of the locality eagerly looked forward to the repetition of such quaint customs year by year, and many came from far to witness and take part in them. It was the preservation of records such as these that provided reasons for the Association's existence, and he was sure that it was the wish of every one present that they should prosper. One thing he wished to emphasise was, that there were in existence hundreds of negatives of historical importance, prints from which should find a place in the Association's collection, but the difficulty was to get at them. He sincerely trusted that the press which had so loyally assisted in the past would continue to help by frequent reference to their aims and their achievements, as thereby the public would continually have the objects of the organization in mind. Sir Benjamin said that, in closing his remarks, he could not omit to refer to the devoted labours of their great pillar of support, Mr. George Scamell, the Honorary Secretary, to whose help much of the success of the scheme was due.

Mr. Purdon Clarke seconded the motion, testifying to the excellent work that was going on.

The motion was also supported by Mr. H. Snowden Ward, Mr. Ralph Nevill, and the Rev. C. J. Moncrieff Smyth, who detailed some of the difficulties he had encountered in photographing at Copford Church. He acknowledged the great kindness rendered him by the Rector, and spoke of the church as one that presented opportunities for much "photographic record" work.

The motion for the adoption of the report having been carried, Mr. G. A. Storey, A.R.A., spoke of the interest that an examination of the prints had aroused in him. He thought that, whilst a record of the exterior of a building was of great value, whenever it was possible a view of the interior should also be made, because the inner apartments of old houses were often of particularly interesting a character. It was his very pleasing privilege to propose a hearty vote of thanks to the Council and officers for their work during the past year, and he sincerely hoped that the Association would continue to flourish and increase in usefulness.

The Rev. J. O. Bevan seconded the motion, and touched upon his own plea for the production of an archæological map and index of England and Wales, county by county.

The motion having been adopted by acclamation, Mr. Ralph Nevill moved the re-election of Sir J. Benjamin Stone, M.P., as President for the ensuing year, to whose energy he ascribed much of the life and success and strength enjoyed by the Association in the past. The motion was carried unanimously.

Sir Benjamin thanked the meeting for his re-election, and the following were elected as the Council and officers for the coming year:—

The Right Hon. the Earl of Crawford, K.T.
Sir E. Maunde Thompson, K.C.B. D.C.L.
Sir H. Trueman Wood, M.A.
Harold Baker.
C. E. Fagan.
L. Fletcher, F.R.S.
A. Horsley Hinton.
St. John Hope, F.S.A.
B. E. Lawrence, LL.D.
A. Mackie.
J. W. Marchant.
Dr. H. R. Mill.
Ralph Nevill.
P. Norman, F.S.A.
J. Thomson.
H. Snowden Ward.
Mrs. Catharine Weed Ward.
H. B. Wheatley.

Hon Treasurer—Alexander Graham, F.S.A.
Hon. Secretary—George Scamell.

WARWICK, LEAMINGTON, AND KENILWORTH.

[Reprinted from the "Handbook to the Photographic Convention of the United Kingdom."]

THE towns of Warwick and Leamington practically form one lar city, the distance between the two being an easy walk, and t buildings along the route being almost continuous. Of the two tow the former is comparably the most interesting, Leamington bei merely a fashionable modern suburb attached to the historic town Warwick. It seems best, therefore, to consider Warwick first.

Warwick traces its origin, as far as any tradition is extant, Gutherline, King of the Britons, who is said to have founded it at t commencement of the Christian Era. Existing traces go at least far back as the year 915. Probably the oldest existing portions the town are to be found within the grounds of Warwick Castle, t seat of the Earl of Warwick. The entrance to the Castle is at t bottom of Castle Hill, and the exterior gateway is comparative modern, having been erected in 1800. Once inside the outer ga however, the visitor is at once confronted with relics of the past, the shape of the massive gateway flanked by Cæsar's Tower on t left, and Guy's Tower on the right. The gateway was built in t 14th century—it still retains the ancient portcullis, which is lower and drawn up every night and morning. Cæsar's Tower was probab erected in the latter part of the 14th century by Thomas Beaucham It is 147 feet in height, contains various apartments, and has dungeon below it. Guy's Tower was built by the second Thom Beauchamp at the end of the 14th century, is a twelve-sided stru ture, walls ten feet thick, it is 128 feet in height, but looks tall than Cæsar's Tower, owing to its standing on higher ground. It co tains five stories of apartments. It can be ascended by a flight steps, and affords a grand view of the surrounding country. In t courtyard is a large lawn, on the east side of which is the mou known as Ethelfleda's Mound, which is the site of the oldest know portion of the Castle, viz., the fortress erected by Ethelfleda, wife Etheldred, Earl of Mercia, and daughter of King Alfred. On eith side of the mound are two towers, the one on the right being t Northern Tower, and that on the left the Hill Tower. On the nor side of the courtyard are two unfinished towers called the Be Tower and the Clarence Tower, the gateway between which leads in the gardens. On the left (south side of courtyard) is the priva portion of the building, which fronts the river Avon. The Castle a splendid example of the fortified structures of the 14th century, an the interior is a more recently designed domestic establishment, muc of which dates from the early portion of the 17th century. The hi tory of the Castle is too lengthy to be done justice to in these pages like all similar structures it has had a varied career, and has been t scene of many events in history. Perhaps the most eventful crisis its past was reached when it became the scene of a siege during t Civil War (1642), when it was successfully defended by Sir Edwa Peyto on the Parliamentarian side, against the Earl of Northampto who was at the head of the army of the Royalists. Various specime of Norman work are scattered throughout the buildings.

The conservatory in the gardens (reached through the gateway b tween the towers before referred to) contains the celebrated Warwi Vase, which was found in 1770 at the bottom of a small lake Hadrian's Villa, near Tivoli, and purchased from the finder by t second Earl of Warwick. It is 5 ft. 6 in. in height, holds 163 gallo and is said to have been executed by the Greek sculptor, Lysipp who lived in the fourth century, B.C. The pedestal with the La inscription dates from recent times.

The best view of the Castle and town together is obtained from bridge on the Leamington road, which crosses the river Avon n the Castle. At the bottom of Mill-street is a pretty view of an mill just under the Castle walls. Cæsar's Tower could also be tak from this point, but the height is somewhat of a difficulty.

Mill-street itself is well worthy of a plate, the houses being for t most part of the old half-timbered type. The best view of it is to got from its lower end, looking upwards from the river, and the ligh ing from three to four p.m. In the Market-place are some more ha timbered houses, but these have, in all probability, been too mu restored in recent times.

Probably the finest example of old half-timbered house in t town is the old foundation known as Leycester's Hospital, which w founded in 1571 by Robert Dudley, Earl of Leicester, as a hospit for twelve old or indigent men, who are called brethren, and a maste In order to photograph the inner courtyard properly it should be a tacked in the morning, especially if the sun is out. The side opposi the gate is especially interesting, having in the centre the device the Bear and Ragged Staff, the cognisance of the Earls of Warwic and an animal resembling a porcupine, together with various crest &c. The Hospital contains several relics of antiquity, notably a Sax chair, said to be 1000 years old, the signature of the Earl of L cester, and a piece of needlework by the unfortunate Amy Robsa who connects the building with the town from which the expediti is made, since she met her death at Cumnor Place, 3½ miles west the city of Oxford, on the 8th of September, 1560, under most su picious circumstances, she being at that time the wife of Lord Robe

ey, favourite of Queen Elizabeth and founder of the Leycester ital. Amy Robsart is buried in the University Church of St. , Oxford, as is testified to by an inscription on the altar steps. are some remains of the old Manor House still to be seen at nor, and a ghost (presumably of Amy Robsart) is still said to the place. To this day the village inn at Cumnor bears the of "The Bear and Ragged Staff," a remnant of the former influ- of the Earls of Leicester.

return to the Leycester Hospital, this is situated at the junction igh-street and West-street, and over the point of junction, at- d to the Hospital, is an ancient gateway with a chapel over it. is older than the Hospital itself, it is the old West Gate of the formerly called the "Hongyn-gate." It existed before the reign of y the First, but its origin seems obscure. The building of the ital is much older than Leicester's foundation in 1571, as it was ally the Hall belonging to the united Guilds of the Holy Trinity he Virgin, and of St. George the Martyr, which date from the of Richard the Second. The front of the buildings and the vay adjoining make a splendid subject taken from High-street, possible, the morning light.

e Parish Church is a splendid building, mainly built in the Per- cular style. The Tower is very fine, and makes a good subject the street in the morning light. The Church contains various ments to notabilities, especially to the Earls of Warwick. There o a Chapter House and a Crypt. But the great feature of the ch is the Chapel of our Lady or Beauchamp Chapel, on the side of the chancel. This is a magnificent erection in the ated Gothic style, and is covered with rich tracery and carvings. s built under the will of Richard Beauchamp, Earl of Warwick, commenced in 1443 and completed in 1464. In the centre is the of the founder, Richard Beauchamp, with a recumbent figure unded by members of his family. There is also a gorgeously ed monument to Robert Dudley, mentioned before, and other nguished Earls of Leicester.

e Parish Church has suffered severely from fire, having been almost entirely destroyed—once in the reign of King Stephen, again in 1694. The Beauchamp Chapel fortunately escaped on econd occasion, together with the Chapter House and Chancel. he north side of the chancel is an entrance to the Crypt, where are three Norman pillars and arches. These are all that remain e old church built by Roger de Newburgh in the 12th century. ie crypt is an ancient "Cucking Stool," formerly used for the ction of ladies who were too free with their tongues, probably mmersion in the waters of the Avon.

e only other old church is that of St. Nicholas, in the street at name. The actual foundation of this church dates from be- the Norman Conquest, but it has suffered so much from destruc- nd subsequent restoration that hardly anything of the old building ins, and the present erection is architecturally valueless—it was built at the end of the 18th century.

her buildings worth mention in Warwick are the Priory at the of Northgate-street, which dates from the time of Henry de burgh, afterwards Earl of Warwick, who accompanied William of handy to England. It is built, however, on the site of a church cated to St. Helen) which was older still. Only a small portion enry de Newburgh's building now exists. The East Gate of the surmounted by a chapel, still exists, but has been completely d by restoration. Passing through the East Gate and continuing Smith-street there is, on the right-hand side, an old house known t. John's Hospital, of which the original foundation was estab- d by William de Newburgh, Earl of Warwick, in the reign of y the Second. The present building was erected by Nicholas ghton, early in the 17th century.

e-and-a-quarter mile north of Warwick, on the Coventry-road, is celebrated seat of Lord Algernon Percy, known as Guy's Cliff. house is situated on the summit of a rocky eminence, rising tly from the bed of the River Avon, which at this point forms a

The site dates from the early years of the Christian era, when pel was erected upon it by a bishop named Dubritius. The chief iety of the spot is in connexion with a renowned Guy, earl of wick, in the dim and distant past, who achieved various marvel- exploits during a pilgrimage which he made to the Holy Land, afterwards, being satiated with the world, settled down here to

The spot is wonderfully favoured by Nature with scenery of a ificent description, and is mentioned in case any one who has iously visited Warwick may like to journey further afield dur- he time that others are exhausting the beauties of the town.

amington derives its name from the River Leam, on the banks hich it stands, and which is here crossed by three bridges, con- ng the traffic of the town. It is a popular inland watering-place, has risen into popularity in consequence of the discovery of medi- prings. As these were only discovered at a comparatively recent it naturally follows that the town itself cannot lay claim to n in the way of antiquity. The following are its principal fea- s:—

e Royal Pump Room.—This, as being the cause of the prosperity of the place, may be thought worthy of a plate, but it cannot boast of anything like the antiquity of the similar institution at Bath. The oldest bath in Leamington dates from 1786.

The Municipal Buildings.—A handsome building in the Renaissance style, situated in the Parade, near the centre of the town.

The Parish Church of All Saints is a building in the form of a Greek Cross; it is built in the Decorated, Perpendicular, and Continental Gothic styles. It has a handsome reredos. It is situated near the Victoria Bridge, from which there is a good view over the River Leam.

The Old Well, close to the Parish Church, was the first spring to be discovered. A building was erected over it by the Earl of Aylesford in 1803.

The Parade is the principal street of the town, and winds through its centre, crossing the Leam at Victoria Bridge.

Kenilworth is reached from Leamington by the train from Milverton Station on the London and North-Western Railway. A walk through the village brings the visitor to Kenilworth Castle. The site of the Castle, the ruins of which are amongst the finest in England, was granted by Henry I. to his Chamberlain, Geoffrey de Clinton, who was subsequently Lord Chief Justice of England. Either he or his son, who bore the same name, erected the first part of the Castle about the year 1120. After various vicissitudes and many owners, of whom the most celebrated was probably Simon de Montfort, slain in the battle of Evesham, it was granted by Elizabeth to her favourite Robert Dudley, Earl of Leicester, during whose lifetime it became the scene of much gaiety, as has been woven into a romance in the pages of Sir Walter Scott's "Kenilworth." It is now the property of the Earls of Clarendon, to whose ancestor it was granted by Charles II.

The entrance gateway was erected in 1570 by Robert Dudley, Earl of Leicester, whose initials R.D. and badge are to be seen on one side of the porch. On arriving within the precincts of the Castle and crossing the green space in front, some of the oldest remains are discernible, viz., Lunn's Tower (left), Water Tower (left, farther off), Mortimer's Tower (front, farther off still), and the Gallery Tower (left of Mortimer's Tower and much farther off). But the most interesting portion of the building is within the Inner Court, on entering which is seen Cæsar's Tower on the right. This is a massive building, and the oldest portion of the Castle, having been probably built by Geoffrey de Clinton the second, about 1180. The walls at the base are 13 feet thick. There is one Norman window still existing; it is the ancient Keep of the Castle. On the same side are the remains of the Kitchens, attributed to John of Gaunt, and farther off is the Strong Tower, called by Sir Walter Scott "Mervyn's Tower," which was also built by John of Gaunt. At the west end of the Inner Court are the ruins of the Great Hall, which dates from the Perpendicular period in architecture, and measured 90 feet by 45 feet. It was lighted by four large windows on the west side and three on the east. At its south-west end was a large Oriel window with two or three lights. On the southern side of the Great Hall was the White Hall, and at its end the Presence Chamber, the latter having an Oriel window overlooking the Inner Court. All this was built by John of Gaunt. The Earl of Leicester erected the buildings on the south-east angle of the Inner Court. These occupy a space of 90 feet by 50 feet, and were occupied by Queen Elizabeth on her visit (introduced into "Kenilworth") in 1575. On this visit the Earl of Leicester spent what was then equivalent to £1000 a day in entertaining the Queen. The scale of magnificence on which the entertainment was conducted is shown in the novel. Many of the old buildings, including Dudley's Lobby and Henry the Eighth's lodgings, have disappeared.

There is the Gate-house near the Parish Church, which is a relic of the old Monastery for Black Canons, founded by Geoffrey de Clinton in 1120. It was founded as a Priory, but in the 15th century became an Abbey.

The Parish Church of St. Nicholas has some remains of Norman work. The nave dates from the 14th century, and it has a Lady Chapel on the south side. It possesses some old communion plate, the oldest being a chalice given by the Earl of Leicester about 1570.

REGINALD A. R. BENNETT, M.A.

THE CONVENTION.

THE following is extracted from an article on the Oxford Convention which appeared in our contemporary, "The Scotsman," of June 8. The article is signed by Mr. W. J. Croall, F.R.P.S. "Within the last five years photography has become increasingly popular with the general public, and it may perhaps be of interest to give some brief particulars regarding the Photographic Convention of the United Kingdom. The Photographic Convention was formed 16 years ago, with the view of making those interested in photography in different parts of the United Kingdom personally known to each other, and also

for the furtherance and advancement of photography. It is needless to say that this has been ably carried out, and perhaps never has the Photographic Convention of the United Kingdom been more prosperous and influential than at the present time. Meetings have been held during past years at Glasgow, Edinburgh, Dublin, Gloucester, Newcastle, Yarmouth, and other places. This year the Convention takes place at Oxford, and promises in interest to surpass any previous meeting. Sir W. J. Herschel has been nominated president, and will probably give a lecture on "Colour Photography." The Union Internationale de Photographie have decided to hold their annual gathering in connexion with the British Convention. It is also expected that Sir Howard Grubb will come from Dublin. The Oxford Camera Club, to whom the selection of the excursions have been left, state that the scenery chosen is extremely beautiful, and ranks with the best in England."

From Mr. F. A. Bridge, Hon. Secretary of the Photographic Convention of the United Kingdom, we have received a copy of the guide issued to members relating to the forthcoming meeting at Oxford. It is a guide de luxe, reflecting the very greatest credit on all concerned in its production. The photographic illustrations are well selected, and the text is both interesting and instructive. We note that the President-elect of the Photographic Convention is Sir W. J. Herschel, the retiring President being Mr. Thomas Bedding. The names of the members of the Council and those on the various committees are a guarantee of efficiency in the execution of their programme. Among the names of those down for reading papers we notice Professor H. H. Turner, F.R.S., and Dr. Moritz von Röhr; and, on the whole, we should say that in no more agreeable and useful way than this could one spend a week's photographic holiday in July. The address of Mr. Bridge, by the way, is East Lodge, Dalston-lane, London, N.E.—"The Optician," June 7, 1901.

THE GLASGOW INTERNATIONAL EXHIBITION.

III.

A PHENOMENAL spell of brilliant sunshine and dry weather for nearly a month has brought a large influx of visitors into the city, and in all the leading thoroughfares the hand camera is en evidence. There can be no question that the Exhibition is the main factor in this enormous influx of strangers from all parts of the world, and our local dealers are as busy as possible in consequence. As to the success of the Exhibition there can be no doubt. On every hand there is only one opinion, and that is that it is the finest thing ever brought together. Hence the enormous crowds which on several occasions have so taxed the accommodation as to call for the addition of further space, a demand which we understand is likely to be granted by the Corporation of Glasgow.

Among the numerous attractions provided by the Entertainments Committee there falls to be noted that of the British Mutoscope and Biograph Company, Limited, who have been entrusted with the biograph displays in the Grand Hall, a magnificent structure, capable of accommodating nearly five thousand spectators.

It may interest our readers to learn something about the arrangements of this unique display. A special fire-proof box has been erected on the front of the balcony opposite the stage, from which the films are projected by this company's well-known form of apparatus, so efficiently manipulated by Mr. Cables, a gentleman who stands in the very front rank in cinematographic work. This box is about ninety feet from the screen, and, by means of a clever piece of manipulation, and the opening of a large trap-door on the platform, the screen is rapidly elevated. The disc projected measures thirty-three feet, and some idea of the films displayed each evening between the hours of nine and ten may be formed from the following list, which formed the opening programme:—

1. Funeral of Queen Victoria. The Royal Mourners proceeding to embark, showing removal of pall from coffin and transfer from gun-carriage.
2. The Marble Arch Procession, showing Royal Mourners, and closing escort.
3. Windsor Procession, showing Bluejackets drawing the gun-carriage up to the Castle.
4. The First Procession in State of King Edward VII. Their Majesties the King and Queen proceeding to open Parliament.
5. H.R.H. Prince Edward of York executing Manual of Arms.
6. The Oxford and Cambridge Boat Race. The crew taking their boat to the water.
7. The Finish of the Oxford and Cambridge Boat Race. Oxford wins by two feet.
8. General Sir Redvers Buller's reception at Aldershot, showing his carriage being drawn by the members of the Fire Brigade.
9. Two of Britain's Heroes. Lord Roberts receiving Major-General Baden-Powell at Pretoria.
10. With the Flag to Pretoria. The Union Jack being hoisted Pretoria on the arrival of Lord Roberts.
11. Panorama of the Exhibition Opening Ceremony.
12. Launch of Sir Thomas Lipton's challenger, "Shamrock II.," Dumbarton.
13. At the Launch of "Shamrock II." Sir Thomas Lipton conf with Mr. J. L. Watson, the designer.
14. Speed Trial of H.M. torpedo-boat destroyer, "Albatros steaming at 32 knots an hour.
15. Picturesque scenery in Canada, taken from the front of a lo motive.

The electric light is used by Mr. Cables in the projection of the and some idea of the length of the films may be formed from t statement Mr. Cables made when courteously showing us the vario arrangements provided, viz., that his two drums contained at le one and a half miles of film. The entire apparatus is driven by el tricity, the whole arrangements being most complete.

Were any proof wanting in regard to the assistance which pho graphy now renders to the press, a visit any day to the "Press Bo of the Exhibition would at once satisfy the most sceptical. Here will be noticed that hardly a press representative puts in an appe ance without having control in some shape or other over a ha camera. This, no doubt, is the outcome of nearly all the daily pap making a rule to depict in some measure the various functions that continually passing by means of line work, and that makes it cumbent upon all reporters to understand the working of a hand came at least to a certain extent. Many of these exposures are dispatch to headquarters without delay along with the reporter's copy, a are then developed and reproduced by the staff of the newspaper. is quite surprising the rapidity with which a function is graphical portrayed by such means, a few hours sufficing for a fully illustrat report being published in the daily newspapers.

Public limelight lecturing in the month of June may appear to ma to be somewhat out of place. Yet this in reality is being carried o by the Executive of the Exhibition in the Grand Hall connected the with, and the venture has been attended with the most gratifyi success. A lecture of more than ordinary interest, and one whi is quite new to this country, is being delivered at frequent interva in several of the chief towns and cities in the kingdom by the Ho James Johnstone, M.D., of Jamaica, the title of the lecture bei "Jamaica and Britain's New Riviera." Dr. Johnstone is a brilli and racy speaker, and without doubt treats the subject only as o can who possesses more than a mere passing acquaintance with h subject. He claims that Jamaica is the finest island, and is possess of the best climate, in the world, and that in the near future it w hoped, seeing that a first-class line of steamers was being organized bring the Mother Country in closer touch with this possession of t Crown, to develop the many resources of the island, which ha hitherto been neglected. His lecture is brilliantly illustrated by fine series of transparencies. Arrangements, we understand, are progress for a further series of limelight lectures by some of the be known lecturers in the country. This looks like taking a leaf o of the book of the Glasgow and West of Scotland programme, whi proved so successful during the run of their recent photographic e hibition in the Fine Art Institute.

The vast throngs which nightly invade the Grand Hall to witness t biograph display (for thousands are turned away from the doo nightly) testify to the popularity of high-class animated photograp It is quite surprising the energy displayed by the company to prov up-to-date films and pictures. This was recently strikingly displa in their being able to show the accident to "Shamrock II.," w King Edward on board, within forty-eight hours of the occurren So great are the crowds nightly that it is thought some charge o and beyond that for admission to the Exhibition will require to made in the hope of curtailing the demand for admission.

The West of Scotland has always been looked upon as the favour spot for yachting studies, for the Firth of Clyde offers during t season opportunities for snap-shot work of this description to be m with nowhere else. The season has opened most auspiciously, the being several extra fixtures on the Clyde this season in connexion wi the Exhibition yachting competitions, in which the large sum of o thousand pounds has been expended for challenge cups. The first these competitions took place on the 7th inst., and it was a sig to see the number of cameras working on the Firth of Clyde during t day. Truly, photography is still popular.

It may be said with truth that there are two photographic exhibitio in connexion with this great undertaking, for, apart from the exhibi in the Fine Art Section (to which reference has already been made our columns), there is another collection of purely professional wor which, from a commercial standpoint, may be said to be unique, for is questionable if anything approaching such a fine display of pure commercial work by many of our best-known professional workers h ever been seen in the West of Scotland, and there is no doubt th display will during the run of the Exhibition attract the attention large numbers of professional workers as well as the public generall

e locale of this collection is the corridor which encircles the Grand ll, and, looked at either from a commercial or advertising point of w, this situation is at once highly suitable for the purpose to which as been put. No wonder, therefore, so many of the leading firms the West of Scotland were not slow to take advantage of the opportity afforded to exhibit specimens of their work.

Entering the Grand Hall by the door opposite the press box, it is at e apparent that an exceedingly telling display of high-class photophy has been collected in the corridor, there being numerous examples W. M. Warneuke, Messrs. Lafayette, Comrie Smith, John Fergus Largs), Messrs. Elliott and Sons, Messrs. Brinkley, John Stuart, nited, Messrs. Romney, Monsieur Monapenny, Messrs. Langfier, ssrs. Turnbull & Sons, and others, all of whom, it need hardly be said, represented by some of their best productions. The first thing to ike an observer on entering the Grand Hall after having inspected other collection in the Fine Art Section, is the vast contrast beeen this purely commercial display and the one he has just left. This evident not merely in the size of most of the examples shown, but ewise in the extreme care bestowed on the modelling and finishing the carbon examples. In striking contrast to many of the almost ignificant pictures displayed in the Fine Art Section, in so far as e is concerned, we have very numerous examples of enlarging to nost life-size, among which may be noticed a fine portrait of H.M. e King, by John Fergus, of Largs. This will be found hung on the cond landing just above the main corridor. This firm likewise show large collection of other work, all of which is well worthy of close spection.

Mr. W. M. Warneuke shows some fine examples of portraiture, and exceedingly interesting collection of enamels displayed in the tting and form of brooches. These remind one of hand-painted niatures of half a century back, and are really a very tasteful form ornament which may again become fashionable.

The Messrs. Lafayette have also a very strong display of portraiture, e of their best being the Countess of Tankerville and child.

Messrs. Turnbull and Son have a large exhibit, among which is a ry fine portrait of the Rev. John White. There can be no doubt out the excellence of this production, which at once rivets the tention of those having the pleasure of knowing this rising young vine in the Church of Scotland. This is perhaps one of the most riking productions so far as portraiture is concerned in the entire xhibition.

Comrie Smith shows some beautiful carbons on opal, one of the best ing a charming group of five children. This is of great excellence om every point of view.

M. Monapenny also has a fine exhibit, which is characterised by a rong individuality that many who have discarded the use of white argins in their framing would do well to study.

Messrs. Stuart, Limited, show a varied collection of all-round work, nong which are a few examples of what can be effected by flashlight oth in portraiture and architectural subjects.

It must strike a close observer that in nearly every instance carbon as been selected for these high-class productions, and that for show r exhibition purposes nothing is so telling as a well-finished enlargeent in pigment, such as sepia.

It has occurred to several prominent photographers on viewing this ne collection that were an International Exhibition organized of purely rofessional work, it would attract a large amount of attention om the public generally, and be a fine set-off to many of the amateur xhibitions which have done so much to foster a fuzzy out-of-focus lass of work, which, judging from the professional work shown in this nstance, finds no place with the firms mentioned, or favour with the ublic either, who desire at least some show of a good likeness in ortraiture.

News and Notes.

Before the members of the Hackney Photographic Society on the 4th nst., Mr. A. Mackie gave a lecture on the "Theory and Practice of Fixing nd Washing Negatives and Prints."

The Edinburgh Photographic Society (which has at present a membership of over 500), held its forty-first annual meeting on Wednesday, June 5. Office bearers were elected as follows:—President, Mr. James Burns; Vice-Presidents, Messrs. J. B. Johnston, David McArthy; Secretary, Mr. J. S. McCulloch, W.S.; Treasurer, Mr. George Cleland; Curator, Mr. John Anderson. Messrs. J. C. Lennie, F. P. Moffat, Jas. Craig, R. S. Webster, J. Murdoch, and W. J. Crear were elected to fill vacancies in the council.

No Plastic Psychological Syntheses in Charing Cross-road.—Alluding to the members' exhibition now on view at the Camera Club, the editor of the "Club Journal" rejoices that amongst the collection there are no misty-headed women in corsets seeking relief from insomnia in midnight sonatas; no bisected specimens of lank humanity in severely simple surroundings and an exaggerated déshabille, the "responsibility" of which (as the schoolboy defined it) depends on a single button. Personally, he adds, we are Philistine enough not to regret the absence of these hot-house products.

The Lumière North American Company.—Presiding over the statutory meeting of the shareholders of this company held in London on the 6th inst, Mr. L. White stated that the services of a capable works manager for the company's business in North America has been secured, and the chairman has decided to proceed to the United States for the purpose of establishing a factory for the company. There was no resolution before the meeting, the proceedings being of a formal nature, simply to comply with the Statute.

Making a Box on Wheels.—Mrs. Rejlander, of 18, Colls-road, Peckham, London, S.E., writes: "Will you kindly let your correspondent H. F., who wrote last week, re making a box on wheels, know that I have a professional's portable dark room tent box, with solid folding tripod stand; this stand he could use for his camera, and the dark room can be fixed on wheels without any alteration whatever. It shuts up, lock and key, drawers, &c., all up-to-date, for wet or dry process, cost £3 5s. Your correspondent can have the same for £1."

Ammonia for Whisky.—According to a report printed in our contemporary, "The Pharmaceutical Journal," an inquest was held at Jarrow Police Station on Friday, May 31, concerning the death of Ellen Ruth Walkinshaw (31), wife of an engineer at present in Australia. The evidence showed that on March 22 deceased complained of pains in the stomach, and, in mistake for a spoonful of whisky, she swallowed a spoonful of liquid ammonia. She became ill, and was medically attended until May 30, when she died. The medical evidence was to to the effect that death was due to difficulty in swallowing owing to the throat being burned by liquid ammonia, and a verdict in accordance with that evidence was returned.

The excursion arranged by the South London Society to the Shannon and Galway is fixed to start on July 11 next, under the leadership of Mr. Churchill. The cost is estimated at £7 7s. The journey to Ireland will be via Holyhead. After breakfasting, the journey will be continued westward, and a stop made at Athlone, where a sailing boat has been engaged to take the excursionists on a visit to the Islands of Loch Ree, and on the following day to the Seven Churches of Clonmacnoise. After spending a day in Galway, a drive will be undertaken to Headford, twenty-one miles—via Clare, Galway—where a short stop will be made. Next the party drive on to Cong, where two nights will be spent, and the neighbourhood will no doubt be well photographed. A sailing boat will take the trippers to Oughterhard, visiting the islands of Loch Corrib en route. After staying the night a special conveyance will meet the party and drive them back eighteen miles to Galway. On the closing day of the outing it has been arranged to spend some time in Dublin, and to dine late before joining the nine p.m. boat from North Wall. Mr. Churchill, of 5, Annandale-road, East Greenwich, S.E., will be pleased to hear from any brother photographers who may desire to join the party, or to furnish any further details which may be desired.

Mr. James Glaisher.—Our contemporary, the "Daily Telegraph," in its Science Notes, of Monday last, had the following sympathetic reference to the past president of the "Parent Society":—"One of the most interesting of our surviving men of science is Mr. James Glaisher, F.R.S., who recently entered upon his ninety-third year. Many people think of the veteran meteorologist only as an aeronaut, on account of that memorable and unparalleled ascent which he and Mr. Coxwell made nearly forty years ago. But Mr. Glaisher is not an aeronaut, though he has made some thirty ascents skywards for scientific purposes. He is a meteorologist, astronomer, and mathematician—and a fine sample of what a vigorous mind in a sound body can do—hale and hearty at over ninety-two. When he and Coxwell did their seven miles rise into the empyrean, and he fainted, and the aeronaut only saved both of them by gripping the valve-rope with his teeth—his hands being numbed and powerless—the world was greatly moved with admiration. At the meeting of the British Association next year, 1863, Professor Owen made a noteworthy statement. 'Physiologists,' he said, 'were all agreed that one condition of longevity was the capacity of the chest, and, therefore, he hoped the increased breathing capacity acquired by Mr. Glaisher and Mr. Coxwell would tend to the prolongation of their lives.' The kindly wish was prophetic. Coxwell died in January, 1900, in his eightieth year; Glaisher still survives, and is ninety-two! He has a son, Dr. Glaisher, F.R.S., of Trinity College, Cambridge, President of the Royal Astronomical Society, and a distinguished mathematician."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
17.....	Walthamstow Photo.....	Ordinary Meeting.
18.....	Gospel Oak	Demonstration: *Lantern Slides by the Carbon Process.* H. H. Morgan.
19.....	Birmingham Photo. Society ...	Excursion: Kenilworth. Leader, F. Lewis.
19.....	Borough Polytechnic.....	Monthly Print Competition.
20.....	London and Provincial	Open Night
22.....	Borough Polytechnic.....	Excursion: Zoological Gardens. Leader, F. W. Bannister.
22.....	Bradford Photo. Society	Excursion: Knaresborough.
22.....	Croydon Microscopical Society	Excursion: Woldingham and Oxted. Conductors, Messrs. Mennell and Robarts.
22.....	Liverpool Amateur.....	Excursion: Bakewell and Millersdale. Leader, Jas. Parkinson.
22..... ...	Walthamstow Photo.....	Excursion: St. Albans.

ROYAL PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, June 11,—Mr. Thomas R. Dallmeyer, F.R.A.S., President, in the chair.

General Business.

Seven candidates for membership were proposed, and six candidates were elected members of the Society.

It was announced that the North-West London Photographic Society had been admitted to the affiliation.

The President announced that the following members had been admitted to the Fellowship:—Messrs. Charles Churchill, Charles F. Inston, Philip Reid Mackenzie, Thomas Cunningham Porter, and John Stuart (Glasgow).

The Society has lost by death one of its original members, Mr. George Shadbolt, who joined in 1853; and Mr. George Mason, of Glasgow.

Dr. Moritz von Rohr presented in the name of Messrs. Zeiss, of Jena, a fine example of a Chevalier lens, working at about *f*-15. An account of this lens has been already given in these pages a short time back.

During the meeting a letter was received by the President announcing that the Queen had been pleased to grant her patronage to the Society.

Mr. Thomas Bolas presented a piece of apparatus known as the Claudet focimeter, which was used to determine the difference between the actinic and the visual foci of the lens—a very necessary thing in days gone by, when correction had not been carried to the state of perfection in modern instruments.

Five Years' Work with X-rays.

Mr. Wm. Webster read a paper dealing almost entirely with his own very extensive experiences with these rays or vibrations, so intimately connected with light, heat, electricity, sound and chemical action. An interesting account of the work of scientists prior to Rôntgen's discovery, but in the same field, was given. Due credit was given to the ancient Greeks, Romans, and Egyptians, for their elementary acquaintance with frictional electricity. The earliest experiments with electric discharges in vacuo date from about 1560, when it was noticed that on rapidly raising and lowering the mercury column in the barometer tube in a dark room a luminosity appeared in the vacuum portion of the tube. Hauksbee and Davy worked on lines which bear also upon Röntgen's discovery of 1896, and De la Rue performed some extraordinary work that has since been repeated, as new, by certain people young in science. Geissler, Muller, Spottiswoode, and Sir William Crookes, and their contributions to our present knowledge were in turn touched upon. Crookes very narrowly missed the discovery of the rays emanating from his tube that Röntgen came across, for having a box of bromide plates near one of his tubes he found after using them for some other purpose that they were most mysteriously marked. But concluding that the plates were defective he thought no more of the matter. Prof. Jackson made his well-known tube in 1894, and demonstrated that materials such as wood, vulcanite, &c., were transparent to the rays that issued from it. The day after the announcement of Prof. Röntgen's discovery, Mr. Webster was at work with the new rays, assisted by Mr. Thomas Moore. The first results were poor, but two or three Crookes' tubes having been obtained, the results were more satisfactory. Jackson's tube, next used, gave a perfect shadow record of a hand in seven minutes. Mr. Webster found that exposure was shortened by some minutes by heating the tube, and did a considerable amount of work in this direction. It is impossible to give a full account of the lecturer's work in this space. He went on to show the progress that followed his continued efforts, illustrating his remarks with lantern slides of his work from the early days of 1896, to the present time. He devoted himself very enthusiastically to surgical work, and later to the treatment of lupus cases by X-rays which have been shown to in all cases relieve, and, as a rule, cure the affection. He went on to compare the method with the "light" cure which is imperfect, expensive, and tedious. To sum up his five years' experience he could only say that whether for diagnosing disease, accidents, or for alleviating or curing skin and other complaints, the rays were of the utmost importance to the medical world.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 6,—Mr. T. E. Freshwater in the chair.

Mr. A. L. Henderson related some of his experiences with Tanquerey, the Parisian whose well-known circulars offering cheap copies and enlargements of photographs are so freely distributed in this country. Some time ago Mr. Henderson decided to try the firm by sending a photograph for copying. In due time he was informed that the copy was finished, but with the notification came patterns and prices of frames. Mr. Henderson took an opportunity that offered to visit Mr. Tanquerey in Paris, and asked for his picture, which was supposed to be done. He was told, however, that it was not done, whereupon he asked for an explanation of the letter stating that it was ready. The modest damsel interviewed blushed when the falsehood was discovered, and was lectured severely upon the subject. The police, who were interviewed, stated that they were continually being approached respecting Tanquerey's proceedings, but that there was no ground upon which he could be prosecuted.

Mr. J. E. Hodd passed round one of the new Watkins "Dial" exposure meters which he looked upon as a capital and original piece of apparatus. There was only one set of figures visible. The actinometer time is measured by the exposure of a section of the paper in the ordinary way; the meter is set to the stop and plate used, and then the proper exposure is read off. A chain pendulum indicating seconds is attached to the meter.

Mr. S. H. Fry said that the principal trouble that he had met with was that of judging when the paper had acquired the tint of the colour patch on the instrument.

Mr. Hodd replied that there was no difficulty provided the sensitive paper were in good condition.

Mr. Henderson always considered that these exposure meters were for amateurs, and even then during a long exposure how was the almost certain variation of light actinism, or the difference caused by passing clouds, to be allowed for? Anybody boasting a little experience should be above using such things.

Mr. Fry said that he had used exposure meters chiefly in order to see whether, in common with other new methods introduced into photography, for which chief credit was due to the amateur, this method was of value. He had absolutely no doubt in his mind that a man taking up photography and using a Watkins' meter would be able to do as well as many a photographer who could boast of long years' experience.

Mr. P. Everitt testified to the same effect by quoting the case of a beginner who adopted the exposure meter at the expense of some ridicule from his more experienced friends. Ultimately, however, these same critics were compelled to adopt the use of the meter.

Mr. W. Thomas alluded to the difficulty many found of matching the tint of the sensitive paper with the coloured patch on the exposure meter. It was in attempting to do so that the blunders arose. It was never intended that one should match tints, and if, as he did, one compared only the depths of printing the difficulty of matching two things, the tint of one of which varied with the humidity of the atmosphere, was entirely removed. Again, many poor results were due to an almost total disregard of the "colour" factor of a landscape. The personal judgment that was required to decide the exposure for two "open landscapes"—one moorland with heather in bloom, and another an expanse of wet sand—was also considerable, whereas under the scheme of classification many were induced to regard them as similar and requiring identical exposures. The developing factor was often entirely neglected, but it should be remembered that one developer does not in every case do what another will do, and one must test the particular developer in use.

Mr. Walter D. Welford read a paper entitled—

Man versus Apparatus.

Photography, he said, was born in optics, cradled in science, nursed in chemistry, and its childhood's days spent in fruitless discussions upon art—that is as regards the Artist with a capital A, but very fruitful from the pictorial point of view. No better example of kicking over the traces was to be found than in the pursuit of photography. As soon as we were old enough we threw all our training to the winds and endeavoured to foster the pictorial side which alone allowed one to impart individuality to our work. The optical, chemical, and scientific aspects of photography gave little scope for any thing but skill, but the pictorial aspect was not a question of money or influence, but a perfectly open door to rich and poor. Scientific research without means may be well-nigh impossible, but the same was by no means the case with pictorial photography. The reader of the paper proceeded to argue that poor apparatus was no obstacle to success and that excellent appointments on the other hand were of little avail if one knew not how to use them. One relied upon his work and himself, the other upon his apparatus.

Mr. Welford believed that if a census of the best workers in photography were taken it would be found that their success was due very often to home-made apparatus. Finally, he said, that he did not want photographs by apparatus but photographs by men.

An interesting discussion that challenged several of the author's statements was started, Mr. Hodd, Mr. Henderson, and Mr. Thomas participating.

PHOTOGRAPHIC CLUB.

June 5,—Mr. A. Mackie in the chair.

Mr. F. A. Bridge communicated the sad news of the death of Mr. George Mason, of Glasgow, that afternoon, at 5.30, which he had just learned by wire. After some sympathetic references to the illness that the late gentleman had suffered from, and to his long connexion with photography and things photographic, Mr. Bridge moved that a vote of sincere condolence be sent to the widow and family of the deceased in their bereavement.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PRICE CUTTING AND THE KODAK'S POLICY.

To the Editors.

Gentlemen,—I am as much opposed to the recent action of Kodak, Limited, as Mr. J. A. Reid, but if he and the dealers have no better ground to stand upon than that which they claim, they will ignominiously fail to elicit the support of the public in their favour. Were it not deplorable in the interest of photography, it would be amusing to watch the advocates of "no coercion" standing first on one leg and

n on the other. It is tyranny when they are told they must not l any other than Kodak rollable film, but when we come to the tation of the Manufacturers and Plate-makers' Association, with ir refusal to supply any dealer who sells under list price, tyranny l coercion disappear from their vocabulary and we hear of protection the interests of the public. This is rank hypocrisy, and epithets h as "price cutting," "the supply of American goods," and pro-sions of "desiring to maintain the best possible standard" and tudying the convenience of the public," are a mere pretence for ping the trade in the swaddling clothes of large profits and small urns.

f it is wrong for Kodak to strangle enterprise in manufacture by luding all kinds of rollable film but their own, is it not equally ong for the Manufacturers and Plate-makers' Association to exclude erprising men of business who think they are serving the public by ing at a lower rate of profit? At the present time dealers' fits are extravagant. In many instances the mere distribution of article yields a considerably higher profit than the manufacture, d such is the spirit of the dealer, I am sorry to say, that I find n frequently slurring goods of high quality, or holding them back, order to push the sale of others upon which he gains a slightly ger profit.

To bring the matter home to Mr. J. A. Reid, I will make a few bal alterations in the latter part of the second paragraph of his ter, which might run as follows:—"In the eyes of the Plate-makers' sociation, any dealer who places on the market an efficient article, d sells it at less price than other dealers, is a price cutter. Surely needs no pointing out that the cost of distribution may be less, d the dealer also may be content with less profit? If the new aler's system offers no advantage, he will soon learn that it is not rth while continuing it."

If the dealers wish to fight this battle on the ground of freedom of de they must come before the public with clean hands and say od-bye to "the ring."—I am, yours, &c., ANTI-COERCION.

"Anti-Coercion's" antipathy to the Plate-makers' Association, or ring," as he prefers to style it, may be appeased by the informa-n, which we have received on excellent authority, that the Asso-tion is practically non-existent.— EDS. *B.J.P.*]

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—I notice you have coupled my name in the list of mbers of the P.P.A. with a Mr. Green, and left my own and my rtner's out as members. The said Mr. Green has no connexion with I trust you will alter this.—I am, yours, &c.,

(pro Biddle and Dowdall), L. DOWDALL.

49, King William-street, E.C., and 1, Ondine-road, East Dulwich, S.E., June 7, 1901.

KODAK, LIMITED, AND THE TRADE.

To the EDITORS.

GENTLEMEN,—I enclose you report of the resolution passed at the t meeing of this Association, and should be obliged if you will note ne in your valuable columns.—I am, yours, &c.,

P. C. CURTIS, Hon. Sec.,
The Photo Trade Association of Ireland.

Dublin, June 6, 1901.

At a meeting of the Photo Trade Association of Ireland, held at ry's Hotel on May 10, the following resolution was passed unani-usly:—"That we feel pleased to note that the Kodak Company, in eir last trade circular, and letter marked private, which was received the various members of our Association, that they have practically thdrawn from the ridiculous position they had attempted to assume, d we recognise their caving in as an evidence of the advantages to obtained from trade associations such as this."

[The Kodak Trade Circular for June remarks:—"It is in our alers' interests to know and spread the truth about our conditions sale. We only wish them to face this matter squarely as a siness proposition. Their interests are bound up with ours in rrying out this condition of sale, and not with those whose pro-amme leads to the cutting of prices, to the diminution of trade in llable film photography, and to the reduction of the dealers' profit. ıe truth about our conditions of sale has only to be fully under-ood both by dealer and consumer to ensure their appreciation of advantages for them." In support of the condition of sale letters om twelve dealers are printed. In another part of the circular it said, "The more the name Kodak resounds over the world the ger the demand for Kodak goods." Certainly the name Kodak has resounded a great deal during the last few months, and the circular blandly acknowledges indebtedness to much free and unintentional advertising. If we read the circular aright it is tantamount to a "withdrawal" of the condition of sale. The company admit an increase of business equal to 33 1-3 per cent., and we hear on all hands that the trade in films is brisk. Quoting from the Jackdaw of Rheims, "nobody seems one penny the worse;" all things considered, a very happy state of affairs indeed.—EDS. *B.J.P.*]

SCREENS FOR THE McDONOUGH-JOLY PROCESS.

To the EDITORS.

GENTLEMEN,—Re the letter in your issue for June 7 from Mr. J. S. Shearer on "Screens for the McDonough-Joly Process," I may say that I was very interested in Mr. Shearer's letter, and the idea which he proposes is a very interesting one from the experimental point of view. I have myself made some notes on this method of producing these linear colour pictures, and also on several other points, which I hope to try in the future, but I have not yet had time to do any work on them. Of course, the objection to the method is that it involves a series of operations which would only complicate this process, and it is this complication which it has been the endeavour of the International Colour-Photo Company to obviate.

As regards the variation of the colours, there cannot be any doubt that the colours of the viewing screens and the taking screens must be adjusted to a recognised theory of colour analysis. The present system, which is employed by the International Colour-Photo Company, and which gives such eminently satisfactory results, is, as far as I can determine, the method which has been worked out by Mr. Ives, and I may say that this is the theory which I support entirely.—I am, yours, &c.,

A. V. KENAH.

2, Eliot-hill, Lewisham-hill, Blackheath, S.E., June 8, 1901.

METOL DEVELOPMENT.

To the EDITORS.

GENTLEMEN,—I have lately been using a metol-hydroquinone developer for film negatives, and find that the skin on both my hands is gradually peeling off, accompanied by a very uncomfortable sensation, something resembling that produced by bad chilblains. As I have read that a metol developer causes sores on the hands, I conclude that is what has made mine in the state they are.

Would it not be as well to warn all photographers of this somewhat awkward characteristic of metol, which I conclude must be a corrosive substance? A curious thing is that I have used the metol hydroquinone developer before without any harm arising, but at that time with glass plates; therefore it seems to me that something in the composition of the celluloid films is partly accountable for my sufferings.—I am, yours, &c.,

AMATEUR.

PRACTICAL TRICOLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In your report of the proceedings of the Royal Society, under the above title, there is an error, which please correct.

The paper is by Mr. Guy Symmons, in conjunction with myself, not by myself alone. It is the more necessary that this should be accurate, inasmuch that the paper is, I believe, the first published practical process in which full working details are given, and the enormous amount of work involved in elucidating these details is almost entirely the result of Mr. Symmons's enthusiasm and untiring energy.—I am, yours, &c.,

HOWARD FARMER.

307, 309, 311, Regent-street, London, W., June 10, 1901.

THE STORAGE OF SENSITISED CARBON TISSUE.

To the EDITORS.

GENTLEMEN,—You have from time to time been in the habit of advocating the merits of the carbon process in the columns of your JOURNAL, and we think your readers will be interested in a novelty of considerable utility in connexion with the process we have lately introduced.

One of the drawbacks of the carbon process has been that the tissue, once sensitised, would only remain in working order for a very limited time. Early experimenters have traced this decomposing action to the presence of moisture, and it was believed that, could the moisture be effectually removed, the process of insolubility would be arrested.

With the object of arriving at favourable conditions, we made the experiment of storing tissue in a flat box with chloride of calcium, and the results were so successful that we ultimately perfected the apparatus and introduced the box, of which we now send you a specimen.

The tissue is stored under pressure, and kept flat (a very important point), and as the inner fitting does not in any way press on the outside of the box, the close fitting of the lid is not interfered with. The small perforated receptacle is filled with calcium asbestos wrapped in a piece of soft material or cotton-wool.

The specimens accompanying the box speak for themselves. The tissue upon which they were printed was made sensitive on Feb. 18, and these copies were printed and developed on June 8. The tissue behaved in precisely the same manner as freshly prepared material. We are receiving many flattering testimonials in respect of this storage box, and enclose a couple for your perusal.

Should you desire it, and will return the box, we shall be pleased to place it in some sensitised tissue, to be sealed up for, say, three months, and tested by you at the end of that time.—We are, yours, &c., The Autotype Co. (C. Sawyer).

74, New Oxford-street, London, W.C., June 11, 1901.

[We shall have great pleasure in testing the tissue to be stored in the box, as suggested by the Autotype Company. The box, a specimen of which is before us, consists of a separate inner fitting provided with strong springs so that the cut pieces of tissue are kept quite flat, and a receptacle for the desiccating compound. The whole is enclosed in a closely fitting japanned tin case, and a wide indiarubber band makes it practically air tight. The company send us two original letters testifying to the practical utility of the storage tin. Both gentlemen successfully printed on sensitised tissue that had been stored in the box for over three months. The four specimen prints referred to were made on tissues sensitised on February 18, and preserved in the box, and were printed and developed on Saturday last, June 8. The tissues were treated in the ordinary way, and behaved, we learn, exactly the same as freshly prepared material. The excellent qualities of these prints, which are beautiful pieces of carbon work, amply show that the tin should prove of the utmost convenience and reliability for the safe storage of sensitised tissue.—Eds. *B.J.P.*]

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

G. Milne, 45, High-street, Turriff, Aberdeen. *Photograph of presentation bowl.*

T. Reveley, Market-place, Wantage, Berks. *Photograph of malformed colt's foot.*

E. J. Denney, The White House, North Walsham, Norfolk. *Photograph of landing the German cable.*

Book on Retouching.—E. B. asks for "information of the latest book on retouching."—In reply: The last and probably the best book published on the subject is that by Mr. Robert Johnson. It is obtainable of Messrs. Marion, Soho-square.

Books on Photography.—"Urgent" writes for "the names and addresses of some publishers of good books on 'Photography,' and their prices. He wants a book that deals with all sections of the art."—In reply: At pp. 662-663 of The British Journal Photographic Almanac, for 1901, we give a list of suitable books, with their prices, which may be ordered of most photographic dealers.

Tones on Velox Papers.—"Tint" writes: "Will you kindly tell me of a developer by which I can obtain on Velox papers the tone as seen on strips from a print here enclosed?"—In reply: The strips sent were so small that we could not realise, exactly, what the actual colour is. However, if you will write to Messrs. J. J. Griffin and Sons, Sardinia-street, W.C., they will send you a small pamphlet describing how you can get a great variety of colours on Velox.

Removing Silver Stains.—W. Walker writes: "I lent a friend some months ago a quantity of stereo negatives, some of which I prize very much. He has returned them to-day, and a great many are covered more or less with silver stains, which renders them quite useless for printing. How can I remove these stains?"—In reply: Some stains are difficult, if not impossible, to remove. Without seeing the negatives we can hardly say which is the best method to try. However, we should advise you to rub the negatives over with a weak alcoholic solution of iodine, and then when the stains appear white "fix" the negatives in a solution of hyposulphite of soda.

The Half-tone Process.—"Views" writes: "How are half-tone pr cess blocks made? Is there any book published giving full i struction?"—In reply: To describe the process, even in abstra so as to be useful, would take up very much more space than c be afforded in this column. Better get Verfasser's work on t subject. It may be obtained from Messrs. Dawbarn and Wa Farringdon-avenue, E.C.

Stripping Negative Paper.—"Xonk" writes: "Will you kindly give r the cause of my failure in stripping Wellington negative pap sensitised on a bichromate bath on to a glass plate; have tried t ordinary way, as a carbon, but the whole thing puts off again?"— reply: We certainly do not understand this query, or why t Wellington negative paper was sensitised on a bichromate bat It is, of course, sent out ready for use. Evidently a mistal somewhere.

Showcase Lining.—"Showcases" asks: "(1) What is the best materi to use for the lining of showcases, and the colour best suited f the effective exhibition of photographs? (2) Would the pap enclosed be suitable? If so, it could be frequently changed."—I reply: (1) As a matter of fact, there is no "best," because it is much a matter of taste, as well as the colour of the photograp to be shown upon it. Velvet, or plush, of a tint to suit the phot graphs is very generally used. (2) The paper would certain attract attention, if nothing more. It would, however, kill th photographs put upon it, by reason of its colour.

Ferrotype Photography.—"Ferris" writes: "I am wishing to mak a 'barrow' for ferrotype photographs (wet plate), could you gi me a description how to make one? Do you have a black clot fixed to the lid? I should like to know a few details of the late sort of 'barrow.' Can you tell me any firms that supply same? In reply: We regret we cannot give the latest form of barrow We were almost under the impression that they were nearl extinct. Most of those that are used are constructed by, or to th design of, those who use them. Generally they are a box o wheels with a hood attached to the lid sufficiently large and lon enough to cover the operator while at work. Messrs. Fallowfiel make a speciality of ferrotype appliances, and they might possibl get a barrow constructed for you.

Various Queries.—W. K. writes: "(1) I have a Cooke lens, and by in serting a lens at the back, made the full aperture, viz., *f*-6.5, be come *f*-4. Does this increase the speed, or does the extra glas shut off too much light to do so? (2) If I make a negative o bromide paper (platino-matt), can I render the same translucent in order to print from the same? (3) What is the best and most permanent method of toning bromide prints sepia?"—In reply: (1) If the aperture is not reduced by the supplementary lens its speed will be increased to an extent, as the light absorbed by the additional lens will be but trivial. (2) Yes, by any of th well-known methods, such as treating it with castor oil, vaseline paraffin wax, beeswax, &c. (3) We should be sorry to vouch for th permanency of any of the methods of toning bromide pictures to sepia tone. The most generally used are the uranium and the alun methods.

Residues.—G. Wood writes: "Will you kindly oblige with your opinio through The British Journal of Photography, as to whether have been 'done' in the following transaction? I gave into th hands of the local 'goldsmith and jeweller' three and a half pound of sulphide silver, and ten and a half ounces of pure chlorid of silver. I have received from him only thirty shillings an ninepence for the lot. Now, when I used to recover my ow residues I found the sulphide to be extremely rich. The presen three and a half pounds were washed in two or three changes water, carefully and thoroughly dried and powdered, and all e traneous matter removed. The chloride was thrown down fro strong solution by HCl well washed, and carefully and thorough dried. Would not the chloride alone be worth the thirty shillings? In reply: We think you ought to have received more, supposin of course, that both the sulphide and chloride were pure, unless large sum was deducted for reducing. But the waste that i often sent by photographers, and supposed by them to be pure, i often far from being so. You are quite in error in supposing tha the ten and a half ounces of chloride, if it were pure, would b worth thirty shillings. At the present price the standard metal i only worth about two and sevenpence half-penny per ounce.

Bichromate Poisoning.—"Carbon" writes: "About four months ag I started doing carbon work, and in sensitising the tissue wit bichromate of potash I have poisoned my blood (so my doctor says) He does not seem to know the cure as I am getting worse. At first i broke out on my hands, and this week it is coming out on m face and around my eyes to an awful extent. The rash burns an itches very much, and I cannot sleep at night. If you could giv me a cure or any advice on the subject I should be most gratefu to you."—In reply: If you are suffering from the effects of bichro mate of patash, it is in a different form from anything we have heard of before, and we are inclined to doubt if your trouble is due to the bichromate at all. So far as we are aware, and can learn from those who have suffered from its effects, the trouble is quite local, and mostly confined to those parts which come in contact with the solution, and extend no further. We should advise you to con sult a specialist in skin diseases. He will probably locate the trouble to some other cause.

*** Owing to exceptional pressure on our space this week, we are obliged to hold over many answers to correspondents, reviews, editorial table, and other matter.

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EX CATHEDRÂ.

Standard Silver. The price of silver for many years past has been so much below the value obtainable for long time prior to the "slump" in silver, that all the old as about standard silver will have to be remodelled. In e memory of many living photographers the price of the tal closely approximated the Mint value, i.e., five shillings d sixpence per ounce—a startling contrast to the present ce of twenty-seven and a half pence. Naturally the price nitrate of silver follows suit, and also the actual cost of the king of a dry-plate, so far, that is, as regards the chemicals ed. Yet, in 1893, silver cost on the average thirty-five e-eighths pence per ounce, and in 1890, forty-seven three-arters. It is thus seen that silver only costs, at the present ne, very little over half its price eleven years ago. But do not hear that the prices of dry-plates have been correspondingly reduced. No doubt we shall be reminded that the price of silver has come down, that of glass has gone to a very marked degree. With some plates this reduction would not actually amount to much, the silver in them being present in almost infinitely small quantity, though in other brands the plates are "fat" in salts of the precious metal. When the price of silver coin, like gold, represented the value as stamped pieces of bullion, the coins were found to be melted down for the purpose of making articles of silver plate. This being an injury to the Revenue an act was passed in the reign of William III., enacting that plate should be made only of silver of a higher quality than the coin of the realm; but in practice it was found that such metal was too soft to stand the necessary wear and tear, so that in George I.'s reign another standard was fixed, and two standards were permissible concurrently respectively of 92.5 and 95.9 per cent. Hence, if one desires to convert old pieces of plates into nitrate he must take into account the existence of these two standards when estimating the amount of nitrate he ought to obtain. Sovereigns—containing each a pound's worth of gold—can be made into chloride without loss, but if silver coins be used there would be a loss of over one-half their value, as the silver coins are sold, so to speak, at five shillings and sixpence per ounce.

* * *

Dilution of Acetylene. One of the causes of the comparatively small number of acetylene installations established in this country is the difficulty often experienced with the burners; they are so apt to get choked up with carbon. It has been found that if the gas be diluted with another inert gas this effect is not produced, and numberless methods have been devised and patented for carrying out the idea in practice. Virtually, however, they have hitherto been failures in practice. Quite recently Herr Albrecht Heil, of Frankfort-on-the-Main, has proposed still another method—the passing of the acetylene through light petroleum spirit or gasoline, so as to saturate it with the vapours of that body after the manner of making water-gas. Therefore the duty of the acetylene is not unduly decreased. The explosibility, which presumably means the range of explosive limits of the diluted gas, is lowered. There is no likelihood of adding air to the acetylene during the dilution. There is no tendency either to

blacken mantles if used, or choke up the burners. It is further claimed that the mixture with petroleum vapour does not tend to produce that extreme brittleness of the mantles that characterises the use of pure acetylene, and, also, that when exploded the intensity is not so great, so that for gas engines the ignition is slower and more gentle than with the pure acetylene. As the "Engineer" says, "If further experience should bear out these claims, the process of diluting acetylene in this fashion is one that could be easily employed by every country consumer. In all other methods of dilution, more or less complicated and, sometimes, power-consuming plant is necessary even when the second gas happens to be available or ready prepared. Here all that is needed is a special vessel following the purifier, containing no moving part, needing no regular attention. . . . The process would not be very expensive to use, since the density of incandescent acetylene, even diluted in this manner, is rather more than twice that of the luminous gas." We may be quite certain that the method will have a fair trial in this country, and as the enterprise of those who are exploiting acetylene is great, there can be little doubt that special apparatus for impregnating acetylene with petroleum vapour will be put upon the market before long.

* * *

The Future of the Professional Photographer. We recently referred to a very characteristic incident, narrated by Dr. Miethe, with regard to the improvement of the position of the professional photographer. We trust that the success attending the organization of the Professional Photographers' Association, will not induce its members to believe that their services can be placed on a higher level of public appreciation by the means within its scope, apart from individual effort of an entirely different character. If photography is to take a higher rank, and there is no reason why it should not, it must be through cultivation of artistic taste on the part of photographers themselves. There can be no doubt that the public has lost its taste for the styles of the past, still largely prevailing amongst professional photographers. We often hear lamentations, in the form of regrets, for the good old times when the "carte de visite" and "cabinet" took the public by storm. That happy union of circumstances lifted many photographers to affluence. But although we do not see the prospect of the advent of another wave of fashion bringing wealth to the feet of professional photographers, we do believe that men of business ability, who study the better tastes of the public, may still find in photography a very remunerative profession. The causes which have brought a large number of businesses to low ebb are self-evident. In this decadence the facility with which a photograph of ordinary merit may now be made has probably been an important factor. It has brought into the ranks a number of men who take the work of the past as the standard. The hope of attracting business has induced them to reduce prices, and a general impoverishment of everyday work has been the consequence. This tendency is not peculiar to photography. It is an inevitable outcome of the circumstances and may be seen in every branch. But although simplification of process leads to such results in one direction, it places in the hands of the skilful man fresh means, and the photographer should make use of every improvement, by raising the standard of his work, and adding to its attractiveness.

Photography and Poverty in France. The circumstances which led to the e[stablish]ment of the Photographers' Benevolen[t] Association are not without paralle[l] in France. Although the Association did good work [in] relieving numerous cases of genuine distress, so little in[terest] was taken in it by photographers themselves that it no l[onger] exists. According to an article by M. Léon Vidal i[n the] "Moniteur de la Photographie," this want of intere[st in] philanthropic work is still more pronounced in Fr[ance.] When the Union Photographique was formed for the [relief] of necessitous photographers it was thought the instit[ution] would be popular and do a large amount of good. The [sub]scription was fixed at five shillings per annum, and thous[ands] of circulars were issued inviting photographers to be[come] members. Nevertheless, there was not a single app[lica]tion for membership, and the funds had to be [sub]scribed voluntarily. M. Léon Vidal attributes the fa[ilure] of the effort to found the institution upon the basis of m[utual] help, to the absence of any need for a Benevolent Associa[tion.] Occasional cases of genuine distress have been relieved [but] M. Léon Vidal's inference seems to be justified, as there [has] not been a single application for assistance from any mem[ber] of the Association. Although photographers in France [may] not be opulent, they seem to be free from the pressu[re of] dire distress. Is this merely an instance of the greater t[hrift] of the French people, or may we infer that photogra[phy] is more remunerative in France than in this country, [or in] Germany?

* * *

The Photographic Apprentice. In Germany photography, as an occupat[ion,] is now counted among the handicrafts, [and] master and apprentice are placed under [the] jurisdiction of the Chamber of Handicrafts. The Nati[onal] Union of German Photographers have drafted an in[dus]ture of apprenticeship and submitted it to counsel for [ap]proval. As the clauses may be of interest to photograp[hers] in this country, we give the following translation, excep[ting] certain references to statutes.

APPRENTICESHIP AGREEMENT.

Between Mr. ..... as master and Mr. ..... [as] father (legal representative) of ....., under age.

§ 1. Mr. ..... takes the said ....., born ..... day of ..... 19... as an apprentice in his business to l[earn] the trade of a .....

§ 2. The apprenticeship shall be for ..... years, da[ting] from the ..... day of ..... 19... and terminating on [the] .....

§ 3. The apprentice shall serve four weeks as probatio[ner,] during which time either party to the agreement may ter[mi]nate it. If neither party withdraw during this period, it s[hall] be counted part of the apprenticeship, but in event of w[ith]drawal this agreement shall be treated as void. The prem[ium] shall be ....., to be paid on the ....., and there s[hall] be no claim to return of all or part, in the event of [the] agreement being cancelled.

§ 4. The master binds himself to educate the appren[tice] and make him a good workman by instruction given per[son]ally, or through a specially appointed foreman or assist[ant,] and by employing him in the work of his business. He s[hall] see that he is diligent and well-behaved, and shall do [all] in his power to keep him from vice and excess.

§ 5. The father (legal representative) of the appren[tice]

himself to enforce due diligence in learning the business g the apprenticeship. He shall see that the master's in- ts are served, that obedience and respect be observed rds the master, the foreman and men, and that customers be treated in a polite, obliging, and respectful manner. father also binds himself to make good any damage the entice may do through gross negligence

.The apprentice promises, in signing this agreement, that ill willingly and truly observe during the period of ap- ticeship all the duties and requirements which the ement imposes upon him, and particularly in relation struction and order in the workshops.

. The apprentice is subject to the parental discipline of aster, and, in the latter's absence, to that of his foreman an, whom he shall obey.

. The apprentice shall attend the continuation or tech- school. The master shall grant the requisite time for at- ance at the school, and shall see that the apprentice ds regularly and punctually.

. The apprentice shall receive during his apprentice-

) Tools from .....
) Board .....
) Lodging .....
) Bed .....
) Clothes .....
) Washing, &c. .....
) The master shall pay ..... for board.

0. If the apprentice fall ill for a period exceeding three ths,suffer from a deterrent illness, or be rendered unfit for , the master shall be released from this agreement with- iability to compensation.

1. Should the master die, or be compelled to release apprentice, this agreement shall terminate, upon four ks' written notice. If the apprentice desire to follow other calling, the father shall give four weeks' written e to terminate the agreement.

2. If the apprentice absent himself for any reason other provided by law, or if he desire to follow some other ng after expiration of the period of probation, the master be paid as damages, in the first year ....., second year ..., third year .....

3. If the apprentice commit an industrial offence, or ect to attend the continuation or technical school, he be liable to dismissal and shall pay damages to the mas- s providing in the preceding paragraph.

4. At the end of his apprenticeship, the apprentice shall nt himself for examination as a workman before the ex- ning committee of the Chamber of Handicrafts, and shall are a specimen of work which shall be examined by the mittee. The master shall supply the necessary material tools and grant time for preparation of the work, h shall become the property of the master unless other- stipulated.

the apprentice pass the examination, the Chamber of dicrafts shall pronounce him a competent workman, and hall receive a certificate to that effect signed by the mber and by the master.

the apprentice fail to pass the examination, he shall re- to his apprenticeship for a further term of three months shall then present himself again for examination. If gain fail, he shall only receive a certificate from the mas- ter setting forth the length of his apprenticeship, his knowledge and capacity and his conduct.

The expenses of the examination shall be defrayed by the father.

§ 15. The master and the apprentice, and likewise the father, agree to abide by any regulations issued by the Chamber of Handicrafts for control of apprenticeship, and also to submit to any decisions which may be given under their authority.

DAYLIGHT CARRIERS FOR DARK STUDIOS.

We have lately had the opportunity of examining samples of, and also of witnessing in action (though not in a studio) a new medium for what is virtually bringing daylight from a place where it is useless to another place where it is wanted. What this really means to a photographer is unfortunately only too well-known. There are hundreds of studios in the country with too much top-light caused by the presence of adjacent obstructing buildings, an effect of lighting fatal to the production of good results unless it be either reduced in amount or some extra plan be employed for causing light to be reflected or directed by some means from a quarter where tall buildings only exist at present. We have on many occasions dealt with this subject in the correspondence columns and otherwise; and the effect can be described very briefly. Standing in that part of a studio where a sitter would be placed, let the operator look at the glass of his roof and sidelights. Wherever he sees anything which is not sky or clouds, the part of the glass through which such object is seen might be entirely covered with opaque paint, so far as regards any diminution of light that would be produced on an object situated in the position of the operator's eyes. From the brick wall practically no light emanates, though light from the sky does actually fall upon the glass side or roof light. The great object is to make this window, in a sense, only luminous in daylight by diverting towards the sitter light that otherwise would fall on the studio floor near the wall or window. Many plans have been recommended, most of them being based upon giving a light-scattering surface to the glass. This is done mainly in two ways —first to paint over the glass some semi-transparent medium, such as starch, whiting, or special white paint, and, second, to suspend some translucent fabric such as nainsook, or, perhaps, hitherto best of all as recommended by Mr. Watmough Webster, the glazed-on-both-sides tracing-cloth, such as is used by engineers and architects. This not being prepared with an oil size, does not discolour with age, though in time a deposit from the atmosphere forms on the surface, and gives a yellowness that is not desirable. Still, for many months it can be used without being changed if it be wiped occasionally with a clean dry cloth. When too much yellowed by the deposit, it must be renewed by fresh material, as it cannot be washed like a piece of ordinary woven fabric.

So far as regards remedies available up to the present. With this new material, Luxfer Prism Glass, all this is changed. We are all familiar with rolled plate-glass with its fluted or its hammered surfaces, and sometimes the medium answers excellently; but what may be excellent in one studio may be worse than useless in another, owing to there being no definite calculable refraction by the flutings. With the Luxfer glass the altering of the direction of the light can be cal-

culated beforehand, and exactly the glass required can be supplied, as the Luxfer glass is not one but many. At this stage of our remarks we may describe the medium. Photographers, through their familiarity with the refraction of light through lenses, or its analogous passage through prisms, will more readily than an entire outsider appreciate the underlying principles governing the making of the various Luxfer articles. This glass is strong, more like thick plate-glass, comparatively smooth on one side, but impressed on its other side with parallel rows of deeply cut prisms entirely different from the ordinary fluted plate-glass. There are very many prismatic angles embraced by the various kinds of Luxfer glass, and they are so named and tabulated that by giving certain data to the managers of the syndicate which is working the patent, the particular glass can be supplied applicable to any particular circumstance and direction of light that is not otherwise utilisable. Thus a studio sidelight is useless through a tall building or brick wall opposite to it: if all the other parts of the glass are curtained over with opaque fabric, no light comes through this side window: it is useless. But let it be supplied with the new material we describe—suitably chosen for its prism angles—and in place of a dark window we have a blaze of light: we appear to be looking at the sky direct.

The effect is a revelation. There is, however, a qualification to be borne in mind, and, very wisely, the syndicate draw attention to it. Any one seeing a window supplied with Luxfer glass may rush to the conclusion that it is available under all circumstances and conditions. But there is a restriction. The prism glass does not create light, it merely carries it or brings it as its name implies; that is to say, if no light falls on the windows, a ton of prismatic glass would not bring it. But so long as the window receives light, which, instead of entering any distance into the room, merely illuminates the floor near the window, then will the Luxfer prism glass change its direction and send it to any part of the room, according to the particular pattern selected.

The price of the glass will naturally be asked, and we may say at the outset that the syndicate make two qualities, one very much dearer than the other. The best runs, without fitting or adapting, to eight shillings per superficial foot. Then there is a cheaper kind, which is cheap enough for any photographic purpose, fifteen pence per foot. The latter has not such a perfect surface, and there are fewer varieties in the prism angles; but it should suffice for all ordinary purposes.

We may point out that the glass is available for sending light in any direction, and light from any direction, not necessarily an overhead light. This is done by placing the axes of the prisms either vertical or horizontal, or at any angle.

There are very many ways in which the material can be used, and many useful data and calculations to facilitate its employment are to be found in the literature published by the syndicate. Meanwhile we content ourselves for the present with drawing attention to an invaluable aid to the illumination of dark studios.

THE ILLEGAL USE OF NEGATIVES.

It would seem from a letter which will be found in another column (see page 399) that photographers who do not make their own enlargements may be subjected to some annoyance, not only to themselves but to their customers; if the work is entrusted to unscrupulous, or careless, The facts of the case, as disclosed in the letter, are Some time back the writers sent a negative portrait of their sitters, a young lady, to have a carbon e ment made from it, which, of course, is an everyday action. In due course the enlargement was del Recently a friend of the young lady called on the graphers to inquire if they had a branch business in a town, which they had not. They were then told tha was an enlargement of the lady's portrait being exhib a shop window, or showcase, made from their ne Naturally they were very surprised, and greatly ar at this. Explanations from those who made the e ment were demanded and they were, in effect, that the parency from this negative had got mixed up with the and there was an expression of regret, &c.

Our correspondents ask if they have any remedy those who made the enlargement, and we are plea say they have: by injunction in the Court of Cha According to many rulings the negative is the prop the photographer, and in a case such as that detail transparency, as well as the enlarged negative, were t perty of the enlargers, but they have no right to use for any purpose of their own, such as selling copi specimens or the like. The case, as detailed by our spondents, is exactly on all fours with that of Poll The Photographic Company, tried in the Chancery D of the High Court of Justice, before Mr. Justice in 1888. In this case a lady's portrait, taken in the or course of business, was exhibited as a specimen in the window, and also copies of it mounted as Christmas were sold. An action, by way of injunction, was en and came on for hearing before Mr. Justice North i course. It was argued for the defendants that as the tive was their property, and although the copyright be the property of the sitter it was not registered, the they had the right to use it. The learned judge, in lengthy judgment, however, ruled otherwise, and gra a perpetual injunction and condemned the defendants in In delivering judgment, Mr. Justice North made the f ing remarks, which we think should be of value to thos use the negatives of customers for purposes of their ow here reproduce the judge's words. After referring to the for which the photographer is employed, he says: "F purpose the negative is taken by the photographer on and from this negative copies can be printed in much numbers than are generally required by the customer. customer who sits for the negative thus puts the po reproducing the object in the hands of the photogra and, in my opinion, the photographer who uses the ne to produce other copies for his own use, without auth is abusing the power confidentially placed in his merely for the purpose of supplying the customer; further, I hold that the bargain between the custome the photographer includes, by implication, an agre that the prints taken from the negative are to be a priated to the use of the customer only."

Now it will be seen that the ruling in this case appl every way to the matter detailed in the letter of our spondents, and that they should have no difficulty in ob ing redress. Their letter should serve as a caution to tographers to be careful as to whom they entrust clients' negatives, so that mistakes, such as the one al

o not occur, as they are not only annoying to the photo-her himself, but subject his clients to equal annoyance ; they, very naturally, surmise that it is he who has duplicates of their portraits for specimen purposes.

THE CHEMICAL PROCESSES OF OZOTYPE.

R Hauberrisser contributes to the current number of the otographische Rundschau" a note on this subject which confirms esults arrived at by Haddon.

anly, the discover of ozotype, assumes that light acts on the mium compound and sets free oxygen, which, in the form of e (hence the name), oxidises the manganous sulphate to a higher ganic compound, then the acid bath sets the oxygen free again, h combines with the gelatine and the hydroquinone, and makes former insoluble in hot water.

the chemical actions which take place are expressed in equations, get :—

1.

$$2K_2Cr_2O_7 + 3MnSO_4 = 3MnO_2 + Cr_2(SO_4)_3 + 2K_2CrO_4.$$

2.

$$K_2Cr_2O_7 + 9MnSO_4 = 3MnO_2 + 3Mn_2(SO_4)_3 + 4K_2CrO_4 + Cr_2O_3CrO_3.$$

e, however, potassium chromate combines with manganous hate to form manganese chromate, $MnCrO_4$, or basic manganese mate, $MnCrO_4MnO + 2H_2O$ (or $K_2CrO_4 2MnCrO_4 + 4H_2O$) can be ned, and, on the other hand, chromic sulphate forms, with assium chromate, chromate of chromic oxide, we obtain the ations :—

1A.

$$8K_2Cr_2O_7 + 20MnSO_4 = 15MnO_2 + 5MnCrO_4 + 8K_2SO_4 + Cr_2O_3 CrO_3 + 4Cr_2(SO_4)3.$$

2A.

$$4K_2Cr_2O_7 + 13MnSO_4 = 3MnO_2 + 3Mn_2(SO_4)_3 + Cr_2O_3CrO_3 + 4MnCrO_4 + 4K_2SO_4.$$

regards the formation of the image, the only products that need considered are the insoluble ones, or those that are nearly so, nely, manganese dioxide, manganese chromate, and chromate of omic oxide.

Absolutely pure potassium bichromate does not appear to enter o a reaction with manganese sulphate, as there is no dark colour med on mixing. For comparison, an equal quantity of the same ution of bichromate of potash was mixed with an equal quantity water instead of manganese sulphate. Both mixtures showed, en absolutely pure chemicals were used, the same shade of colour. According to the above two equations, in both cases, not only nganese dioxide but chromate of chromic oxide must be formed. uberrisser showed some time ago (" Photo. Rundschau," 1900, 152) that ozotype prints could be prepared without manganese sul-ate, if the paper was prepared with solution of gum and bichromate potash. The prints thus produced had rather less contrast than se produced with manganese sulphate and bichromate of potash, t were still distinct. The brown, so-called primary image, could ly consist in this case of chromate of chromic oxide, as the ducts formed by oxidation, the gum and the potassium chromate ultaneously formed, were found in the washing water.

It is now possible that chromate of chromic oxide and potassium romate are formed from the bichromate and paper or gelatine, d the chromate would produce with the manganese sulphate, man-nese chromate or basic chromate, so that the chemical action in otype may be expressed in the following equation :—

3.

$$3K_2Cr_2O_7 + \text{gelatine, paper, gum, sugar} + MnSO_4 = Cr_2O_3CrO_3 + \text{oxidised gelatine, \&c.} + K_2SO_4 + MnCrO_4.$$

ccording to this view manganese dioxide is not formed.

Manly himself assumes that the brown image would be formed manganese dioxide or even higher oxidation products of manganese. The latter is highly improbable; manganic and per-manganic acid are very unstable bodies, whilst pictures can be obtained from the brown primary image even after nine months.

Manly's other assumption also, that the image consisted only of manganese dioxide is incorrect, as will be seen from the following experiment: on a sheet of single transfer paper some letters were written with a warm five per cent. solution of potassium permanganate to which a few drops of ammonia had been added; after a few seconds the red solution of potassium permanganate became brown through the formation of manganese dioxide. After drying the paper was washed with water and pressed into contact with pigmented tissue which had been bathed for a minute in acetic hydroquinone solution. On development only traces of an image were to be seen, which completely disappeared on further development with warm water.

A further disproof of Manly's assumption was given by an analysis of exposed paper; chemically pure filtering paper was prepared with manganese sulphate, and bichromate of potash, exposed for several days and then washed till the cold washing water was no longer coloured. The paper was then treated with dilute nitric acid and by analysis chromic acid, chromium oxide, and manganese were found.

As Manly's assumption, that the brown image consisted of manganese dioxide, was proved unsatisfactory, it was an open question whether the formation of the primary image was formed according to equation 1, 2A, or 3. The latter differs from the others in the absence of manganese dioxide. As a chemical analysis cannot be made here, differences of behaviour must be looked at. In behaviour towards an acetic hydroquinone solution, paper prepared with manganese dioxide, as already described, shows no distinct difference to the primary ozotype image; both images were dissolved even if the former more slowly. Quite different was the behaviour to dilute, one per cent., acetic acid: here the former image, consisting of manganese dioxide, would not dissolve; the other, on the other hand, very easily.

From this simple experiment it is plainly shown that in the primary image no manganese dioxide is present, and that therefore the chemical processes in ozotype must take place according to equation 3.

That manganese dioxide is not dissolved by dilute acetic acid, but is slightly so by the acetic hydroquinone solution, is due to the fact that manganese dioxide, which will not itself dissolve, acts as an oxidiser on organic substances in the presence of dilute acids, as it dissolves as manganous salts. The previously mentioned experiment, that manganese paper gives a trace of an image by treatment with pigmented tissue and acetic hydroquinone solution, is also explained by this.

The explanation of the formation of the so-called secondary image is considerably simpler. There are obviously two questions to answer :—

(1) What is formed by the action of manganese chromate and chromic oxide on hydroquinone in the presence of dilute acetic acid ?

(2) How do these substances act on gelatine ?

The answer to the first question is easy: the hydroquinone is oxidised to quinone, and in small quantities to complex dark-coloured compounds, while the chromic acid is thus reduced to chromic oxyhydrate, which immediately dissolves in the acetic acid and forms chromic acetate; the manganese is converted into manganic acetate.

To answer the second question, diluted solutions of quinone, chromic acetate, and manganic acetate were prepared, and the halves of strips of pigmented tissue dipped in these solutions for some minutes. After drying, the strips were treated with hot water, and it was found that the halves treated with the solutions had become insoluble.

From these experiments it is clearly to be seen that the chromate of chromic oxide and manganese chromate, of which the primary image consists, oxidise the hydroquinone: the oxidation product of hydro-quinone, as well as the manganic acetate simultaneously formed, and the chromic acetate render the gelatine insoluble in hot water, and thus produce the pigment image.

E. J. Wall.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

As we announced last week, the first General Meeting of the Professional Photographers' Association will be held on Tuesday evening, July 2, at 8 o'clock at the rooms of the Royal Photographic Society, 66, Russell-square, W.C. The kindly interest taken in the new Association by the Council of the leading photographic society of the world is evidenced by the fact that the use of the rooms for the purpose of the meeting was granted with the utmost spontaneity and unanimity. The thanks of the Association are certainly due to the R.P.S. Council and the officers of the Society for their action in this matter. Every paid-up member of the Professional Photographers' Association will receive an official notice of the meeting on July 2. The business, if of a formal nature, will nevertheless be of the highest importance, as we have already pointed out. Besides the adoption of the rules, the election of the executive for the year 1901–1902 is a matter that must be dealt with by the meeting. To quote from Rule 10:—"The Honorary Officers of the Association, constituting the Committee, shall be a President, Vice-President, Treasurer, Secretary, and twenty ordinary members of the Committee, not more than ten of whom shall be London members. They shall have power to appoint an Assistant Secretary, who may be paid." The officers and Committee must necessarily be chosen by ballot at the July meeting, which practically starts the official existence of the Association. As showing the earnest desire of leading London photographers to forward the work of the Association and promote its success, we are happy to announce that Mr. Alfred Ellis, of 51, Baker-street, W., is willing to continue the office of Honorary Secretary, and that Mr. William Grove, of 63A, Baker-street, W., has consented to retain the Honorary Treasurership. Naturally, these appointments are subject to election on July 2.

The Provisional Committee has drawn up a list of town and country members of the Permanent Committee to be submitted for election to the meeting, which will also be called upon to appoint two Auditors to examine the accounts, it being thought desirable to present a balance-sheet showing receipts and expenditure to date.

Third List of Members of the Association.

The third list of Members of the Association received from the Honorary Secretary is appended:—

Baker, Harold, Biograph Studio, Regent-street, W.
Blampey & Son, East-street, Ashburton, South Devon.
Bell, Richard, Exchange-arcade, Hawick, N.B.
Castle, Samuel James, 38, Canterbury-road, Whitstable, Kent.
Coles, William, Photographer, 60, Queen's-road, Watford.
Cuzner, Everard, Vandyck Studio, Oxford-street, Reading.
Cherry, Edward (Cherry & Co.), London-road, and Chequer-street, St. Albans.
Dawkes & Partridge, 29, High-street, Wells, Somerset.
Davis, Ernest T. (Elite Portrait Co.), 267, High Holborn, W.C.
Dickinson, James, Photographer, Neville-street, and Pink-lane, Newcastle-on-Tyne.
Gamlen, Thomas G., The Studio, 47, Church-street, West Hartlepool.
Hall, Charles P., Hall's Photographic Studio, 17, Argyle-street, Glasgow.
Hole, Charlotte (Herbert H. Hole), The Studios, Williton and Minehead, Somerset.
Harris, S. M. (as Saville), 281, Lord-street, Southport.
Innes, Thomas Everitt, 108, Wellington-road, Heaton Chapel, near Manchester.
Jacolette, Martin, 42, Harrington-road, South Kensington, S.W.
Kingham, H. J., Victoria Studio, Cauldwell-street, Bedford.
Leigh, Thomas, Photographic Artist, Aubrey House, Abergele, North Wales.
MacMahon, Frank Charles, Photographic Art Studio, 23 and 25, Academy-street, Inverness, N.B.
McLaren, John, Greendykes-road, Broxburn, N.B.
McIlwrick, William J., 98, High-street, Paisley.
Medrington, Arthur Stanhope, (Medringtons Limited), 29, Bold-street, Liverpool.
Phillips, Harry F., 19, St. Edward-street, Leek, Staffs.
Pumelle, Henry, Headingley, Leeds.
Pym, Douglas, F.R.P.S., Belle Vue Studio, Streatham.
Ramsden, Joseph, 63, Granby-street, Leicester.
Sawyer, Lyddell, 230, Regent-street, W.
Watson, Christopher, 4, Kirkgate, Ripon, Yorkshire.
Wilkinson, Edgar (Wilkinson & Co.), 27, 29, Rampant Horse-stree Norwich.
Weston, Arthur, Mansion House Studio, 16 and 17, Poultr Cheapside, E.C.
Weston, Sidney Lambert (Lambert Weston & Son), 23, Sandgat road, Folkestone, and 18, Cambridge-road, Dover.
Whaley, Frederick, Regent House, Doncaster, and Esplanad Scarborough.

In round numbers the Association now consists of three hundre "paid-up" members—an excellent beginning, and a most en couraging outcome of two months' work. The Association is alread one of the largest photographic societies in the country; but a present it is only in its infancy. The scope for its numerica growth is clearly very great. On many occasions we have estimate the number of professional photographers in this country to be fiv thousand. Of these not more than four thousand figure in th directory. We learn, however, from well-informed sources that w have under, rather than over, estimated the number, and that, al told, there are not less than six thousand persons in Great Britai and Ireland separately engaged in business as professional photo graphers. We are not so sanguine as to suppose that the whole o this enormous number can be induced to become members of the Association—the majority, alas! take little interest in the welfare o their profession or the progress of photography, but we have a firm belief that in due time a membership roll of between one and two thousand will be reached. Plans are under consideration whereby, after the first meeting (on July 2), a systematic canvass of the whole of the profession will be set in force so as to bring about the result we have in view. Meanwhile let us again congratulate the members of the Association on the good start that has been made. A study of the list will show that the foremost photographers in the country are in sympathy with the Association's objects. Quoting from the circular that has already been issued, these objects are:—

"1. To watch Parliamentary and public action affecting the interests of professional photographers.

"2. To consider the Factory Act in its influence on photographic labour.

"3. To secure uniform and equitable terms of fire insurance.

"4. To maintain the photographer's right to the negative.

"5. To regulate the apprenticeship system.

"6. To suppress price-cutting.

"7. To protect photographers in the sale of poisons.

"8. To regulate manufacturers' discounts, &c.

"Such, in addition to those stated in the rules, are only a few of the many objects that may be dealt with by the Professional Photographers' Association.

"Can it be denied," proceeds the appeal, "that such an association, long desired and now formed, should claim as a right the active support of every one interested in the welfare of his profession and desirous of raising its status? The answer to this appeal will have a vast influence on the future of British Professional Photography. If, as the Committee confidently hope, the responses are numbered by thousands, a new power in the photographic world will exist, to be wielded on behalf of those who constitute the very life's blood of photography: the professional men and women. The Committee, therefore, most earnestly appeal to their brethren to accept this opportunity of making the Association numerically strong—for its strength will lie in numbers as well as in the justice of the cause it is created to champion. The subscription has been fixed at the low sum of five shillings so as to place membership within the reach of all; but this does not preclude donations to the funds."

Last week we printed the form of application for membership of the Association; and this week we also print it, so that our readers

y have the opportunity of filling it up and returning it with the scription of five shillings to the Honorary Secretary.

To the Honorary Secretary,
Professional Photographers' Association,
51, *Baker-street, London, W.*

Please add my name to the list of members of the Professional otographers' Association. I enclose the amount of my first year's scription, 5*s*.

*Signature*_____
_____1901.

Please fill in the following particulars for Members' List:—

ll Christian and Surname _____
ll title of Firm or Company _____
ll Address_____

THE LATE GEORGE SHADBOLT.

HE recent death, at a very advanced age, of Mr. George Shadbolt, moves from the scene one of the ablest and most scholarly editors hich this JOURNAL has had during its forty-seven years' existence. r. Shadbolt occupied the Chair for about seven years between 1857 d 1864; and it is thirty-seven years almost to the day since the owth of his private business necessitated his retirement from photo-aphy and its journalism. With Mr. Shadbolt's disappearance, THE RITISH JOURNAL OF PHOTOGRAPHY, which had hitherto been sued fortnightly and consisted of eighteen pages, became a twelve-ge weekly, and the publishing and editorial offices were removed om Liverpool to London. It was also at this time that the late Mr. Traill Taylor began an editorial association with the JOURNAL hich, ceasing in 1879, was renewed in 1885, and continued until his ath in 1895.

Mr. Shadbolt, who was one of the founders of the Photographic ociety of London, now the Royal, devoted much attention to the ptics of photographic lenses and to photo-micrography; and upon ose themes his contributions to the JOURNAL during his editorship ere valuable and frequent. He is also said to have been the first to ke a micro-photograph, and, so far back as 1858, suggested the racticability of a triple lens "consisting of single convex lenses at ch end of a short tube corrected by a concave of flint glass in a entral diaphragm." He was a Vice-President of the North London hotographic Association, before which body we find him reading a aper, in May, 1863, on "Open-air Portraiture."

The pages of the JOURNAL for 1864 testify to the great esteem in hich Mr. Shadbolt was held by those with whom he was associated, nd some months after his retirement he was the recipient of an legant silver épergne in recognition of his services to photography. he following gentlemen formed the deputation from the Testimonial ommittee at the presentation, which took place in July, 1865: Messrs. Shave, E. W. Foxlee, Melhuish, G. Wharton Simpson, J. raill Taylor, Hill, H. P. Robinson, and Barnett. An editorial note n the JOURNAL of July 7, 1865, expressed admiration of Mr. hadbolt's varied acquirements as a scholar and a man of science; orrow that he should have felt compelled to resign a position, the luties of which he filled with dignity and efficiency, and regret at is withdrawal from the field of photographic research, while yet in he full maturity of his mental powers. There are photographers till living who speak in terms of the highest appreciation of the late Mr. Shadbolt's great ability as an editor and a student of photo-graphic science. The deceased gentleman's son, Mr. C. V. Shadbolt, t may be remembered, was keenly interested in balloon photography, n which he did good work. It was due to a balloon accident that he owed the tragic termination of a life that promised to be of the greatest usefulness.

Happily the lapse of more than a generation has not removed the feelings of esteem in which our gifted predecessor was held. He was the only one of the long line of able editors of the JOURNAL whom we never met—with James Alexander Forrest, James Martin, Samuel Highley, George Dawson, W. B. Bolton, J. Traill Taylor, it has been our privilege to talk of the early days of photography—nevertheless, his printed record and reputation still remain for us to respect and profit by.

PHOTOGRAPHY WITH THE CYCLE.

As this is the season when the combination of photography with cycling is much in evidence, we may be allowed to make a few remarks upon the subject, viewed, not only from the photographic point, but also from that of the cyclist. A recent Whitsuntide run of over one hundred miles was no new experience to us; but, inasmuch as the first five-and-twenty were covered in a heavy downpour of rain, we were made uncomfortably aware of certain little defects in our arrangements, as hitherto carried out. We have been caught in the rain many times, but never to the extent of our experience of May, 1901. If, strictly for the time, our enthusiasm was somewhat damped, who can wonder, for what sort of photography, given a clearing of the horizon and a few gleams of sunshine, is to be done when one's feet are swimming in one's shoes? Riding on, and gradually but surely getting wetter, we cogitated over various aspects of the situation, as, for instance, the desirability of top-boots in place of the ordinary cycle shoe, the discomfort of a macintosh cape, the advantage of a dropped frame over the horizontal, whereby one might wear a long waterproof reaching to the feet; the fickleness of the weather; our general ill-luck on this and similar excursions, and various other matters which come to mind under similar circumstances; at the same time we kept an interested eye upon our camera case, and watched the rain gradually insinuating its way into its interior.

The modern bicycle, with its shorter frame and narrow tread, and its equipment of brakes, is not so well adapted for camera and parcel-carrying as was formerly the case; we very soon discover this when we start to load our machine with the requisite paraphernalia. The best position in which to carry the camera is, if the distance to be covered be short, in the hand of the rider, or suspended over the shoulder; if in the hand, hanging lightly, we practically eliminate all danger from vibration, but, of course, on a long journey this method—even if the weight be borne from the wrist by means of a soft leather strap—becomes extremely irksome; the weight on the shoulders also gets to be very annoying after a few hours, and if rain comes on, necessitating the use of the cape, the camera is at once subjected to a steam bath, for after an hour or two the cape is almost as wet inside as out. This "steaming" is not beneficial to the apparatus nor to its contents; the position under the top bar is now out of the question owing to the closeness of tread in the up-to-date cycle. Hitherto we have favoured the handle-bar, fitted with a good spring carrier, as the most convenient place for the apparatus, and, where the case can be fixed so that there is no interference with the lamp and steering arrangements, we still prefer this position. A certain amount of weight is permissible over the front wheel, not so much over the front wheel as in front of the rider—that is to say avoiding a carrier which projects too much in the direction of the lamp, and drawing a line from the rider's head to the front and back wheel-rims respectively we endeavour to keep well within these lines: a certain amount of weight is permissible in front, tending, as we think, to even and steady steering—a factor in the safeguarding against side slip; in any event should this accident happen, we think still that the front wheel position would be the safest place for the apparatus. Our rule has been to carry the apparatus in front, on the handle-bar, and such change of linen and so on as may be required upon a second carrier over the back wheel, close under the saddle. The weight of the baggage is thus distributed to the best advantage, the greater weight at the back and the lesser in front.

The camera case should be carefully chosen. We do not require a heavy article, but it should be waterproof, and, from such an ordeal as we experienced recently, few camera coverings on the market would emerge satisfactorily; the average commercial case will stand the average shower, but a heavy downpour, the semi-tropical variety, with some changeable wind, and the upward splash of mud and water finds out its weak points. Our next case will be of different pattern, i.e., of a figure much affected by draper's travellers, a case in which to pack the apparatus, and a loose cover which goes down over the whole, the fastening being by straps. Such cases for cyclo-photographers would not be heavier than the ordinary article, and would certainly, if covered with leather, better withstand a heavy rain.

B

With regard to vibration, there does not appear to be a prospect of much improvement so far as appertains to the cycle. All we have to look for is a better surface to travel on, and a carrier which shall be sufficiently springy, even upon such roads as are to be met with in the Fen country; thence, nearly to the metropolis, the "bumping" is at times very real. The man in Devonshire or Northumberland may have reasonable cause for grumbling in the matter of roads, but he may congratulate himself on the possession of finer and more varied scenery than is to be met with in the flat country. Is there less vibration over the back wheel than over the front is a question we think not to be decided as applying to all machines alike, because, if so, one would naturally select the position of less vibration for the camera, if the latter is to be attached without the intervention of springs; if we prefer the position in front of the rider, it is on the score of general convenience, the apparatus is always in sight, is attached to a carrier (such as the Frena) which absorbs the greater part of the vibration, and is, in the event of accidents—this is our experience—in the position of least danger.

BANBURY, COMPTON WYNYATES, AND BROUGHTON CASTLE OR WROXTON.

[Reprinted from the "Handbook to the Photographic Convention of the United Kingdom."]

Banbury is a market-town of considerable antiquity. From the Norman Conquest to the Reformation it was a possession of the See of Lincoln, and in 1125 Bishop Alexander built a castle here, which had a not uneventful history, withstanding two long sieges by the Parliamentarian soldiers during the Civil War. It was completely demolished at the close of the war. The same bishop also built a church here which, with its subsequent additions, formed a splendid specimen of Gothic architecture. It was, however, ruthlessly destroyed in 1790, on the ground of excessive dilapidations, and the present building in a classic style erected. The interior of the present church was extensively altered and decorated from 1873 to 1876. The original Cross, referred to in the well-known rhyme, was demolished by the Puritans in 1602, but the present Gothic structure was erected as a memorial to it in 1858, and also as a commemoration of the marriage of the Princess Royal of England with the Crown Prince of Prussia. The original Cross stood within a few yards of the present structure. The oldest features of the town are the ancient houses which are to be found in various parts, with picturesque gables, barge-boards and pargetted fronts, which are good specimens of the domestic architecture of the reigns of Elizabeth and James I. Those most worthy of notice are the Unicorn Inn in the Market-place, which has a handsome pair of ancient gates, and those in the High-street (occupied by Mr. Betts and Messrs. Neale and Perkins), the date of which is possibly 1600. The house occupied by Mr. Bartlett, chemist, in the Market-place, is worthy of notice as having a double-dormer, of which, we believe, only one other example exists in the country. But the piece of antiquity most deserving of a visit is the Reindeer Inn in Parson's-street. The gates bear the date 1570. A very fine oak-panelled room having a separate entrance from the yard, from which it is lighted by a fine mullioned window, should certainly be seen, as it has been declared on good authority to be one of the finest specimens of a Jacobean room to be found. Its fine plastered ceiling and panelling are decorated in the Cinquecento style of Italy. Tradition states that Cromwell used the room during the Civil War, and although no actual evidence exists to support it, there is every reason to believe that the statement is founded upon fact. It is called the "Globe Room"—why, has not yet been explained. The front part of the vicarage house in the Horse Fair is a pleasing specimen of a stone domestic building of the 16th or early 17th century. The other public buildings and religious edifices are modern.

Compton Wynyates lies nine miles west of Banbury, and is a romantically situated mansion of the date of 1510—an excellent example of the brick buildings of that period. It was built by Sir William Compton, a favourite of Henry VIII. In the Civil War his descendants were leaders in the Royalist army. A noticeable feature of the exteriors are the twisted chimneys, which were brought entire, it is said, from Fulbrook, a neighbouring park, from which, it is said, Shakespeare stole the deer. In the interior the large hall is the most attractive feature. It extends to the full height of the house, and has a fine open timber roof and a picturesque half-timbered minstrel gallery. A handsome oak screen divides it from the buttery. Among the bed-chambers are those used by Henry VIII. and Charles I. Next to the former is a chamber communicating with a secret hiding-place, of which the house has several. In a corner of the mansion called the Great Tower there is an apartment called the "Council Chamber," having panelling of split oak from which more than one staircase communicates with the ground and with the "Priest's Room" above. This is a chapel in the roof, no doubt used by the recusants in the 16th and 17th centuries. On one of the window-sil in this room is an elm board bearing five roughly-cut crosses, sa to be consecration crosses, and marking the board as having been us as an altar for the rites of the Roman Church. It is claimed as t only instance of a wooden altar known in this country. "The Ba racks" are an apartment (now divided into separate rooms) of abo 130 feet over the drawing rooms, and having a secret staircase co municating with below. In the Chapel (now used as a lumber roo on the ground floor) is a curious carved screen, worthy of notice, a apparently older than the house. The neighbouring church was bui in 1663. The house, which stands in a delightfully retired situatio amidst wooded heights, is still used as a residence by the Marqu of Northampton, in whose family the property has been since t time of Edward I.

Two-and-a-half miles out of Banbury, on the way to Compton Wy yates, stands Broughton Castle, the family home of the Saye an Sele family, but now occupied by Lord Algernon Gordon Lenno The older portions of the eastern end and some of the gateway an walls date from the 14th century, but the main portions (all of ston are Tudor. The Great Hall is an interesting apartment, and ha (as have other of the rooms) a finely decorated plaster ceiling. Th drawing room has a curious internal porch of carved oak, adde after the Restoration and copied, it is said, from one in the Counc Chamber at Venice. In "Queen Anne of Denmark's Room" there i a curious opening looking into the chapel. (There is a somewha similar arrangement at Compton Wynyates). The chapel is of th Decorated period, and a beautifully vaulted stone passage runs al round this portion of the building. William, Lord Saye and Sele was one of the foremost opponents of King Charles in his struggl with the Parliament, and secret conferences were held by the leader of the Parliamentarians at Broughton, at which the details of th coming appeal to force were discussed and arranged. These confer ences were held in a small apartment called the Council Chamber which is still shown in the roof, and which, having three outer wall and the fourth side only communicating with the house by a flight o steps, is admirably situated for such a purpose. Before coming (by marriage in the reign of Henry VI.) to the Saye and Sele family, th mansion was in the possession of the Wykeham family, including the celebrated bishop-builder, William of Wykeham. The Castle is most picturesquely situated inside a moat. Close by is the church, an edifice of the Decorated period, having some interesting family monuments.

By returning from Compton Wynyates by another road Wroxton Abbey may be visited. This is the residence of Lord North, and a particularly fine building in the Tudor style, standing in beautiful and spacious grounds, and deriving its name from having been built in 1618 (some parts are of later addition, but in the same style) on the site of an Augustinian Priory. Here, again, the hall is an attractive feature, and contains some beautiful carving brought from Flanders. An interesting suite of tapestried apartments are well worth a visit, and the family and other portraits are especially interesting. The house also contains many objects of interest.

William Potts.

PORTRAITURE: SOME POINTS OF THEORY AND PRACTICE.

In the course of a recent address at the Camera Club, Mr. Harold Baker observed: In photographing full-length figures, you find that the swing back of the camera, which many people disregard al together in portraiture, is very useful. One does not want the whol of a figure perfectly sharp as a rule. It is the eyes and face tha are supposed to be the points to focus upon. Slight diffusion in th other parts of the figure, if not too palpable and obtrusive, is to b desired; but unless you use a swing back for some classes of full-length poses, too much diffusion, or want of sharpness, is the result, and we ought to be careful to avoid attracting attention by the degree of diffusion. The position of the camera, as to height, is also very important. Portrait painters always pose their sitters on a "throne," and look up at them. In photography this is not advisable. You exaggerate the width of the nostrils, particularly in full-face portraits, and the line of the jaw is also strongly exaggerated. There is a photographer in London, whom I will not name, but you can always tell his photographs, because of the prominent line of the jaw, due entirely to the camera being too low. In dealing with three-quarter length figures, one of the chief difficulties is that of satisfactorily arranging the hands, and it is made worse for us by the fact that for generations portrait painters have painted their pictures with impossible hands. Reynolds—great master that he was—was a sinner in this respect. It was his habit to paint the faces of his sitters actually from the sitters, but the arms and hands from Kitty Fisher or Nelly O'Brien, or any other whose arms and hands were of an ideal nature. In photographing we get perhaps a little exaggeration, and anything that may be displeasing about the hands and arms is at once put down to the camera's reputation for exaggerating such details, whereas, as a matter of fact, it is more correct to say that the photograph has rendered the sitter with far more truth than the average painting.

often it is possible to secure excellent results in ordinary rooms, as plates are now so rapid, the percentage of successes is far er than it was a few years ago, when such things were almost ely out of the question. A sitter in accustomed surroundings is rally more "at home," and consequently one may frequently get ry natural and real portrait. Instead of putting the sitter close ie window, so as to get a strong light on one side of the face and adow on the other, which is relieved by a reflector that often only es to destroy the modelling of the face, put the camera in the low itself and the sitter back, not necessarily fronting the light, so if you wish. Portraits produced in this way are sometimes rior to those produced in a studio. Above all, do not worry sitter. Try everything of an experimental nature on your tant, and you will get your poses ten thousand times better. ke, speaking of posing, says that the best poses a photographer are those which he observes and not those which he creates, and I e agree with him. As I have already stated, many of the most essful portraits now done are those taken in ordinary rooms. The teur portrait photographer will probably sigh for a lens specially ed for portraiture, but it is not at all necessary. Some of the best k is done with the ordinary rectilinear lenses, particularly with e working at large apertures. These lenses are probably much er than the old portrait lens, which was designed solely for rapidity. ood rectilinear, or one of the Goerz type of lens, will do quite as for portraits, but it should be of long focus. For a half-plate rait you want a lens of not shorter focus than ten inches or twelve es, and this is none too long. Distortion and unnatural effects are usual result of the use of short focus lenses for portraiture. They therefore, to be avoided. If you can get a sitter capable of keep- still for a prolonged period, it is as well to give a long exposure, by stopping down the lens, but by subduing the light. Portraits have had up to a minute's exposure are always better than in- taneous ones. There is a change of expression without perceptible ement of the face, and the result is consequently far more life- than that of the usual exposure of three or four seconds, or less. ainted portrait is for this reason so much more like a sitter than hotograph. You get a series of portraits blended in one; but he instantaneous photograph there is only one unnatural, uneasy se that is not nearly as good as the picture produced by an ex- led exposure. If a long exposure cannot be given, a rapid one is er than one of 10 seconds or so. As regards lenses, the Bergheim- lmeyer lens is very useful, but not to the professional man—it may for the amateur portrait photographer. The plates used should not those specially suitable for outdoor work or architecture. You not want the same kind of negative, but one much less dense—no e glass and no intense high lights. For development I have a pre- nce for some of the newer developers to pyro-ammonia, because y give a quicker printing negative, which is of much importance to professional photographer, and also a softer negative with more ail in the shadows. They give, as a rule, less contrast—a quality that eminently suitable for our work. The negative must have no que parts, and no clear glass shadows. Opinions vary, I know, siderably. Scientific and technical men, of course, insist upon ing clear, bright negatives; but my own experience tells me that negative which is going to give you a print which you will like t is what the technical men call a bad one. The electric light is te capable of being arranged to give beautifully soft results. Some ple say that many special effects of lighting are got by retouching, , as a matter of fact, the amount of modification of lighting in face by retouching is infinitesimal.

ON THE CHOICE OF TONING BATHS FOR GELATINO-CHLORIDE PRINTS.

I.

the various factors that have to be taken into consideration in the rking of the gelatino-chloride printing-out process, the matter of choice of a suitable toning formula is beyond doubt the most im- rtant. That this choice is, as a rule, one of considerable difficulty make, will be, it may be opined, the generally expressed opinion those who have had occasion to experiment with the process in estion; and they will also bear testimony to the fact evinced, as it by the quality of the work produced—that something besides the ercise of the utmost care in the selection of a suitable formula is uired to ensure inerrancy in making that choice. These circum- nces are to be attributed to the comparative novelty of gelatino- oride of silver as a printing vehicle. In regard to it, there is essarily lacking that abundance of data, accumulated in the course years, which is available in the case of the older silver-printing ocess, and which is so successfully utilised by those printers who still conservative enough to adhere to methods which are becom- obsolete. In the transitional state of things that prevails at the esent time a knowledge of the conditions favourable to success in rking the old process is, so far as the new is concerned, an ac- quisition of questionable utility, being indeed rather of the nature of a hindrance than that of a help. It is an obstacle to real progress in this way, that all too frequently it tempts the photographer to mis- use the data that he finds ready to his hand. That data has been amassed by specialists who have made the albumen-silver printing pro- cess the one object of their study, and who have accumulated the body of facts solely for the guidance of those engaged in working that particular process. Amongst the younger generation of photographers, however, this seems to be overlooked. At all events, the special object which those investigators had in view in making their experiments is no longer regarded as the legitimate and only possible application to which the information so acquired is capable of being devoted. It by no means follows that the conditions that have been formulated for the benefit of those working the albumen-silver process will be of equal service to the modern photographer who employs the gelatino- chloride process; yet, notwithstanding, it is too often unthinkingly taken for granted at the present day that such is the case, and that the difficulties of manipulation appertaining to the new process can be overcome simply by treatment based on a study of what has been written concerning the old. That, as a matter of fact, they are not overcome with any great measure of success is, I think, pretty gener- ally admitted, although unfortunately the true reason for this is but rarely apprehended, failure being usually attributed to causes which have exercised little or no influence in producing the results.

In the meantime, at least, it seems inevitable that this should be so. There is as yet a lack of that adequate data which is required as a substitute for the misunderstood and misused rules of our former teachers. Beyond doubt, considerable progress has already been made in the direction of collecting fresh material, but the subsequent task of classification and codification is likely to prove a formidable one, and years will probably be required to accomplish the work. In- dividual effort at the present stage will find its most profitable outlet in experimental work, undertaken with the object of contributing new facts to the mass of knowledge which is being gathered together. In this connexion, the choice of suitable formulæ for the preparation of the toning bath is a matter of the first importance. There is here great scope for scientifically conducted investigation, both as to the part played in the toning process by the special salts employed, and also as to the influence exerted by such factors as strength of solution, temperature, relative proportions of salt and gold, &c.

In this and the following article I propose to give my experiences of several novel forms of toning bath which I have recently tried, one or two at least of which seem fitted to meet most of the requirements which we are entitled to demand of an ideal bath for the class of work under consideration. As a brief definition of these requirements ap- pears necessary in order that the experiments which I am about to describe may be of any service, a few words in regard to them will here be said by way of preface to the subject-matter of these papers.

In the first place, it is essential that the bath employed should be easy to work and expeditious in operation. The details of manipula- tion should be so simple as not to demand any unusual expenditure of time and trouble on the part of the operator. The action should be rapid, yet perfectly under control at all stages, and the gold should be readily and continuously deposited on the surface of the image.

Next, it is, of course, very desirable that the quality of the tone produced shall be such as will conform to our æsthetic requirements as regards colour. Experience tends to show that the formulæ usually recommended for toning purposes do not as a rule give sufficient range of colour. There is an absence of that variety which characterises the prints obtained, say, on albumenised paper toned by means of the acetate bath, and this even although the colour actually produced is in general agreeable enough.

Thirdly, care must be taken that the chemical action of the bath employed is not such as will impair the vigour and brilliancy of the image by degrading the original well-balanced contrasts of light and shade, and substituting for them a range of gradation weak and artificial.

Lastly—and this is of the utmost importance—the formula selected should be such as will permit of the toning operations being carried out without risk of detriment to the appearance of the prints, either through the formation of stains or through the obtrusive character of that class of phenomenon commonly termed double toning.

I shall now proceed with my account of the several forms of toning bath which were employed in the present series of experiments.

No. 1. The Picrate Bath.—The first salt experimented with was sodium picrate. A toning bath was made up according to the follow- ing formula:—

Crystallised sodium picrate	36 grains.
Chloride of gold	1 grain.
Water	12 fluid ounces.

Before toning, the prints were well washed in a large vessel of water for ten minutes, being kept in constant motion during the time of immersion. They were then withdrawn, and each in turn was held under a stream of running water for two minutes, then allowed to drain, and transferred to the toning bath. An immersion of from

four to five minutes in this served to produce a vigorous sepia-brown print. It was also noticed that prints of a cold violet-black tone, and of a grey somewhat resembling platinotype could be obtained by prolonging the toning process, an immersion of from twelve to fifteen minutes being usually found sufficient to produce the desired effect. The toned prints were rinsed well in water, and then transferred without further delay to the fixing bath, the formula of which, both for this and the subsequent experiments with other toning baths, is given below:—

Sodium hyposulphite	2 ounces.
Water	14 fluid ounces.

On immersing the prints in this solution it was noticed that the hyposulphite produced practically no alteration in the appearance of the image as regards tone. After fixing, a change was, however, noticeable, but one so slight as to be apparent only when the prints were compared with a toned and unfixed proof. The washing process was carried out in the customary way, and it was found that such traces of the yellow colour due to the dyeing properties of the picrate as had resisted the action of the intermediate washing after toning were now effectually removed, and the whites of the image were left unblemished.

The finished prints, though quite free from stains and other defects attributable to irregular toning, were, as a whole, somewhat flat and dull in appearance, notwithstanding their agreeable colour. This defect was not so marked in those of a sepia-brown colour, but in the case of the purple and purple-grey prints the effect was far from pleasing. Upon this ground, therefore, the picrate formula, notwithstanding that its action is more regular and better under control than that of many of the toning formulæ commonly made use of, will fail to recommend itself to many. It may, perhaps, be found of service on certain occasions, as, for instance, when it is desired to effect an improvement in chalky prints from a very hard negative, when, other means failing, it may be legitimately employed to diminish the excessive contrasts of the subject.

No. 2. The Succinate Bath.—The second salt experimented with was sodium succinate. A toning bath of the following formula was prepared:—

Sodium succinate	36 grains.
Chloride of gold	0.75 grain.
Water	9 fluid ounces.

The prints on their removal from the printing-frame were washed for ten minutes, as before described, well rinsed in running water, and immersed in the succinate solution. The action of the bath was somewhat slow. Fully eight minutes' toning was required to produce a satisfactory result, and in the majority of cases it was found beneficial to increase this interval to ten or even twelve minutes. The quality of the prints so produced, however, as regards tone and other essentials was all that could be desired.

The colour of the fully toned succinate prints was a rich purple-red, whilst agreeable proofs in sienna-brown were also obtained, the latter by suspending the toning operations at a somewhat early stage. After washing, the prints were fixed for twenty minutes in a hyposulphite solution of the strength already given. When at first immersed in this bath the proofs were found to suffer considerable change in appearance, a marked diminution in the intensity of the image being observed, which was moreover accompanied by a decided alteration in colour. After about fifteen minutes had elapsed, however, the prints on re-examination were found to have largely regained both their vigour and their characteristic tone.

The finished proofs—and in particular those in which ample time had been allowed for the toning action—were of remarkably fine quality. The image, besides its agreeable colour, was characterised by a richness, vigour, and brilliancy such as is but seldom attained in the case of a gelatino-chloride print. No traces of anything resembling a stain were visible in the finished prints, nor yet in the unfinished proofs at any stage in the processes of toning and fixing. The action of the succinate bath, too, was so perfectly under control as to permit of there being obtained that desideratum of the photographic printer, a deposit of gold free from any noticeable irregularities. Altogether, the succinate bath may be confidently recommended to notice, its merits being of a kind which will be amply appreciated upon trial.

No. 3. The Succinate-Sulphocyanide Bath.—The third bath experimented with was of a somewhat different character, being, in fact, a combination of the ordinary sulphocyanide toning bath and the succinate bath. It was prepared by dissolving eighteen grains of crystallised ammonium sulphocyanide in the gold and succinate solution which had been already used for the purpose of the foregoing experiments. Previous to the toning operations the prints were washed for ten minutes, as before, and thoroughly rinsed in running water for one minute.

The action of the compound bath was found to be more rapid than that of the ordinary sulphocyanide bath, an orange-coloured print being obtained by its means in from one to two minutes. This colour being, however, far from pleasing, the prints experimented with were kept in the bath for a considerably longer period with the object of effecting the desired improvement in their appearance. The results, taken as a whole, were unsatisfactory. Toning, properly so-called, was fou to be a very tedious operation. After the primary alteration in colo very little change was noticeable in the appearance of the prints, chemical activity of the bath seeming to have become suddenly tarded in its action. Nine minutes' treatment failed to produc passable print, the tone being now a disagreeable brick-red or cr orange-brown. An immersion of at least fifteen minutes was fou necessary in every case in order to produce a brown, and even t the quality of the resulting tone was of a decidedly inferior descripti The prints were fixed for a quarter of an hour in the usual bath. T process of fixing did not noticeably alter the tone, but served rat to impart a certain degree of vigour to the prints, a feature due doubt to the setting up of a slight reducing action which had effect of accentuating the high lights. The finished proofs were jectionable only on the score of their colour, their vigour and b liancy being quite equal, if not superior, to that of work produced the ordinary way. A slight tendency towards the formation of sta was observable during the process of toning, but the subsequent tre ment which the prints received, and in particular the action of t fixing bath, appeared to rectify the mischief, as the finished pri were found to exhibit no traces of the defect in question.

On the whole, it would appear that the qualities of the combinati bath just described are not of a description such as to warrant inclusion in the list of serviceable toning formulæ.

No. 4. The Benzoate Bath.—The next reagent to receive examinati was sodium benzoate. Four grains per fluid ounce being chosen as convenient standard of strength for the purposes required, a bath the following formula was prepared:—

Sodium benzoate	60 grains.
Chloride of gold	1 grain.
Water	15 fluid ounces.

The prints, on their removal from the printing-frame, were wash for ten minutes, well rinsed for one minute, and immersed in the abo solution. The bath was found very rapid in action, from three four minutes' treatment serving to produce a good brown tone. fine warm purple tone was obtained at a later stage of the process, immersion of from eight to nine minutes serving to produce this effe There was from first to last a perfect absence of anything in t nature of staining, and the gold surface, judging from the perfe gradation exhibited in all parts of the image, appeared to be deposit with great regularity and uniformity. On immersing the wash prints in the hyposulphite bath, a marked change was instantly a parent. Those originally of a brown hue assumed a warmer an lighter tint of brown, whilst the purple prints exhibited a more decid alteration, the colour of those of a golden hue becoming now a purpl red, while the warmer-toned proofs changed to a deep rich brow The changes thus effected at the outset of the fixing process were n materially modified by the subsequent solutive action of the hypos phite. On removing the prints from the bath after twenty minut had elapsed, very little change in their appearance could be detected

The finished prints were of excellent quality, and quite equal to t class of work produced with the usual sulphocyanide toning bat The tone was not quite so rich as that produced with the succina bath (No. 2), but was of a somewhat warmer description. The fa also deserves notice that, on a comparison of these proofs with a nu ber of gelatino-chloride prints toned in the ordinary borax bath, litt difference in appearance could be detected between the prints of t one bath and those of the other.

In the case of gelatino-chloride prints, therefore, the benzoate ba might be employed as a convenient and safer substitute for the bo bath.

No. 5. The Benzoate-Sulphocyanide Bath.—The next toning bath perimented with was a combination of that last-mentioned and t sulphocyanide bath. To the benzoate bath aforesaid, which had be quite recently used, ammonium sulphocyanide was added to the amou requisite to bring up the weight present per fluid ounce to two and half grains. The salt having been dissolved, the prints, after washi as before for ten minutes and rinsing for two, were transferred to t bath containing the solution. The action at first, as was the ca with the succinate-sulphocyanide bath, was somewhat energetic, t print assuming a pale orange hue in about seventy-five seconds. Thi however, speedily changed to a light brown, after which the toni proceeded rather more slowly, until, about eight or nine minut from the time of starting operations, a very rich dark brown w obtained.

In further experiments with the bath an attempt was made to va the tone by increasing the duration of the treatment of the prin in the bath, but the result was not what was anticipated, little chan in the appearance of the image as regards colour being effected in t latter stages of the toning process. A certain loss of vigour was, i deed, observed when the treatment of the prints was carried beyon the proper stage, i.e., the eight or nine minutes' immersion require to produce the rich brown colour already alluded to. An objectionab feature in the behaviour of this bath was, that in one or two case stains and irregularly shaped patches of a reddish hue made the appearance in those portions of the image representing the deepe

lows of the subject. The continued action of the bath seemed ender these stains less conspicuous, but occasionally failed to re- e them entirely, particularly in prints in which the range of con- t was wide and the shadows very prominent. On immersing the d and washed prints in the hyposulphite bath, little change was arent in the general aspect of the tone of the image taken as a le. In the case of the stained prints, however, the stains, even n previously inconspicuous and insignificant in character, now med a pink hue and showed themselves very prominently. Apart n this defect, which was only of exceptional occurrence, the finished its were of excellent quality, and left little to be desired in the ter of tone and brilliancy. The brown colour of these prints was rather warmer shade than that produced with the simple benzoate , the image in the half-tones and lighter tints inclining towards a brownish-red in hue.

rovided the prints be thoroughly washed before toning, so as to ove all traces of soluble silver salts, and thereby to guard against risk of stains due to the presence of irregularities on the surface he image, the combination bath just described should be found y serviceable, and may be recommended for trial.

MATTHEW WILSON.

OPTICAL KNOWLEDGE IN PHOTOGRAPHY.

there is anything one might naturally suppose a photographer ld take pains to acquire, it is certainly a knowledge of the science optics, whose laws, in so many directions, expected and unexpected, uence and modify his work. Chemistry and physics play an im- tant part in the rendering and bringing forth of the picture, but ical laws have to do with the making of the picture itself, and in that respect, perhaps the more important. The photographer se mind is well equipped in all but the latter direction may not irly be compared to the artist who, thoroughly adept in the use his brushes and colours, yet neglected to obtain glasses for the edy of very bad eyesight—so bad, indeed, that only distorted vs of Nature's beauties were visible to him. Optics deal with the s of the camera, their proper working, and those facts which it ecessary to know if they are to give truthful and satisfying results he hands of their user. Singularly enough, however, the subject ns to have very little attraction for the average photographic ker, being perhaps the very last thing to which he will think of ing his attention, although, most likely, every day reminded of the alls that inevitably await those whose information in this im- tant direction is inadequate and incomplete.

t is here that the man of theory can afford a smile of gratification t, once in a while at least, he has the advantage over his somewhat ercilious and opinionated brother, the man of practice. When the er is sorely vexing his brains over the mysterious behaviour of lenses at short focus, or with subtle questions of their covering ver and definition, the former is probably fixing on another lens, calmly unscrewing the combinations, as his better scientific know- ge suggests, arriving quickly, and by a short and easy route, at goal which the other will only attain, if at all, after much experi- nt and worry. An immense amount of toil and trouble would be ed, in outdoor work especially, by an even moderate acquaintance h the different properties and functions of the various lenses em- yed. How often are three or four bulky and heavy objectives ried some considerable distance for the purpose of photographing hop or building, and, on arrival, it is found that none of them are table for the required size, at the distance available. It is very lom that any one at all conversant with the principles of optics uld be caught in such a trap, for very little calculation would easily ble them to ascertain beforehand the probable length of focus that uld be required for their purpose, and to select the suitable lens. ny instances, too, can be recalled where a familiarity with the nstruction and arrangement of the different parts of a lens would extremely valuable, for it is often in the photographer's power to ke his objective answer for different purposes, by a slight altera- n in the combinations. As an example, it is positively surprising w many workers, on inquiry, are found to be unaware of the fact t the back portion of a rapid rectilinear lens forms, when the nt is removed, a very serviceable single lens of long focus, which, some one lately remarked, is admirably adapted, among other things, pictorial landscape work. And thereby hangs a rather amusing e. A young and zealous amateur, coming into possession of the ore-mentioned interesting fact, was tempted to put it into practice bright summer afternoon. There was, lying before him, a very ractive bit of woodland scenery, the background of which, especially isfied his sense of the fitness of things. Finding that this ap- ared comparatively small and unimportant, as viewed at the usual tance with his rectilinear lens, and also that it was, for one rea- or other, unsatisfactory at closer quarters, he resolved to unscrew front of his lens, and use the back portion only, thus obtaining larger and more effective view of the admired and distant sylvan uties. He forgot, however, one most important point, that his nera was of rather short extension, and while racking out eagerly, with head under the focussing cloth, there came a sound that filled him with alarm—the ominous rip of leather parting from the back. It was a sad and disillusioned man who spent the greater part of the evening, not in developing ideal negatives, but in glueing down and repairing his damaged bellows, and, perhaps, reflecting uneasily that if he had only known more about the much greater length of focus that a single lens, in such circumstances, would require, he would have been decidedly better equipped.

One is occasionally compelled to notice that all our cameras, nowadays, are not invariably made with due regard to fulfilling certain optical requirements. The old grievance, for instance, of misleading finders and spirit-levels in hand cameras is by no means a thing of the past. Coarse and unsuitably ground focussing screens are yet another easily avoidable evil that should be reformed out of existence. Opticians may congratulate themselves that that part of the photographic outfits for which alone they have had the entire responsibility—namely, the lens—is certainly the one that shows the most improvement and the greatest relative perfection.

The face of the average photographer is indeed a study of picturesque bewilderment when he has to deal with such problems as those relating to the difference between chemical and visual focus, and other innocent little matters that lurk unsuspected in his everyday practice, waiting but the opportunity to confuse and overthrow him. It is regrettable to notice the number of times that queries such as the necessary length of studio for a lens of certain focus are requiring answer in the correspondence columns of the photographic journals. Quite recently the amazing question was propounded whether a 15×12 camera and lens could be used for taking cabinet portraits—asked in all seriousness, and answered by a long-suffering editor!

It is scarcely necessary to speak of the great advantage of optical knowledge when such operations as copying or enlarging have to be undertaken. A large amount of guess-work and experiment is done away with when the worker is but acquainted with a few simple rules and formulæ. The trouble and difficulty of getting a copy or enlargement of a certain definite size are reduced to a matter of easy calculation and measurement, and valuable time and energy conserved for other work. There are some details connected with studio lighting and operating, where the comprehension of optical laws becomes requisite, and is likely to prove of great assistance. The effects of light falling at various angles, and the different ways in which it may be reflected, are well worth careful study and consideration. In the dark room, too, much may be learned of what constitutes a safe light for working, and how, by photographing the spectrum colours on the plate to be employed, it may be ascertained, decisively and easily, what manner of light such a plate may be exposed to with immunity. We will say nothing of the absolutely indispensable need of optical knowledge of a high order before any creditable results can be accomplished in the departments of orthochromatic and tricolour photography, cinematography, and microscopic work. It is, presumably, only those in possession of such a knowledge who would undertake to explore in these directions.

The general level of optical wisdom among photographers, professional and amateur, far from satisfying as it is, is undoubtedly better than it used to be, not so long ago. The use of such fittings and parts of the camera as the swing-back and rising and falling front, are fairly well understood by the majority. Perhaps, also, the more general adoption of backed plates, as a preventive of halation, may be credited as one of the results of better knowledge, for halation is most certainly an optical rather than a purely photographic phenomenon. A larger acquaintance with the principles involved in the action of instantaneous shutters is also fairly evident, as shown by the slowly growing popularity of those of the focal plane type.

It may be profitably pointed out that the City and Guilds of London Institute in their examination papers on photography, pay particular attention to the optical aspect of the subject, and in their instruction devote a considerable portion of time to that branch. It can fairly be said that the photographer who has gone creditably through their syllabus, and obtained a diploma, has laid up for himself a rich store of useful and invaluable knowledge of the optical requirements of his profession. It is a pity that so few avail themselves of the teaching now so accessible to them. To decry theoretical attainments is rather the fashion, and to proclaim from the housetops the ancient truism that an ounce of practice is worth a pound of theory. No doubt it is, but equally undeniable is the fact, taught by experience, that work of any kind is always better and more intelligently performed, besides being far more successful, when the underlying theory is well understood and appreciated.

A. LOCKETT.

News and Notes.

PROFESSOR R. W. Wood, of the University of Wisconsin, has been appointed professor of physics in the John Hopkins University, in succession to the late Professor H. A. Rowland.

It is stated that Sir Norman Lockyer, whose retirement from the Astronomical Professorship at the Royal College of Science has been announced, resigns in October.

At the Royal Photographic Society's Technical Meeting, on Tuesday, June 25, at 66, Russell-square, M. T. Thorne Baker will read a paper upon "The sensitive compounds of the chromium family."

Mr. W. F. Slater, of 5, Firs-parade, High-road, Lee, is issuing a programme of a photographic excursion to the Rhine Valley and Ahrgau, to be personally conducted by him, from July 13 to July 22.

The "Photographic Art Journal."—The first four numbers of the "Photographic Art Journal" are before us. Devoted to pictorial photography, the "Photographic Art Journal," is published monthly, price fourpence, at St. Martin's, Leicester. The journal is well produced, and the reproductions of photographs and critical notes should interest a rapidly growing class of advanced pictorial workers.

The Hackney Photographic Society's Annual Exhibition will be held on November 6, 7, and 8, next. The following are the open classes:—F. Portraiture and figure studies; G. Landscape, seascape, and river scenery; H. Architecture; I. Stereo (sets of four); J. Lantern slides (sets of four). Awards—One silver and one bronze medal in each class; gold medal for best picture in classes F to H; silver medal for best trade exhibit; bronze medal for most useful novelty.

"The Photographic Chronicle."—Under this title a new journal is issued by Dean's Publishing Company, Limited, 55 and 56, Chancery-lane, W.C. The 'Chronicle' is to appear fortnightly, price 2d. Edited by Mr. John A. Randall, the aim of the new-comer is to be "A 'Chronicle' of the photographic passing hour, and to constitute itself a newspaper, every effort being made to keep readers well informed by supplying them with the latest facts, events, and topics current in photographic circles." "The Photographic Chronicle" has our best wishes for a successful career.

The death is reported of Mr. Thomas Ayres, in his seventy-ninth year, at 8, Regent-road, Yarmouth. The deceased gentleman was widely known in the town, having resided there since 1840. He first commenced business as a jeweller, and retired from business for a short time, but afterwards resumed business life as a photographer in Regent-road. At the time of his death he was one of the oldest photographers in the Kingdom. Mr. Ayres was an ardent astronomer, and at one time his letters to the local journals on astronomical subjects were greatly prized, and we are informed that during the weary hours of his last illness, he wrote a paper at considerable length on "The History of the Sun and Moon." He leaves a widow and eight children—four sons and four daughters.

National Photographic Record Association.—At the last meeting of the Council, Sir J. Benjamin Stone in the chair, 246 prints were presented, including twenty-seven of old houses of London, by the Duke of Bedford; thirty-three of historical buildings of Somersetshire and Warwick, by Mr. B. E. Lawrence; a valuable collection by the Herefordshire and Hull Photographic Societies; fifty-seven from Yorkshire, by Mr. G. Bingley; sixteen of old London houses recently removed, by Mr. H. Bedford Lumere; twenty-six of the historical London houses, by the Hon. Secretary, Geo. Scamell; a series of Copford Church, by the Rev. Moncrieff Smyth; and other contributors. The total number of prints now received amount to 1956, and an addition of over 300 promised are shortly expected.

Length of Summer Days.—It is popularly supposed that the 21st of the present month is the longest day of the year, and that there is more time available for photographic operations on that date than on any other. As a matter of fact, if a reference is made to "Whitaker," it will be found that on the 18th the day begins at 3.44 and ends at 8.17; this rate and time continue till the 22nd, when the beginning of the day is a minute later and its end also a minute later; these times continue till the 26th, so that as a matter of fact the day a week after the reported longest, ends really a minute later. Though these data have little bearing for practical photographers, it is well to draw attention to them as the question so often crops up in photographic discussions.

An important exhibition will be opened at the Holland Fine Art Gallery, 14, Grafton-street, Bond-street, W., on June 26. It will consist of the original drawings which have been specially made by the leading artists of Europe and America for the new Illustrated Bible, shortly to published by the Illustrated London News and Sketch, Ltd., on behalf of the Illustrated Bible Society. Among other artists the work of the following will be represented: Mr. E. A. Abbey, R.A., Sir L. Alma Tadema, R.A., Sir E. Burne-Jones, Mr. Walter Crane, Mr. Frank Dicksee, R.A., Mr. J. M. Swan, A.R.A., Mr. Briton Rivière, R.A., M. J. L. Gérôme, M. Benjamin-Constant, M. J. Israels, M. Jean Paul Laurens, M. Puvis de Chavannes, M. J. J. Tissot, Mr. Fritz von Uhde, Professor Max Liebermann, Signor Franco Paulo Michetti, Signor Giovanni Segantini, and M. G. Rochegrosse.

The Spectacle Makers' Examination Results.—The following are the names of those who were successful at the May examination of the Spectacle Makers Company, entitling them to the diploma:—Passed full examination—Messrs. H. G. W. Husbands, Bristol (Honours); J. E. Birdsall, Skipton; R. P. Lamb, Cheltenham; V. H. Mackinney, London; A. E. Marsh, London; B. A. Smart, Cambridge. Passed modified examination—Messrs. W. M. Alexander, Kelso, N.B.; E. S. Blair, Belfast; G. Davies, London; A. H. Dyson, Windsor; C. S. Fraser, Brisbane; T. C. Gardner, London; E. C. Mackinney, London; W. McSkimming, Kirkcudbright, N.B.; H. A. E. Palmer, Tewkesbury; J. Prescott, London; W. Roberts, Pontlottyn; R. Robson, Wakefield; M. Smith, Kidderminster; E. H. Tugwell, London; W. E. Warner, London; and J. B. Wilson, Dorking. The examiners were Professor Silvanus P. Thompson, B.A., D.Sc., F.R.S., Mr. G. Lindsay Johnson, M.A. M.D., B.S., F.R.C.S., Rev. J. Henry Smith, B.A., Mr. W. H. E. Thornthwaite, F.R.A.S.

The Society of Arts and Photography.—On Friday last, the Council of the Society of Arts attended at Marlborough House to present to the King the Albert Medal of the Society, in recognition of the aid rendered by His Majesty to Arts, Manufactures, and Commerce during the thirty-eight years' Presidency of the Society. It may be interesting to some of our readers to know that the first photographic exhibition in this country was held in the rooms of the Society of Arts; also that the Photographic Society, now the Royal, was formed, and held its earlier meetings, in the rooms of the Society of Arts—that dates back to 1853. The first President of the Photographic Society was the late Sir Charles Eastlake, then President of the Royal Academy, and amongst the Vice-Presidents were Sir William J. Newton, the celebrated miniature painter, and Charles Wheatstone, F.R.S., so that art was at its beginning well represented at the new Society. The late Queen, and her consort, Prince Albert, shortly after the formation of the Photographic Society gave it their patronage. For many years the old South London Photographic Society, through the kindness of the Society of Arts, held their meetings in its rooms.

Photographing on Wood.—We are frequently asked by correspondents for a method of producing photographs on wood blocks as a basis for the wood engraver to work upon. Now there are many ways of doing this which have been suggested, but in most of them a film of some sort is employed—collodion, varnishes, carbon films, &c. But the unfortunate part of them is that the film splits up under the graver, thereby rendering the photograph, practically, of little use as a guide. In the "Foreign Notes and News" last week, we quoted from a foreign contemporary a formula for making photographs on wood. The formula does not seem particularly clear, though we have not tried it; but it appears to us that it is not well suited to the purpose of the wood engraver; for the reason that it involves a film on the block. It is stated that the wood block, before the powder is rubbed on, should be previously coated with celluloid varnish. We should imagine that a film of this varnish would prove quite as objectionable to the wood engraver as one of collodion, albumen, gelatine or any other. Perhaps, however, the method is not intended for the use of the wood engraver, but only as one for producing photographs on wood and simply to remain as such.

Commercial & Legal Intelligence.

We have received an abridged catalogue of photographic apparatus supplied by Messrs. Sanders and Crowhurst, opticians and photographic dealers, of 71, Shaftesbury-avenue, W.

The directors of Kodak Ltd., have declared an interim dividend on the company's preference issue for the quarter ending June 30, 1901, at the rate of six per cent. per annum, and on the ordinary shares at the rate of ten per cent. per annum for the same period, which dividends will be payable on or after the 1st proximo. They have further resolved that the transfer books be closed from the 13th to the 30th inst., both days inclusive.

We learn that Mr. T. K. Grant, who for some years past has represented Sandell Films and Plates as demonstrator and traveller, has accepted the position of London manager of the Lumière (N.A.) Company, Limited, 78, Queen Victoria-street. Mr. Grant, who is a well-known member of the London and Provincial Photographic Association, is an able photographer and man of business, and we are confident that in his new position he will have the best wishes of his many friends, and will meet with every success.

From Mr. J. Fallowfield, of the Central Photographic Stores, 146, Charing Cross-road, London, W., we have received a special list of hand cameras, lenses, and sundries, for the present season. The list is dated June, and extends to forty-eight pages. Mr. Fallowfield is of opinion that the present season will be an exceptionally busy one. The list before us is issued as a supplement to the firm's well-known annual. The latest novelties are mentioned in its pages, and all classes of photographer should find it useful for consultation. It is sent post free on application. Accompanying the special list is an eight page pamphlet, detailing a number of special lines of interest to professional photographers.

A Novel Trade Mark.—In the annexed silhouette our readers will trace some resemblance to the profile of Mr. S. Herbert Fry, the well-known trade printer and enlarger, of 12, South Villas, Camden-square, N., who



has adopted the little picture as a trade mark. It is, perhaps, unnecessary to point out that Mr. Fry in his business appeals exclusively to the trade and the adoption of the distinctive trade mark is part of his business policy which, no doubt, will be appreciated by his extensive clientèle.

The Warwick Competitions.—The list of awards of the Warwick Competition for June is as follows:—£10 prize—Mr. J. C. Lee, Market-place, Ashbourne, "A landscape. £5 prize—Mr. J. A. Draycott, photographer, New-street, Birmingham, "A portrait." £1 prizes—Messrs. R. A. R. Bennett, Walton Manor Lodge, Oxford, "Double photograph of child;"

W. J. Brooke, Frodingham-road, Scunthorpe, "Spring sunshine;" H. T. Brookes, Stanley-street, Lindley, Huddersfield, "In a fir wood;" H. B. Cookson, Kinswinford, Staffs, "Farmyard;" H. C. Leat, Richmond-street, Totterdown, Bristol, "Woodland sunshine;" F. H. Lloyd, Barrow-road, Streatham Common, S.W., "The castle mill;" R. R. Miller, Hatton-gardens, Newark, Notts., "Southwell Cathedral, south door;" D. Murray, photographer, Queen-street, Wolverhampton, "A study;" C. Ponting, Flosh House, Keighley, "At sunset;" W. R. Prior, Grafton-street, C.-on-M., Manchester, "Race for Manchester Cup;" J. Shaw, Clifton Park-avenue, Belfast, "Half-mile steeplechase;" F. C. Smithard, Rose Hill-street, Derby, "Road near Ticknell;" H. Thompson, Inglewood-road, Sparkhill, Birmingham, "Teacher;" J. C. Warburg, Pembridge Gardens, London, W., "Simple Simon;" G. C. Wickens, West-hill Drive, Mansfield, "Sunlight and shade;" J. G. West, Cathedral-road, Cardiff, "Boys fishing in stream;" E. H. Williamson, The Poplars, Monks-road, Lincoln, "On Brayford;" T. Wright, Loughborough-road, West Bridgnorth, Nottingham, "Reverie;" Misses M. Craigie Halkett, Percy House, Eltham, "Chums;" H. M. Hastings, John-street, Stratford-on-Avon, "Maiden Meditations."

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to the Rev. T. Gough, Grammar School, Retford, Notts., for his negative "Church of the Certosa of Pavia."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
24	Bradford Photo. Society	Discussion: *Carbon*. Opened by F. Nicholson.
25	Birmingham Photo. Society	*Elementary Chemistry for Photographers*. C. F Townsend.
26	Thornton Heath	Excursion: Zoological Gardens.
27	London and Provincial	Annual Meeting.
29	Bradford Photo. Society	Excursion: Otley, for Washburn Valley. Leader, A. Keighley.
29	Croydon Microscopical Society	Excursion: Gravel Pits at Greenhithe. Conductor, N. F. Robarts, F.G.S., or G. W. Moore.
29	Hull	Excursion: Adel.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 13,—Mr. R. P. Drage in the chair.

Mr. A. L. Henderson said that it would be remembered that he had denounced as useless to the expert photographer the aid afforded by actinometer or exposure meters. He now passed round a form of view meter devised by himself a few years ago, and intended to show the angle of a given view that one might wish to photograph. It was, he continued, just about as useless as the actinometer. It consisted of an iris diaphragm mounted in front of a circular hole cut in a metal plate. The eye was placed at the hole and the diaphragm adjusted until the desired angle was included from which one would determine the lens to be employed. All of these devices added to the weight of an outfit, but were really of little use to any worthy the name of a photographer.

Siena.

Mr. A. L. Henderson gave a lecture upon this Italian city, illustrated by a series of very fine photographs taken during his recent travels in that part of Europe. Siena lies out of the beaten track of the ordinary tourist, in Central Italy, and to this fact much of its fascination for Mr. Henderson and his party was ascribed. Situated some 1330 feet high, it is one of the pleasantest towns in Tuscany, and as it is supposed to have been founded by Julius Cæsar or Augustus, antiquity lends considerably to its charms. The city is approached by several old gates which make most picturesque views, as Mr. Henderson's slides showed, and its streets, narrow and crooked, contain many fine old churches and examples of Italian Gothic architecture of the thirteen and fourteenth centuries. For the art student it is a city that has a great attraction, some of the mosaics and the tapestry paintings being very fine examples of some of the great masters. Mr. Henderson, as a rule, likes to depict as much as possible of a place by means of panoramic views, but in Siena he found that practically only two such views could be got—one from the cathedral and another from a high tower. The cathedral is very richly decorated inside, and the altars make pictures that have only to be seen to be admired. The painting here, again, are very fine specimens of work. Mr. Henderson was cordially congratulated upon the excellence of these his latest pictures, and a hearty vote of thanks was passed for his lecture.

PHOTOGRAPHIC CLUB.

June 12.—Mr. Hans Muller in the chair.

Mr. F. A. Bridge passed round the programme of the Oxford Convention in French, as issued by the Union Internationale de Photographie, whose members are expected in considerable force at the joint meeting of the Continental organization and the P. C. U. K.

The case of an American piracy of a photograph copyright in this country was discussed at some length, especially in regard to the fact that the reproductions had been published also in England. It was considered that the owner of the copyright would have a good case against the publisher in the United Kingdom, and should recover easily the penalties and damages prescribed by law.

Mr. W. Webster's researches into the curative properties of X-rays in regard to lupus and skin complaints as detailed in his recent lecture at the Royal Photographic Society, were discussed at some length, as were also the details, more particularly concerning photographers, that he made public.

N. Middlesex Photo Society.—June 17.—Mr. H. W. Bennett, F.R.P.S., gave an elementary lecture on "Platinotype." He confined his remarks to the paper manufactured by the Platinotype Company. To get warm tones the stock solution should be diluted with two parts of water, and the prints developed at a temperature of ninety degrees Fahr. If the developing solution was below sixty degrees, the prints were poor in quality, and the shadows degraded.

Patent News.

The following applications for Patents were made between May 28 and June 8, 1901:—

Film Photography.—No. 10,911. "Improvements in Films, Film Spools, and Indicating Devices for Cameras and Roll Holders." John Edward Thornton and Charles Frederick Seymour Rothwell.

Cameras.—No. 10,936. "Improvements in or connected with Photographic Cameras." Arthur Charles Smith.

Printing Frames.—No. 10,939. "Improvements in Photographic Printing Frames." William Elliott Debenham.

Optical Projection.—No. 11,047. "An Improved Method of, and Apparatus for, the Projection of Animated Photographs on to a Screen." Ernest Thomas Saunders.

Dark Room Lamps.—No. 11,107. "Improved Oil Lamp for Use principally in Photographic Dark Rooms or the like." John Howard Ross.

Printing Frame.—No. 11,138. "An Improved Combined Photo-printing and Vignetting Frame." William Armstrong and William Robert Owen Chambers.

Cameras.—No. 11,184. "Improvements in or relating to Photographic Cameras." William James Lancaster.

Producing Photographs Rapidly.—No. 11,232. "Improvements in Apparatus for rapidly Producing Photographs." (La Société Anonyme de Photographie Automatique Inalterable et Instantanée, France.) William Phillips Thompson.

Film Carrier.—No. 11,297. "An Improved Film Carrier and Dark Slide for Photographic Cameras." William Henry Tomkinson.

Process Work.—No. 11,300. "Improved Method of Preparing Pictures for Production of Process Blocks." Edward Wilson-Smith.

Cameras.—No. 11,456. "Improvements in Photographic Cameras." Aloys Stalinski.

Film Rolls.—No. 11,622. "An Improvement in Photographic Film Rolls." Complete specification. John Brown Haddow and Samuel Nelson Turner.

Packing Plates and Films.—No. 11,635. "Improvements in Packing and Using Photographic Plates or Films, and Apparatus connected therewith." John Edward Thornton.

Cameras.—No. 11,696.—"Improvements in Photographic Cameras." Felix Ottersbach.

Colour Sensitising.—No. 11,719. "Process of rendering Silver-haloid Layers sensitive to Rays of different Degrees of Refrangibility. (The Actien Gesellschaft für Anilin-Fabrikation, Germany.) Charles Denton Abel.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PRICE-CUTTING AND THE KODAK'S POLICY.

To the Editors.

Gentlemen,—Will you kindly allow me to briefly reply to the comments on my previous communication, made by the correspondent who wrote under the name of "Anti-Coercion" in your last week's issue? You correspondent remarks, "Were it not deplorable in the interests of photography, it would be amusing to watch the advocates of 'no coercion' standing first on one leg and then on the other. It is tyranny when they are told they must not sell any other than Kodak rollable film, but when we come to the dictation of the Manufacturers and Plate-makers' Association, with their refusal to supply any dealer who sells under list price, tyranny and coercion disappear from their vocabulary and we hear of protection of the interests of the public. This is rank hypocrisy, and epithets such as 'price-cutting,' 'the supply of American goods,' and professions of 'desiring to maintain the best possible standard,' and 'studying the convenience

of the public,' are a mere pretence for keeping the trade in the swaddling clothes of large profits and small returns."

In the first place, I would like to say that I may have the interests of photography quite as much at heart as your correspondent. Further, I have no brief either for the manufacturers or the dealers. What I wrote was purely a personal expression of opinion, and it is quite possible that I gave expression to fallacies; but to suggest that what I wrote was rank hypocrisy, as your anonymous correspondent was good enough to do, was, to say the least, hardly polite.

I was well aware when sending you my previous communication that I was laying myself open to certain criticism; but I am not yet convinced that indiscriminate price-cutting among the manufacturers of plates and papers would be to the benefit of the consumer in the long run; although, of course, I may be wrong. Whether the dealer should be allowed to charge whatever he pleased for plates and papers is another matter. I readily recognise that it would pay many dealers to do so. I have no doubt that some dealers would sell at a loss if thereby they could drive a competitor to the wall. Of course, I admit that the public does not exist merely for the benefit of the dealers, although I know some dealers have an idea that it does. The average dealer is ready to assist his customers to the utmost of his ability.

We have been informed that the Plate-makers' Association has practically ceased to exist. It has been generally known that some of the leading plate and paper manufacturers had long since ceased to be members of the said Association. But I believe it is still a fact that most of the manufacturers charge uniform prices for their plates and papers. There is, so far as the writer is aware, no question of inflating prices; or the desire to create a monopoly by any one firm. Therein lies the difference, I take it, between the British plate and paper manufacturers and the Kodak Company. The latter endeavoured to create for themselves a sort of perpetual monopoly in rollable film. They have failed, as they deserve to fail. When the Kodak Company commenced manufacturing P.O.P. and bromide papers they did not study the interests of the British manufacturers, so why on earth they should be so sensitive to competition themselves, it is not easy to understand.

I must agree with some of your correspondent's remarks. He says: "Such is the spirit of the dealer, I am sorry to say, that I find him frequently slurring goods of high quality, or holding them back, in order to push the sale of others upon which he gains a slightly larger profit." I do not know why, but there are many really good articles made by British firms, and sold at a moderate price, which are rarely seen in many dealers' establishments. It would probably pay some of the manufacturers to advertise their goods to a greater extent in the general press and trade direct to the customer. There must be a very large number of photographers and prospective photographers who never see a photographic journal. This is unfortunate, but the truth of it can hardly be disputed.

Although the Plate-makers' Association may have practically ceased to exist, it does not follow that henceforth the dealers will be allowed to sell plates and papers at whatever prices they please. There is no doubt that an enormous amount of money is swallowed up in the mere distribution of goods for which, of course, the consumer has to pay. But how this money can be saved is a big problem to discuss.

If I wanted a size of plate not ordinarily stocked by the dealer, the manufacturer would charge me carriage on them, if ordered direct, whereas if I go to the dealer he will order them, and I would have no carriage to pay. Similarly with other goods. At present it is clearly an advantage to go to the dealer. Possibly, as your correspondent "Anti-Coercion" seems to suggest, this is a part of the general conspiracy among the manufacturers.

Possibly the time may come when the consumer will be part-proprietor of works run for the benefit of the consumer only, and not to make huge profits. I have no doubt that every manufacturer of photographic plates and papers is a millionaire, or something approaching to it. The dealers, too, must all be making their fortunes rapidly. Well, we are to have more competition in the same line, and possibly the policy of allowing the dealers to sell those goods referred to at any price they please will be adopted, and "Anti-Coercion" will then be satisfied.—I am, yours, &c.,

J. A. REID.

June 14, 1901.

To the EDITORS.

GENTLEMEN,—Referring to a letter signed "Anti-Coercion" in this week's BRITISH JOURNAL OF PHOTOGRAPHY, I am much amused at the ignorance (or is it wilful perversion of the truth?) displayed by some of your correspondents in their virulent attacks on the "wicked dealer." "Anti-Coercion" writes: "At the present time dealers' profits are extravagant." I would like him to compare a photo. dealer's profits on plates and papers with the profits made by his butcher, his baker, or his grocer, and then take into consideration the fragile and perishable nature of a dealer's stock, such things as rent, wages, advertising, carriage on goods which a dealer frequently has to pay, and the discount the professional can demand from him if he buys £2 or £5 worth of goods, and possibly he might describe the nett balance by a different adjective. Compared to the profits of a dealer, say, in clothes or provisions, articles of constant consumption, the photo dealer's profits are very moderate, not to say paltry. If such correspondents, instead of whining in print, were to take advantage of the terms offered by the various plate and paper-makers to professional photographers, and buy their plates, &c., in £2, £5, or £10 lots according to their needs, the balance of profit left to the dealer who supplied them need not cause any feelings of envy. The photographer should exercise a little business foresight in these matters, and buy his plates, &c., the same as he buys coals, &c. The man who buys one hundredweight of coals does not expect or get the same terms as the man who buys five or ten tons. I expect your correspondent will reply to this and say that plates and papers will not keep in good condition for any length of time. This argument, however, will not serve, for most plates and papers are known to keep perfectly for months, if not years, and moreover a photographer who cannot use, say, £5 worth of goods in two or three months, must be doing a very small business. I should think it would pay him better to get a broom and sweep a crossing for a livelihood.

I hope your future correspondents on this "evergreen" subject will make themselves a little conversant with facts before rushing into print with their supposed grievances. I might retaliate and designate the gross profits of the average professional as enormous; but I will be merciful, because I well know the difference between gross and nett profits, and that, enormous as are the professional's profits on any one transaction, by the time he has paid his various business expenses the balance remaining is seldom more than a fair return for his talent and the capital he has invested. Cannot your anti-dealer correspondents treat the dealer in a similar spirit? Live and let live.—I am, yours, &c.,

WILFRED EMERY.

15, Anson-parade, Cricklewood, N.W., June 14, 1901.

THE ASSOCIATION OF MANUFACTURERS OF PHOTOGRAPHIC PLATES, PAPERS, AND FILMS.

To the EDITORS.

GENTLEMEN,—I observe in THE BRITISH JOURNAL OF PHOTOGRAPHY of June 14, page 383, a foot-note by the Editors to "Anti-Coercion's" letter, which states as follows:—"'Anti-Coercion's' antipathy to the Plate-makers' Association, or 'ring,' as he prefers to style it, may be appeased by the information which we have received on excellent authority that the Association is practically non-existent." Will you, Messrs. Editors, be good enough to allow me to state that your excellent authority is totally wrong? For the Association goes on with perfect unanimity amongst its members to protect articles of their manufacture against the cutting of prices, which has been so fatal to many trades. In this they consider they best protect the interest of all professional photographers, as well as those who trade in photographic goods. The Association meets the third Thursday of every month, and meets to-morrow, as usual.—I am, yours, &c.,

W. J. EALES, Secretary.

London Chamber of Commerce, Botolph House, Eastcheap, London, E.C., June 19, 1901.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—May I suggest that the P.P. Association issue certificates of membership, that we may have them suitably framed to hang in the studio or reception room to show clients that we have some Society to look after us after the manner of the chemists, &c. Of course, any profit arising from sale of such would benefit funds of the Association.—Yours, &c.,

OTHELLO, A.P.P.A.

June 16, 1901.

[A very good suggestion which we engage shall not be lost sight of.—EDS. *B.J.P.*]

THE SEASIDE CAMP FOR LONDON WORKING BOYS.

To the EDITORS.

GENTLEMEN,—The London working boy is beginning to think about his holiday. The east wind has gone. The June sun is shining. The cash-desk, the workshop, the engine-room become at times well-nigh intolerable—well-nigh, but not quite, because, to those lucky lads who have "sampled" the camp before, there is the bright, refreshing anticipation of at least seven days by the rippling sea.

In perfect confidence that his expectation will be realised, the tired little workman sends his letter to The Seaside Camp Secretary:—"Dear Sir.—Please send two camp forms. Me and my mate wants to come to Bexhill again." Would that the Committee could share the lad's confidence as to his eagerly expected holiday. The camp funds are far below what they were at this time last year. The weather promises well, the lads are eager, the camp is ready—but the money is lacking.

We appeal most earnestly to your readers to see to this, to enable

he Committee to justify the confidence that hundreds of hard-working ads whose life is so "humdrum," whose holidays are so few, are lacing in them. The boys contribute towards their expenses, but t is utterly out of their power to provide all that is needed in order hat they may receive a holiday which does so much to secure another ear's health and vigour for the work which helps to bring bread for he home.

This effort to substitute a well-ordered holiday, under careful and xperienced supervision, for a period of street-corner loafing, of expoure to all manner of evil temptations under the supervision merely f the police, has our warmest approval. To quote from last year's eport:—"The opportunities for religious influence are manifold, and he mere realisation, which cannot fail to come to each lad in camp, hat unselfishness and consideration for the feelings of others, must n the end add to his own enjoyment, is in itself a basis for moral raining which is invaluable," and we venture to ask for the money which is needed if the work is to go forward.

Contributions will be gratefully acknowledged by Mr. F. Abel Bloxam, the Secretary, at Northumberland-chambers, Charing-cross, r may be paid direct to the bankers, Messrs. Cocks, Biddulph, and Co., 43, Charing-cross.—We are, yours, &c.,

A. F. Londin, President.
Arthur J. Ingram, Chairman of Committee.
Everard A. Ford, Hon. Treasurer.
F. Abel Bloxam, Secretary.

June 11, 1901.

BLOOD POISONING BY BICHROMATE OF POTASSIUM.

To the Editors.

Gentlemen,—I note in your "Answers" of last issue in reply to "Carbon," you state that you have never heard of the symptoms of bichromate poisoning as described by your correspondent. It may be of interest to you to hear that an assistant of mine contracted blood poisoning which the doctors all agreed was undoubtedly caused by bichromate of potash. It first broke out on his hands in the form of a rash chiefly round the nails. He was troubled on and off with this for some time, and last August, when the weather was so very hot, it spread to his face in the form of a violent red rash, very painful and irritating. Round the eyes and nose it was exceedingly bad. He had to go into a hospital, and was nearly three months before he was well again. The doctors told him never to do carbon printing again, or it would return. They especially warned him against exposing himself to the steam or vapour arising from the hot water used to develop.—I am, yours, &c., Wilfrid L. Jenkins.

116, Cromwell-road, South Kensington, S.W., June 14, 1901.

A DIFFICULT WORD TO DEFINE.

To the Editors.

Gentlemen,—A cynic has said that an amateur photographer is one who makes money by means of photography, whereas a professional is one who tries to. A great deal has been written from time to time on this subject, yet those who could precisely define the term "amateur photographer" are probably not very numerous. The dictionary defines the word "amateur" in the following terms:—One who follows any science, art, or occupation, not from pecuniary motives, but from a love of it, and who, as a rule, is not so proficient in it as if he had to depend upon it for a livelihood.

A great many so-called amateur photographers receive, in the course of a year, a considerable sum for their photographic work from various sources; and the question arises: Can there be a category which would include those who are not orthodox professionals? At one time, a generally accepted definition of a professional was one who derived his income, or a portion of his income, from the pursuit of photography. Now it has become the fashion for many amateur photographers to compete in the various trade competitions, the prizes being in several cases considerable sums of money. Sometimes, too, one of the monthly magazines will offer a hundred pounds for the best photograph of a baby, or some such subject; and this naturally offers a glorious opportunity to a large number of amateur photographers. Then many of those who are generally described as amateurs are constantly contributing photographs to the illustrated press. In fact, some of them might be described as journalists, and one would naturally think that when writers make considerable use of their own photographs to illustrate their matter, they are to all intents and purposes, professional photographers. They could hardly be described as bonâ-fide amateurs, although some of them, no doubt, would feel hurt were any other description applied to them. Most editors of illustrated journals are open to accept suitable matter from any source, and many of those usually described as amateur photographers are aware of this. The amateur plays an important part in modern journalism. And in the case of photographs, amateurs, as a rule, can afford to accept a less reproduction fee than professionals. This being so, editors will frequently give the former the preference. The writer was once informed by the editor of a well-known magazine that, to illustrate a certain subject, he had been offered any number of suitable photographs taken by amateurs, for a very small fee. And as, after all, journalism is not much more than a trade, although it used to be considered a profession, we may presume that he accepted as many photographs as he required. It is all very well to say that the professional photographer or journalist should be in a position to ignore such competition; but the amateur is frequently a person of ability, wealth, and of leisure. He (or she) is therefore frequently in a position to compete successfully with the professional.

Many amateurs endeavour to make pictures by means of photography, and some make every effort to sell them too. Are the latter bonâ-fide amateurs? Where is the line to be drawn? Is it possible to be a professional without having an orthodox establishment?

Possibly an amateur may do any or all of the acts referred to above, and still retain his amateur status. At any rate, if terms are used, it surely ought to be possible to define them.—I am, yours, &c.,

June 14, 1901. Inquirer.

A CASE OF BAD FAITH.

To the Editors.

Gentlemen,—About eighteen months back we employed a firm of professional enlargers to do a carbon enlargement of a young lady, which was executed in due course. A few days back the friends of this young lady called here to know if we had a studio in a distant county town from here, as at one of the principal studios in that town an exactly similar enlargement was being exhibited. Having no connexion with the studio named, we wrote to the proprietor, who, as we subsequently ascertained, forwarded our letter to the firm we employed for the original enlargement. In due course we received a letter from them, acknowledging it was an enlargement from our negative, and apologising for having sent it out, as the transparency had got mixed up with their own. This, of course, is a ridiculous excuse. After an experience in professional photography for just forty years, this, we are happy to say, is our first experience of the sort. We write to ask your advice as to our remedy? Our customer shares our own annoyance in the matter.—We are, yours, &c.,

1, Sussex-place, Southampton. Debenham and Smith.

[This is a very discreditable thing, and one cannot be surprised that Messrs. Debenham and Smith, as well as their client, are greatly annoyed at it. The explanation, or excuse, made shows, to say the least of it, that there must be gross mismanagement in the establishment from which the specimen enlargement was sold, otherwise their own transparencies would not get mixed up with those of customers. In reputable enlarging establishments all work entrusted to them is treated with the greatest confidence, and every care is taken that the negatives forwarded to them are used for no other purpose than that of the client. We again say the thing is disreputable, and shakes confidence in those who trust their negatives out of their hands. We should like to know the firm who made this "mistake."—Eds. *B.J.P.*]

COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—My attention has been called to your somewhat sarcastic comments upon my claim—in connexion with M. de Lubicz, a Polish artist—to an invention in colour photography.

We, in this country, always pride ourselves upon our sense of justness and fairness, and, without wishing to comment further upon your article, I beg to say that I shall be pleased, not only to see you or your representative on the subject of our invention, but also to show you or him one of the prints which we have already obtained, and which, though far from being perfect, will nevertheless give any expert a very accurate idea of the possibilities of our discovery.

M. de Lubicz and I intend to spend a few more weeks in perfecting our invention to its utmost capacity, after which we shall place it before the public.—I am, yours, &c

Montagu Barstow.

2, Phillimore-terrace, Kensington, W., June 17, 1901.

[We append the paragraph containing the "sarcastic comments" referred to by Mr. Barstow. "Another Richmond in the Field.—With the title of 'An International Race for the First Invention,' the 'Daily Mail,' of May 25 printed the following announcement. How many more times will the daily newspapers be made the vehicles for this sort of thing? 'Mr. Montague Barstow, of London, is keenly interested in the report published in the "Daily Mail" of an invention on the part of M. Gurtner, of Berne, of a process of photography in natural colours, for he has one in a forward state himself. He thinks it unlikely that two entirely different processes would be invented at the same time, and he is most anxious to be out first, so as to get all the credit. Mr. Barstow told a "Daily Mail" representa-

tive yesterday that he was collaborating in this business with a French artist, who was the actual inventor. Their process was a purely photographic one, inasmuch as it depended upon the effect of light on different chemical substances. It had quite passed the theoretical stage, and a good print had been produced fifteen months ago. The results obtained are, as far as can be judged, permanent, and are of an exceedingly delicate and beautiful character, resembling as much as anything pale water-colour drawings, the colours being true to nature. All colours are secured, the reds and greens being exceptionally brilliant." If Mr. Barstow will favour us with a call and show us the specimen in question we shall be pleased to examine it. We have no desire to treat him or any other inventor unjustly or unfairly; but the nonsense that has appeared in the lay press for so many years impels us to regard each fresh announcement that the long-sought process of photography in natural colours has been discovered with considerable scepticism.—EDS. *B.J.P.*]

A CORRECTION.

To the EDITORS.

GENTLEMEN,—It might be inferred from your report last week of the meeting of the London and Provincial Photographic Association that I had recommended the use of Watkins' exposure meter. I shall be obliged if you will correct this. The instrument to which I referred was Hurter and Driffield's actinograph.—I am, yours, &c.,

88, Evering-road, June 17, 1901. P. EVERITT.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

R. A. B.—(1) We should say that it would be a very good developer, but we have not used precisely the same proportions as those given in your formula. But we should think the developer would work very well. There is, of course, great latitude in developer formulæ. (2) Here, again, great latitude is allowable. We prefer to use the formaline, when it is necessary to use it, after developing.

TRANSPARENT FLEXIBLE SUBSTANCE.—"FLEXIBLE SUPPORT" writes: "Can you kindly inform me where I can obtain a thin paper-like substance that is quite transparent, like celluloid, only more flexible and transparent? I have seen some about but cannot find where it is sold." In reply: Possibly what you have seen is a thin film of gelatine, if it is not a paper rendered transparent with wax, varnish, or similar substance. If you send us a small sample to see we may possibly help you.

ADDRESS WANTED.—E. B. and SON write: "Can you tell us the address of the 'Keratol' Leather Company, late of 11 and 12, Foster-lane, London, E.C., or of makers of a similar material for camera covering? We have written to above address but letter returned marked gone away."—In reply: We regret we do not know the present address of the firm. Indeed, we do not know what the "Keratol leather" is. But various imitation leathers are supplied by all dealers in bookbinders' materials, some of which are suitable for covering cameras with.

THE PRICE OF SILVER.—MESSRS. BLUNDELL AND SONS, of 199, Wardour-street, write: "In your issue of June 14, in Answers to Correspondents (vide 'Residues,' G. Wood, page 384), you state the market price of standard silver to be two shillings and sevenpence halfpenny. Is this not an error for twenty-seven and a half pence? Price to-day is twenty-seven and seven-sixteenths pence."—In reply: It was a slip of the pen, and we thank Messrs. Blundell and Sons for calling attention to it. Silver is, of course, always quoted at *pence* per ounce whatever its price.

COPYRIGHT.—W. S. ROSS writes: "I photographed presentation bowl by permission of presentation committee, and copyrighted the photograph. A newspaper, which has a large circulation in the district, has reproduced my photograph. Can I charge 10s. 6d. for their doing so? and as that paper has three different issues—daily, evening, and weekly—if picture is reproduced in all issues, can I charge 10s. 6d. for each issue?"—In reply: If you hold the copyright of the photograph you can charge what you like. You can proceed for damages, or for penalties. If the latter, you will receive a penalty for every copy of the paper printed. Put the matter in the hands of a solicitor versed in copyright law at once, and you should recover a very substantial sum.

ACTINIC VALUE OF VARIOUS LIGHTS.—"HIGHBURY" asks for "Compara actinic value of Welsbach light; the blow-through limelight, and blow-through jet with one of magnesia limes, instead of one of usual limes?"—In reply: No actual data can be given beca blow-through jets vary so very considerably in the powre of light they yield, whether with a lime or magnesia cylinder. Ag with the Welsbach light, that varies very much according to state of the mantle. After it has been in use for a time the li it emits is much less than it was when new.

A SITUATION REQUIRED.—"UNO" writes: "Could you kindly advise what to do in my case? I have been obliged to leave South Africa account of the war, I have had studios of my own there and h also been manager. I served my apprenticeship with one of leading West-end firms here in London, but have been away fr England eighteen years, and now I am in want of a situation, have no references, only friends here."—In reply: We can o suggest an advertisement in our outer columns. If your work good and you have specimens of it you should find no difficulty procuring a situation.

ELECTRIC LIGHT IN PHOTOGRAPHY.—D. G. THOMAS writes: "(1) I want know what kind of arc lamp is best for photographing in studi what kind is in general use in London? (2) What candle power wo you recommend for general use for taking groups, children, a full-length cabinets, and larger size?"—In reply: (1) Two kinds in use, those with automatic feed, and those with "hand fee The latter are far less expensive than the former. (2) From to ten thousand candle power, because for taking groups the lig must be placed at a greater distance than when taking busts three-quarter length portraits—for those less c.p. will suffice.

A SHOWCASE DIFFICULTY.—BATEMAN BROS. write: "Some three wee ago we applied to the Council for permission to erect a studio, a being a private house, we took it for granted that it would inclu a showcase in the forecourt thereof. The 'case' in question about five feet long, and about five feet high by two feet dee permission for which we have had from the landlord. On Tuesd last a representative from the council called and told us we shou have to take it down. Can they compel us to do so, whilst allowi others in the same district to stand; and, is there any socie which we could join, which would take the matter in hand? As y will see, this not only affects this district, but every one whe photographers have showcases in the forecourts of their houses." In reply: Probably the Council look upon the showcase as 'structure,' which is against their bye-laws, and cannot be allow without their consent. Possibly with a slight alteration they will gi their consent. There is no society that would take such a matter hand.

A QUESTION OF QUALITY.—"ENLARGEMENTS" writes: "I sent for tw bromides, 20 by 16, from whole-plate negative of 'Return Home Local Volunteers,' and asked to have them returned in two day as the order was given on the understanding that I should ha them ready for a customer who intended to make them present on the occasion of the banquet given to the me Well, they came back, but all out of focus on one half of t picture. I returned, and said they were useless like that, and tw others were sent, which were all right, but no good to me as th were too late for what they were intended for, so I not only lost t sale of them (framed complete), but offended my customer into t bargain. I wrote explaining all this, and asked if they would me other enlargements to the value paid for them that we useless, but they refuse. What is usual, or what do you think fair in a matter of this sort? I omitted to say, they wrote a lett saying they were sorry they had been sent out—out of focus, b having had to do them in so short a time, blamed it off on to tha although charged in invoice extra on urgent order."—In reply: T only thing we can suggest is that the two enlargements should returned—they should have been sent back at the time—and then s for the money paid for them in the county court.

VARIOUS QUERIES.—F. E. J. writes: (1) I have a half-plate camera wi an R. R. lens of about eight-inch focus, with which I can only tak cabinet portrait vignettes, as I cannot quite get back far enoug for cabinet three-quarter length figures; the total distance I can g back is nine feet, and at that distance the lens throws much to big a figure for cabinet three-quarter length. Please say by wha method I can obtain the proper size cabinet, three-quarter lengt also c.-d.-v. three-quarter length, and midget vignettes? (2) Pleas give a formula for a good concentrated, single solution, ortol de veloper for plates and papers, and how to control under-exposur and over-exposure with same? (3) Please also give formulæ for good reliable intensifier for portrait negatives. I have tried t obtain bichloride of mercury, but cannot do so on account of it poisonous nature?"—In reply: (1) If you cannot get back furthe than nine feet you will not be able to do what you want with lens of eight-inches focus. The only thing to be done is to use shorter focus lens, and put up with somewhat violent perspective (2) Two formulæ are given on page 1014 of the ALMANAC, one wit soda, and the other with potash. If you want more concentrate solutions than these omit some of the water and dilute as required For under-exposure use less bromide, and for over-exposure increas the proportions. (3) No special intensifier is necessary for portrai negatives. What answers for landscapes will do equally as wel for portraits. On page 1068 of the ALMANAC three formulæ are give for intensifiers that do not contain mercury. You should, however have no difficulty in getting the bichloride, but you must go to a pharmaceutical chemist for it.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 2147. Vol. XLVIII.—JUNE 28, 1901.

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EX CATHEDRÂ.

Pernicious of Bichro-of Potash.

The letter from a correspondent, in our last issue, on the subject of blood poisoning by bichromate of potash as used in printing is of interest to all who employ that salt in daily avocations. It is of special interest from the fact the effects described differ considerably from those have been previously narrated, so much so, indeed, that g by what has been published before by eminent medi-thorities, one is almost inclined to doubt if the trouble ly due to the bichromate. That the sufferer is suffer-m blood poisoning there is no question. But is that bichromate of potash, or may it not be attributed to causes? We raise this question because the effects ed do not coincide with any others that have come our notice, or with those of several whom we have to have suffered from the ill-effects of the salt. minent medical authority, the late Dr. B. W. Richard-voted a great deal of attention to the subject of poi-from substances used in different trades, and went very deeply into the effects of bichromate of potash, both as experienced in the works in which it is manufactured and by those who use it in carbon printing. In the early eighties he read a paper before the Medical Society and, in the "Asclepiad," for October, 1884, he also has an article on the subject with photographs, coloured, of hands showing the effects of the bichromate on the skin of the sufferer. In this article he gives the history of several cases that had come under his observation and which he terms the disease from "bichromate of potassa," and describes the symptoms, which were very similar to those we had described on previous occasions in the JOURNAL. The first symptom is an irritation on the backs of the fingers, with minute pustules which, if scratched, emit a watery fluid. As the disease extends, the backs of the hands and the wrists become affected in the same way, and the irritation becomes more acute, particularly when in bed, or when the body gets heated. Dr. Richardson says that one of the cases that came before him "was so singularly true to 'pityriasis rubra' that I should have entered it in my note book as a good example of that disease in its subacute stage. At the same time, there was in the palmar region an appearance very like 'psoriasis.'" This case was very typical of others that came under his observation. If the work with the bichromate was discontinued the skin dried up and exfoliated and came away in bran-like scales. In all instances it is mentioned that the disease was almost, if not entirely, local, and did not extend beyond the part that came in actual contact with the solutions—the hands, wrists, and forearms. From this it would seem that the case quoted by our correspondent is not in accord with those referred to by Dr. Richardson, hence the suggestion that the blood poisoning—and there is no doubt that the case is one of blood poisoning—may, possibly, not be due to the bichromate of potash. As to the treatment and cure of the bichromate disease, the late doctor says: "In the cases I have seen I very much doubt whether any treatment was of much avail. It seemed to me that recovery commenced when the cause of the evil was withdrawn, and Nature followed her own course." He, however, adds that the use of a solution of sub-acetate of lead acts well in relieving the local irritation, and, perhaps, in arresting the discharge. As the

carbon process, and processes dependent upon the employment of bichromate of potash, are now so largely used the ill-effect of the salt on the workers becomes an important question. Therefore we shall be glad to have the experience of any of our readers who have experienced inconvenience from its use, together with the symptoms in their cases.

* * *

Uncertain Processes. One frequently reads, or hears, that this or that process is very uncertain, or is too uncertain to be of practical value. In these cases, is not the term uncertain a misnomer? Should not the uncertainty rather be attributed to lack of knowledge, or skill, on the part of the worker? Supposing a process with which a worker — maybe its inventor — gets one good result and nine failures, is that process to be held at fault? We should say not, for had precisely the same manipulations, and conditions of working, been carried out, all the results would have been alike. In the early days of many processes they were classed as uncertain ones, yet they are now worked daily with the greatest certainty. When gelatine plates were first introduced, and before they became articles of commerce, many will remember the difficulty they experienced in making two batches of plates alike, and the process was, at that period, classed by not a few as an uncertain one, yet we see what it has become in experienced hands. Here is another example: the powder process, that is still looked upon by many as an uncertain process, and so it is until the principles involved in its working are understood and mastered. The success, or failure, in working the powder process depends entirely upon hygroscopic conditions, and they are very varying in this fickle climate of ours, but that does not make the process itself an uncertain one. The hygroscopic conditions as they exist at the time, must be taken into consideration and dealt with as circumstances demand, then the process ceases to be an uncertain one. We make these comments because we so frequently hear certain processes described as being uncertain, the synonym of which is lack of knowledge of the principles involved, or care on the part of the worker.

* * *

Natural Backgrounds for Portraiture. Photographers at seaside and holiday resorts are just now looking forward to their harvest time, and some are doubtless wishful for novelties wherewith to attract customers. Many persons would, no doubt, appreciate having their portraits, when taken while on a visit from home, associated with some point, or points, of interest in the locality in which they are taken—some "fairy glen," old ruin, or other local interesting subject. We are quite aware that some enterprising portraitists do possess painted backgrounds, that represent, more or less—less rather than more—interesting scenes of such local subjects, but that is not the rule. There is no reason whatever why natural backgrounds of the subjects should not be introduced by double printing from negatives taken of the places themselves. That can be easily done and the picture would command a considerably higher price than the "usual thing." The thing is very simple if the method, first published by Mr. Edge many years ago, be followed. At the time that it was published that gentleman did a very good business with portraits with backgrounds from nature. Briefly, the method, which is simplicity itself, is this: The portrait is taken in the studio in the ordinary way with a very light plain background. The prints a then made on albumen paper, when, of course, the figu appears with a nearly white background. Next the figu is painted over with a non-actinic water-colour—gamboge w the one employed by Mr. Edge, if we remember right This requires no actual skill to do, and it can be quick done by any girl. Then the landscape, or other subject neg tive from nature, of a suitable size, is taken, and light printed on the portrait print already made—the pigme of course protecting the already printed image. The pri is then washed and toned in the ordinary way. In t washing out of the free silver the gamboge comes away i the water, leaving the paper quite free from the colour th protected the portrait in the second printing. In th method of working it will be seen that there is no troub in registration, as there is in the usual methods of doub printing. The slight tint yielded when a very light bac ground is used for the portrait serves to give atmosphere the landscape, and greatly enhances the effect artisticall It goes without saying that the lighting of the sitter mu be in accordance with that of the landscape negative use This reminder of Mr. Edge's method may be of service some just at the present time.

* * *

Recent Radiation Work. For some time past our readers may r member we have been able to brin before them the remarkable results obtained, more especiall by M. and Mdme. Curie, in investigating the radiatio afforded by uranium and other metals. One result was th discovery of a new element which has been termed Radiu on account of its properties. More recently they have di covered that certain substances exposed to the radiatio from radium become, in turn, radiferous, and capable acting upon a photographic plate, through many substanc opaque to Röntgen rays. This induced radiation does n exist merely simultaneously with the exposure to the origin radiferous salt, it continues for some time; after remov the induced body loses part of its power rather quickl and then at a slower rate. The chief question that presen itself with regard to these remarkable effects is what is t radiation that can be conveyed to other bodies? Is it merel property like colour or specific gravity, or is it in emanati —an actual substance? The Curies, with M. Debierne, h that the facts at present known are not sufficient to fou a theory upon. Professor Rutherford, of the McGill Univ sity, Montreal, believes his experiments go to indicate direct answer to the query. In a recent letter to "Nature he describes his latest work upon the subject, and points o that nearly eighteen months ago he published in the "Phi sophical Magazine" the fact that he had discovered th thorium compounds continuously emitted radio-active par cles of some kind, which preserved their activity for sever minutes, and which possessed the remarkable property causing all bodies in contact with them to becor themselves radio-active. He was thus able to ma even fine platinum wire a powerful radiator. Wi a specimen of radium he found that at ordinary tempe tures the amount of radiation was small, wh if the temperature was slightly raised the radiation w enormously increased to the extent, indeed, of ten thousar fold. Up to this he had obtained no definite evidence to whether the so-called emanations were vapours of t radio-active substance, radio-active gases, or radiating p

es, large compared with a molecule. Quite recently, how-
r, he states that he examined the effects by an electrical
thod; not to weary our readers by a description of the
in of experiments, we may state the conclusions arrived at
Professor Rutherford's own words—"We must, therefore,
clude that the radiation is, in reality, a heavy radio-
ive vapour or gas."

* * *

**lew Phono-
ph Actuated
Photography.** Descriptions of two new phonographs have recently been published, one of them, Ruhmer's, being based
ly upon photographic aid. According to "Nature,"
information at present to hand is scanty, and
briefly, as follows. Herr Ruhmer photographs
a moving film a sensitive flame which is being affected
sound vibrations, and thus obtains on the film a band of
ying intensity; light is then projected through this band
to a selenium cell, which is included in circuit with a
tery and telephone. The variations in intensity as the
n is passed before the source of light cause variations in
rent in the telephone circuit, which reproduce the original
nds. The reproduction, it is said, is clearer than in the
er, the Paulsen Phonograph, and as an additional advan-
e, the records can be multiplied to any extent by photo-
phic means.

* * *

ia Glass. At a recent meeting of the Physical Society a description of these glasses
the principles underlying their application to
ical purposes was given by the Chairman, Professor
P. Thompson. He pointed out that the intro-
tion of barium increases the deviation, but leaves the
persion unaltered. It is possible now to get crown glass
h a higher refractive index than flint glass, and this
kes it possible to construct an achromatic lens which will
possess a flat field. It is usual in making achromatic
ectives, to make them accurately achromatic for the red
violet rays. A better approximation, the chairman said,
be obtained by having the approximate achromatism
oughout the length of the spectrum. This is obtained by
ching the irrationality of one glass by means of another,
then constructing an achromatic pair out of these glasses.

A PLEA FOR COLLODIO-CHLORIDE PAPER.

PRISE has often been expressed that considering the great
antage of collodio-chloride paper as a printing medium
reason of the permanency it affords, this class of paper
ot more generally adopted by the great body of amateur
kers throughout the length and breadth of the land.
doubt much misconception exists among such workers
arding this class of printing material. Strange to say
e of the modern school of workers have an idea that
odio-chloride printing paper is a new product, like so
ny others of the papers so well advertised by manufac-
ers and dealers, and possibly because they do not consider
ood form to go butterflying after every new importation
matters photographic, they stick to their packet of P.O.P.
other material without giving a thought to the great
ue of the paper they are discarding. Others, again, are
nd who have tried this paper, and by reason of the diffi-
ty experienced in the working of it have set it aside once for all as quite unsuitable for amateur working. These are doubtless the two most common objections to the adoption of this material by amateurs generally. With regard to the first, it is only ignorance of the history of the introduction of this paper that can account for such an objection. Collodio-chloride dates back from about 1870 to 1871, and even at that early date there were those who saw the undoubted advantage which it conferred by reason of its permanency, and have stuck firmly to it ever since, even although at that early date the samples in use had to be derived from the Continent, our home manufacturers not having given their attention to its production. This question of permanency alone (for collodion, unlike albumen and gelatine, does not form a compound with the silver) is sufficient to warrant its adoption in preference to other varieties of printing papers, and many of our very best portrait photographers have been compelled to discard other printing material, and adopt collodio-chloride from this one reason alone; although there are very many other advantages, such as its adaptability to almost any class of negative, the variety of toning baths available, with the wide range of tones capable of being produced by such.

Within recent years this excellent class of printing material has been manufactured both at home and abroad to a much greater extent than formerly; for professional workers, whose sheet anchor is permanency, have slowly but surely been driven to adopt it, and it must only be a matter of time before the great majority of amateur workers will follow their example.

On the other hand, it must be confessed that any one unaccustomed to the use of collodio-chloride, or who has never seen a printer who understands its working manipulating the paper in the operations of toning and fixing, is very liable indeed to lose heart at what he may deem the insuperable difficulty of working this paper. One of the chief stumbling-blocks in its use, no doubt, lies in the proneness of the paper to curl up into little tubes, when subjected to the washing-bath. In this, however, like so many other things connected with photography, a novice should bear in mind that if a special material has to be successfully employed, one of the first things to do is to discard a method of working suitable to some other process, and which somehow or other they have come to look upon as being adaptable to every form of printing material.

With collodio-chloride the ordinary treatment of such printing papers as gelatino-chloride or albumen will not succeed, but when subjected to a special method of working a little practice will enable any one to overcome difficulties which, at first sight, may have been deemed insuperable.

In the treatment of a batch of prints on collodio-chloride paper, one of the first and most important operations is that of flattening, and it is just here that the great secret of success in working this paper lies; the operation, however, is simplicity itself. A large and clean porcelain tray should be selected and not too much water placed in the same; the prints are then taken in hand and placed face downwards, one at a time, and one on the top of the other, but not in a regular pile, which would permit of their edges curling over each other; they should be spread over the entire bottom of the porcelain dish; by this means, the edges of the lower prints having other prints superimposed on this part of them, they are prevented from curling; by the time the last print is inserted nearly all the water will or should have been

absorbed by the paper backing of the prints; they are then pressed flat down with the palm of the hand, and by inclining the dish all the water is drained off, and in five or ten minutes' time the prints will become nice and flat. When this stage has been reached all difficulty will have been overcome, and then plenty of water may be placed in the dish to thoroughly wash the prints without curling.

The temperature of the water requires consideration also. In summer the natural temperature will be just about right, but in very cold weather the water should be slightly warmed, and three or four changes ought to be used in washing previous to toning.

After the prints have been flattened as above described, care should be taken not to unduly handle them when washing, but after being washed they are placed separately one by one into another dish of clean cold water whilst waiting to be toned.

Some of the most beautiful results ever obtained in photography have been derived by using matt surface paper of this description, and toning the same first with gold and then with platinum, which yields a rich black colour; or by using gold alone, any colour from sepia to a rich purple can be obtained. Precautions, however, should be taken to print in accordance with the requirements of the particular method of toning it is intended to adopt.

With a sample of matt paper it will be found the tendency to curl is not so great as with the enamel quality, but the precautions stated ought not to be overlooked, and where platinum is the toning agent to be employed, the prints should be very dark until the shadows are even bronzed. Where both gold and platinum are to be employed the depth of toning in the first bath depends on the colour wanted in the finished print. If merely a warm black is desired, the print should be only slightly toned in the gold bath, whilst for the blue-black the toning in the first or gold bath should be carried further. After being subjected to the gold toning bath, the prints ought to be well washed in at least two changes of water, when they may be inserted into the second or platinum bath, until they assume a rich black tone, and to ensure pure whites they must be very thoroughly washed in several changes of water before being placed in the fixing bath, which must be freshly made in all cases where platinum toning is employed.

As to the best formulæ for toning, mention may be made of that recommended by Dr. Eder, from whose experiments in the treatment of this paper much of the above has been adopted.

To many it might seem that the time required for washing prints on matt paper is unduly long when compared with the treatment of glossy surfaced papers, but when it is borne in mind that with all matt surface printing papers, the emulsion is sunk into the paper, it will be seen that a more thorough method of washing should be resorted to in every case where a matt surface is employed.

It goes without saying, that any one who makes up his mind to adopt collodio-chloride as a printing process, must study closely the requirements of this class of paper, and should not discard an undoubtedly permanent process because a few failures or breakdowns should happen to arise. There are defects in all printing papers and mediums, but when properly understood collodio-chloride is as free from them as any. Quite recently a well-known amateur worker when discussing this subject in our presence stated his chief objection to the use of the paper was the difficulty of getting the prints to lie flat, and their liability to show stains in the course of toning. It is well known that, in the working of collodio-chloride, such stains may arise from other causes than the washing prior to flattening, but it is also well known that when those defects are met with a slight application of alcohol or methylated spirits to the stained parts during the operation of toning will overcome the defect, after which it will be found that reinsertion of the prints in the toning bath will remove the stains.

To expert workers there are numerous other dodges in connexion with the treatment of this class of paper, among which may be mentioned the retoning of prints after they are finished, this is useful where it is found a print is somewhat undertoned, and is accomplished by subjecting the print to a bath of methylated spirit prior to replacing it in the toning bath.

Collodio-chloride has stood the test of time as one of the few permanent printing processes in photography, and it is to be regretted that, notwithstanding the extra labour and precautions required in its manipulation, it is not more generally used.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

We again remind the members of the newly formed Professional Photographers' Association that the first General Meeting of the Association will take place on Tuesday evening next, July 2, at 8 o'clock, at the rooms of the Royal Photographic Society, 66, Russell-square, London, W.C.

The following notice of the meeting has been sent to every member of the Association:—

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The First General Meeting of the Association will be held at

THE ROYAL PHOTOGRAPHIC SOCIETY'S ROOMS,
66, RUSSELL-SQUARE, W.C.,

on Tuesday, July 2, 1901, at 8 o'clock, when your attendance is requested.

BUSINESS:

To receive the Report of the Provisional Committee, and to elect the Committee for the ensuing year.

So recently as last week we dwelt upon the special importance of the work that has to be done on Tuesday next, viz., the election of the Executive for the ensuing year. It is to be hoped, therefore, that every member who can possibly attend will make a point of doing so, and thus seize the opportunity of having a voice in the selection of the men who are to take charge of the destinies of the Association at the outset of its career. Even at the risk of wearying those interested in the new Association by the reiteration of our views on this point, we feel bound once more to urge upon members the prime necessity of performing this cardinal duty. We look to Tuesday evening's meeting to provide a strong Committee of London and country photographers whose names shall be a guarantee to the whole profession that the business of the Association has been placed in capable and responsible hands.

FOURTH LIST OF MEMBERS OF THE ASSOCIATION.

The fourth list of Members of the Association has been handed to us by the Honorary Secretary:—

Arthur, Thomas William, 45A, George-street, Hastings.
Bond, H. J., Photographer, 93, Stoke-road, Gosport.
Bell, John, 176, Main-street, Barrhead, Renfrewshire.
Bennett, Thomas (John T. Bennett & Sons), 8, Broad-street, Worcester.
Bourke, Annie (T. Bourke), 213, South-street, Perth.

Brooks, Warwick, 350, Oxford-road, Manchester.
Buckley, Joseph, Church-street Studio, Heywood, Lancs.
Busybox, Samuel, Westgate Studio, 56, Westgate, Peterborough.
Boucas, George, The British Studio, 120, Mile End-road, E.
Clark, Alfred, Photographer, 60, Queen's-road, Watford.
Cornhill, Frederick, and Maria Mona Cornhill (Duyshart Co.), 75, Duke-street, Chelmsford.
Coghlan, Frank, 31, Carlisle-road, Londonderry.
Davies, Joseph Bennett, The Studio, 36, Heath-street, Birmingham.
Duncan, William Harper, City Studio, Midland-street, Hull.
Eddy, David John, 41, Norman-road, St. Leonards-on-Sea.
Edwards, Charles, Mount Pleasant, Fishguard, R.S.O. Pembrokeshire.
Forde, T. Fitzgibbon, 15, Waterloo-place, Sunderland.
Godbold, Henry James, 38, White Rock-place, Hastings.
Hudson, Mr. (Hudson & Co.), 9, 10, 48, 49, 50, and 51, Great Western Arcade, Birmingham.
Houghton, J., Artist and Photographer, The Carlton Studio, 82, Albion-street, Leeds.
Horne, Israel, Photographer, 148, Station-road, Pendlebury, near Manchester.
Hargrave, William, 82, Preston-street, Faversham, Kent.
Hughes, John (John Cartwright Hughes), 65, Britannia-road, Fulham, S.W.
Jones, William Rhys, 36, Cowbridge-road, Canton, Cardiff.
Jowett, Richard Keeble, Napleton House Studio, Warren-street, Tenby.
Jenkins, Wilfred L., Photographer, 116, Cromwell-road, South Kensington.
Marshall, Charles, Photographer, 21, Cambridge-road, Hammersmith.
Moxon, Thomas, 8 and 9, Castle-street, Hay.
Morrison, Harry Alexander (Mowll & Morrison), 45, Hardman-street, Liverpool.
Metcalfe, Mark (Jordan & Metcalfe), 16, George-street, St. Helens.
Milnes, John Pollard (J. P. Milnes), 64, Hanover-street, Stranraer, N.B.
Noble, Mr. (Noble & Son), 91, Quarry-street, Hamilton, N.B.
Pearlmann, Maurice, Photographer, St. George's Cross & 49, Jamaica-street, Glasgow.
Price, Thomas, sen. (T. Price & Son), 2 and 4, Peter-street, Jersey.
Price, Thomas, jun. (T. Price & Son), 2 and 4, Peter-street, Jersey.
Robinson, William Holding, Photographer, 606, Barking-road, West Ham, E.
Rose, Mr. (Rose & Coop), 135, Regent-street, W.
Stanley, Albert Edward, 9, East-street, Bedminster, Bristol.
Seaman, Alfred (A. Seaman & Sons), High-street, Chesterfield.
Snowdon, Thomas Garner, Photographer, Field-street House Studio, Kettering.
Stocks, W. J. W., High-street, Uppingham.
Stuart, Charles, 47 and 49, Brompton-road, S.W.
Timothy, Stephen, 186, Ystrad-road, Pentre, R.S.O., Glamorganshire.
Vrate, Alfred, Meadows Studio, 147, Kirkwhite-street, Nottingham.
Wright, Miss Margaret, The Studio, 75, Albert-road, Middlesbrough.
Wood, Ernest, Raleigh Studio, 88, Brixton-hill, S.W.
Webber, Frank, Southern Counties Photographic and Art Studios, 27, Potters-lane, Basingstoke.
Wilkinson, John, 114, Front-street, Chester-le-Street, co. Durham.

The foregoing list takes the Association well into the fourth hundred of its paid membership—all things considered, a result that amply justifies feelings of lively satisfaction. It has to be remembered that the tempest caused by what was termed the 'Ogden-Lever' invasion had quite subsided before the real work of forming the Association was taken in hand, and the fine list of 350 paid members is really the outcome of a movement made in times of peace, when no vexed question was agitating the profession. But at any moment the need of a defensive body, such as presumably the Association intends to be, may manifest itself, and then the ready opportunity of taking concerted action on behalf of professional photography and its interests will at last be available. If the subjoined condensation of the Rules be carefully studied it will be seen that the Association proposes to invest itself with far-reaching powers, and it has only to be realised that their underlying aim is the advancement of the photographic profession, to ensure the present membership being trebled, if not quadrupled, a result that no doubt will be reached in due course.

The objects of the Association shall be :—

(*a*) To promote the interests of its members in their professional work.

(*b*) To watch Parliamentary or public action affecting the interests of photographers.

(*c*) To deal with matters affecting professional custom and practice.

(*d*) To co-operate with similar Associations for the purpose of securing united action and mutual support in dealing with matters affecting the profession.

Membership shall be restricted to persons engaged in the commercial production of photographs, who shall be either in business on their own account, or in partnership, or responsible managers of firms or companies.

Professional photographers may be admitted to membership on the nomination of a member, or on their own application. The Committee shall decide any question as to eligibility.

The annual subscription shall be 5*s*., payable on admission.

The ordinary meetings of the Association shall be devoted to the discussion of matters concerning the welfare of professional photographers and the profession only. They shall be held on the first Fridays in February, April, June, October, and December. The Committee may call extraordinary meetings when they may think it advisable.

The Committee may make such bye-laws and regulations, not inconsistent with the rules, as they may from time to time think necessary. They shall also have power to appoint sub-committees from the members of the Association.

If ten members shall sign a report to the effect that they consider it desirable that the membership of any member shall be terminated on account of conduct either tending to bring discredit on the profession or obnoxious to his fellow-members, the Committee on receipt thereof shall call a special general meeting to discuss the matter; then, if two-thirds of those present shall so decide, the offending member shall be expelled.

The payment of a subscription by a member shall be taken as indicating acquiescence in the rules.

Meanwhile, satisfactory as the progress of the Association has been so far, we again subjoin the membership application for the use of our professional readers :—

To the Honorary Secretary,
Professional Photographers' Association,
51, *Baker-street, London, W.*

Please add my name to the list of members of the Professional Photographers' Association. I enclose the amount of my first year's subscription, 5*s*.

*Signature*_____

_____1901.

Please fill in the following particulars for Members' List :—

Full Christian and Surname _____

Full title of Firm or Company _____

Full Address_____

ON THINGS IN GENERAL.

One great attraction of The British Journal of Photography is the free way in which the correspondence columns are open to every one who has anything to say; indeed, they are open to those who have nothing to say provided they say it in a clever manner. Belonging decidedly to the former category, two letters

have appeared which will afford food for all thinking photographers —a letter by Mr. Coventry on photographic optics, and one by Mr. Wheeler on diffraction with small stops. The latter being on a question of practice may be considered first. Mr. Coventry's point is that the limit of size of aperture in relation to focal length usually has a minimum given to it of unnecessarily restricted proportions, *f*-70 was the minimum he set out to prove incorrect.

There are few lenses on the market provided with "stops" of smaller proportion than this; hence the occasions when still smaller diaphragms can be tried occur but rarely in practice with the average photographer. But it is within the power of most workers with the camera to show that Mr. Coventry is quite right. There are many lenses in use which can be taken to pieces and one half of the lens only used, the focus of the half lens being about double that of the whole combination, so that if the smallest stop with the complete lens be *f*-64, the same stop used with half the lens would be *f*-128. There must be plenty of photographers who have so used their lenses and equally certain is it that with *f*-128 they will have obtained pictures of the utmost sharpness. I have a series of portable symmetrical lenses from four-inches focus upwards, and have used each of them, halved and with the smallest diaphragm, and never once discovered any lack of sharpness. A hint upon this use may here be given. It is advisable to have an extra tube to screw into the lens tube for the purpose of lengthening it so as to remove the diaphragm a little further from the lens. This will obviate flare, which might under some circumstances make its appearance with the lens at a particular distance from the diaphragm.

The next thoughtful letter, by Mr. Coventry, touches a subject of perennial discussion—depth of focus. Now I should like to ask Mr. Coventry where there is to be found in the work of any great writer on photographic optics the expression he uses, "depth of field," thus making "confusion worse confounded." This writer very complacently accuses the late Mr. Dallmeyer of error, and, having the courage of his convictions, gives examples showing the magnitude of that error. My very strong advice to any one inclined to be led by Mr. Coventry's really clever argument is to leave severely alone the proposed new term, which appears to be founded on a misconception. The letter in question treats only of the back focus of a lens, and entirely disregards conjugate foci. The "depth of field" refers presumably to front focus, and if there were any fear of misconstruing any dicta on the subject, "front focus" might be used. When Mr. Dallmeyer objected to the term "depth of focus," he referred to mathematical depth, and transferred the term, as is usually done, to the results of photographing as shown on the plate. Microscopists speak of the penetration of a lens; no one imagines them to infer that the lens penetrates the object. Similarly when the term depth of focus is used, no one supposed the plate to have hillocks of silver differing in height according to the locale of the focus. My own opinion is that no plan could be better than that adopted by Mr. Thomas Dallmeyer in his work on Tele-photography, where he gives a number of working formulæ for lenses under varying conditions of diameter, aperture, and focus. He simply uses the term "depth," and speaks of "front depth" and "back depth." Every one knows what is meant, and the term is just as descriptive and legitimate as that of "penetration" in the microscopist's mouth.

It is not a far cry from lenses, through cameras, to films; and as every reader of photographic and, indeed, of journalistic literature generally, is aware, there has been plenty of cry about the latter for some time. The whole matter can be put in a nutshell. The new rule of the Kodak Company involves a very large question. The Kodak people deserve well of all photographers, or perhaps we should say dealers, for the truly remarkable improvements in apparatus and materials they have been the means of bringing out, and they naturally desire to get all the commercial benefit attaching to such improvements.

If all the world would act on the proverb, "There are two sides to every question," much of this sort of friction would be avoided. In the usual manner of people generally, Kodak only looked at their side of the question and did not take into account the possibility of others seeing another side. Hence they simply printed on their invoices—certainly not in a way to call attention to it—the now celebrated conditions. Seeing, as they must have done, the far-reaching character of the conditions, if they had only sent circulars to leading dealers pointing out their intentions and inviting any comment, all opposition would have been disarmed, and an amicable result would quickly have been brought about. As it is there is a feeling among dealers that the conditions have been sprung upon them, and every one is up in arms against them, and the feeling is engendered that this is the beginning of an organized attempt at coercion—all for want of a little diplomacy.

Mr. Eastman is a hard fighter; but, then, Britishers also are stiff fighters, and as history shows will fight to a finish even if there is only a shadow to gain, once their pugnacity is aroused.

It is singular that two instances of *casus belli* should have occurred in such close proximity of time, and have led to the founding of two Associations almost simultaneously, one to protect the interests of dealers, and the other that of professionals. Success to both! The original *casus* with regard to the profession will, I think, as I have before indicated, die a natural death; but a strong body has been brought together, and it will go hard if they do not benefit the profession generally. It is a question whether the action of one may not come into opposition with the work of the other. Naturally, professional photographers would like to buy the goods they use in the cheapest market; equally naturally, the dealers will feel they ought to have a finger in the pie. I do not know of any business in the world beside the photographic where large buyers who are large users have to pay a fancy price for the goods required in their business in the interests of dealers who mostly buy about one-tenth part of the quantity purchased by the large users. Yet this is what happens with plates and papers, and here is the possibility of opposing interests. Let me advise photographers again for their own benefit to go in for dealing. Professional photography nowadays is a very different thing from what it used to be; for one man making a good income out of it, there are scores of good men merely existing on its business results; yet, by taking up dealing, they could, without loss of self-respect, and to the great enhancement of their income, show a very different balance-sheet. There are many makers who will supply bona-fide dealers at trade prices, without asking whether any portion of the plates are to be used by the dealer for the purpose of his own portrait or landscape business. By-the-by, when a dealer starts taking photographs in opposition to a professional photographer who does not "deal," no difficulty is put in the dealer's way by the Association, no matter how he may cut prices of photographs.

A lurid light is already being thrown on the probability of my vaticinations regarding foreign competition, for there are now to be seen advertisements from a Continental company announcing the preparations they are making to put their plates on the English market. We shall perhaps be told that it does not matter, for as many plates can be sold now as can be made. But how about this company—with works extensive enough to swallow all the London makers—in the course of a few years' time? Most of the plate manufacturers already find it necessary to send out travellers to solicit orders. What will they have to do in a few years, when they have raised up more enemies than ever among their real customers, the professional photographers? "Delenda est Carthago" will be the latter's motto, and justly.

It is a fortunate thing that the Convention is so near at hand. This pleasant annual gathering is a kind of neutral meeting-ground for all sorts of conflicting interests. Oxford, a delightful place, is this year well chosen. The warring elements which have recently appeared in photography could not possibly have a more suitable camp of peace than the old University City. Kodakites, anti-Kodakites, plate-makers and their critics, Salonites, *f*-64-ites will no doubt put in an appearance in large numbers and fraternise to their hearts' content. I should like to add my note of congratulation on the "get-up" of the Convention Handbook. But what has become of the annual exhibition of pictorial photographs held at the Convention? The idea seems too good to drop.

I notice two queries replied to in the "Answers" columns. One asks whether a lens for a 15×12 camera will do for cabinet heads, and the editors rightly say, yes, if studio is long enough. But I

should like to say to that inquirer: Are you not going to take cartes, or midgets, or full-length cabinets? If so, a thirty-feet long studio would not be long enough with that lens. Beyond this, unless in an exceptionally favoured locality, a distance of even twenty feet between sitter and lens is often in winter weather fatal to good results, owing to atmospheric haze, which, even in that short distance, may have disastrous effects.

Finally, with regard to the correspondent who finds a syphon washer does not act always, water coming in at the same rate as it goes out, and the tank thus running empty and remaining so, he should know that that is a trick of all syphon washers. There is no certainty that they will act in that theoretically beautifully perfect way which causes them to empty and fill as desired. They may, or they may not, and no power on earth will make all syphon washers always act. FREE LANCE.

TELE-PHOTOGRAPHY.

THE revival of interest in tele-photography induces us to place before our readers the following lucid article from the pen of the late Dr. Adolf Steinheil, of Munich, an able optician to whom photographers are largely indebted for improvements in lenses. The article was sent to Dr. Eder on January 14, 1892, published in the "Photographische Correspondenz," and afterwards embodied in Dr. Eder's "Ausführliches Handbuch der Photographie," Vol. I., part 5:—

If very distant objects have to be photographed under the best possible conditions with regard to brightness of image and extension of field, the direct use of a photographic objective is of course the best, as it involves no loss of light beyond that caused by the lens itself, and the whole field, rendered with satisfactory definition, is at our disposal. The intensity is then determined by the effective aperture, and the size of the different objects by the true focus of the lens.

If we increase the scale of the objective, that is to say, enlarge the aperture and focus in the same proportion, the intensity will remain essentially the same, but the size of the various objects will grow in the same proportion as the aperture and focus.

But if it be of more importance to obtain as large a representation as possible of distant objects, without unduly increasing the length of the apparatus, rather than a large field and rapidity of exposure, it is then advisable to combine one or more lenses with the objective. By such a combination of several lenses a system may be constructed having a longer equivalent focus than the focus of the objective. It will give larger images of very distant objects, because their dimensions are determined by the equivalent focus, instead of the back focus, of the combination.

Such combinations have long been used for the visually active rays, and are called Telescopes. By the study of the various types of telescopes it is easy to see what may be of service for tele-photography. In fact, two alterations must be made in the telescope.

1. The rays of light must be brought to a correct focus not only for the brightest, but also for the violet part of the spectrum, and the latter must have chief attention.

2. The rays which pass through the last glass surface of the telescope must unite and form a real image. They must not be transmitted to form a real image upon the retina, after passing through the eye, as is usually the case with telescopes.

If we examine the various types of telescopes, we find two which are especially useful for the purpose: the Galilean and the Astronomical. These are the most simple and at the same time involve the least loss of light and disturbance from reflections.

The Galilean telescope is formed with an objective of positive and an eye-piece of negative focus, and the inverted image projected upon the retina appears to be upright.

In the Astronomical telescope a second inverted real image is formed in the tube at the focus of the objective, in addition to the image formed upon the retina, which, although upright, is seen inverted through the use of a micrometer eye-piece.[1] Crossed wires may be introduced in the plane of the aerial image formed by the objective, and their magnified image may be photographed at the same time, and often provides a useful check, especially with regard to distortion caused by the eye-piece.

We may disregard terrestrial telescopes, which, in addition to the apparently upright image formed upon the retina, produce two other real images, one inverted and the other upright. The larger number of lenses and the greater length of tube required for inverting the image twice, are disadvantages without any appreciable compensation.

We are thus left with only the two types of construction we have already mentioned, the Galilean telescope and the astronomical telescope with micrometer eye-piece.

In both cases two lenses placed at a distance from each other will suffice, the second lens being of the nature of an eye-piece. In fig. 1 the path of the rays is represented in the case of the construction being a Galilean telescope, and in fig. 2 in the case of it being an astronomical telescope.

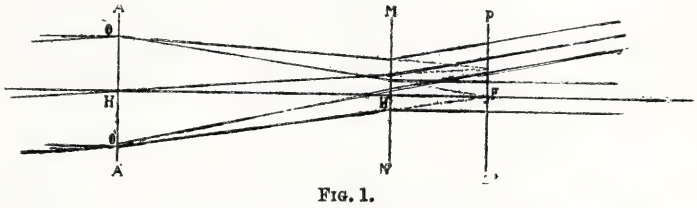


FIG. 1.

In the case of fig. 1, the Galilean telescope, the object-glass and the eye-piece may be calculated together, that is to say, the errors may be eliminated at once for the entire telescope, so that object-glass and eye-piece may have opposite errors. But in the construction represented by fig. 2, the astronomical telescope with micrometer eye-piece, the object-glass and the eye-piece must form correct images independently of each other, if the image of the cross wires has to be distinct and undistorted, as mentioned above.

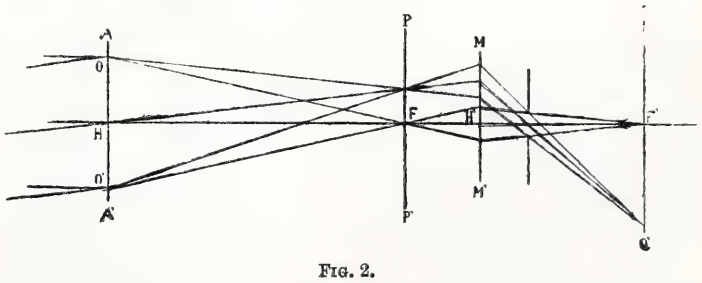


FIG. 2.

In fig. 1 let AA^1 be the principal plane of the objective, H its principal point, F the focal point, and HF the true focus. Let OO^1 be the effective aperture, that is to say the points of incidence of the marginal rays of the axial pencil. The relative aperture, or quotient aperture and focus, will be $\frac{OO^1}{HF}$. The angle OFO^1 is termed the angular aperture of the objective. Let MM^1 be the principal plane of the eye-piece, H^1 its principal point, HH^1 the distance between the principal points of object-glass and eye-piece, then if H^1F be the focus of the eye-piece, the rays forming the axial pencil of light, proceeding from the object-glass, will be transmitted parallel by the eye-piece. At this place the eye-piece is in its nearest position to the object-glass, and this is the maximum limit of amplification. The image is infinitely distant and infinitely large. If the eye-piece be brought still nearer to the object-glass and receive the pencil of light too soon, no image will be formed, because the rays.

[1] Micrometer eye-pieces are simple or compound magnifiers, which are so used that the aerial image formed by the objective in front of the first surface of the eye-piece is reproduced beyond the last surface upon a larger scale. Between the last surface of the micrometer eye-piece and the enlarged image there is a place where the pencils forming the various points of the image cross. This is the position for the eye, and it is of special value for the introduction of stops to cut off reflections from the surfaces of the lenses, or for the use of instantaneous shutters.

will diverge after passing through the lens. If the eye-piece be removed to a greater distance from the object-glass, the aerial image will be brought nearer. This will gradually diminish in size until the eye-piece is so far removed, and so little included, that the image is situate just outside the last glass surface. The image is then scarcely larger than that formed by the object-glass direct. This may be termed the minimum limit of amplification.

We will now proceed to examine the relation subsisting between the foci of the object-glass and eye-piece; the relative brightness of image formed by the object-glass compared with that of the entire telescope, the possibilities of enlargement and size of field, and finally the total length of the telescope as measured from the first surface of the object-glass to the enlarged image.

The intensity of the objective, as is well known, may be expressed in two ways, either by the relative or the angular aperture (angle OFO^1 in fig. 3).[2] If the intensity of the lens be f-6·35, it will be

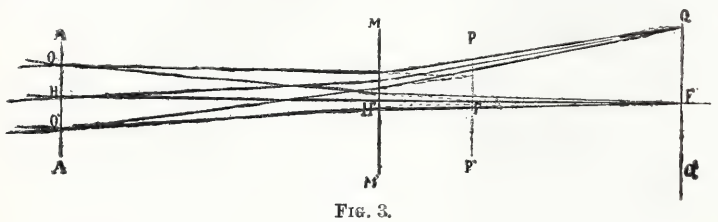


Fig. 3.

equal to 9°. (This is actually the case with a lens of 20 mm. aperture and 127 mm. focus.) By the same number of times we diminish the angle of aperture, we likewise increase the size of the image obtained by the system, when compared with that formed by the object-glass alone, but the equivalent focus of the telescope thus formed also exceeds, by the same number of times, that of the object-glass.

Let us assume, according to fig. 1, that the aperture OO^1 of the object-glass be 20 mm., and the true focus, HF, 127 mm. The relative aperture will then be f-6·35, and the angular aperture 9°. If an eye-piece be required giving threefold enlargement, it must reduce the refraction of the object-glass by two-thirds. The angular aperture of the entire system will then be 3°, the equivalent focus of the telescope $3 \times 127 = 381$ mm., and its intensity will be nine times less[3] than that of the object-glass. In other words, the period of exposure must be nine times greater than for a photograph taken with the object-glass alone.[4]

It has now to be determined where the eye-piece shall be placed, and what shall be its negative focus. The eye-piece may be placed at any point we deem desirable. The nearer it is to the object-glass, the greater must be the length of the telescope. Its size must also be greater, and it will have a larger field. Let H^1 be the principal point of the ocular, and the distance $HH^1 = 84\frac{2}{3}$ mm. The eye-piece embraces the distance, $H^1F = HF - H^1H = 127 - 84\frac{2}{3} = 42\frac{1}{3}$ mm. This is one-third of the focus. The eye-piece placed at H^1, in order to reduce the angular aperture to 3°, must consequently refract − 6°. It should therefore receive a negative equivalent focus of $\frac{2}{3}H^1F = 63\frac{1}{2}$ mm., and refract the rays to F^1. This lengthens H^1F to H^1F^1, that is to say, increases the distance three times. The increase in the equivalent focus of the telescope, compared with that of the object-glass alone, is proportional to the increase of the distance H^1F compared with H^1F^1. As the latter has been multiplied three times, the equivalent focus of the telescope must also be three times greater than that of the object-glass, and consequently equal to 381 mm. We thus find that the combination of an object-glass of 127 mm. focus with an eye-piece of $-63\frac{1}{2}$ mm. equivalent focus, at a distance from each other of $HH^1 = 84\frac{2}{3}$ mm., enlarges the image three times, and the telescope has a length of $HH^1 + 3 \times H^1F = 84\frac{2}{3} + 127 = 211\frac{2}{3}$ mm.

[2] For a comparison of relative and angular aperture, see Eder's "Ansführliches Handbuch der Photographie," Vol. I., part iv., pp. 10 and 11.

[3] It is a well-known fact that the square of the times of enlargement represents the falling off in the brightness of the image and the number of times the exposure must be increased.

[4] The loss of light occasioned by the surfaces of the eye-piece has not been taken into account.

Any number of eye-pieces may be calculated for the same object-glass, all giving the same degree of enlargement. The only difference will be in the length of the telescope and the extent of the field. Directly the angular aperture of the object-glass is reduced from 9° to 3°, the size of the image is the same. The greater the distance between object-glass and eye-piece, the shorter will be the telescope, but the conditions are less favourable for a large field. The further the eye-piece is placed from the object-glass, the shorter must its equivalent focus be. The aperture of the eye-piece must then be smaller, and likewise the size of the field, given the same intensity of illumination. A lens, like that which we have selected as an example, may also be used for enlarging to any size, according to the position in which it is placed. The size of the eye-piece is the only obstacle. It may be too small for the position selected and not admit the whole of the cone of rays transmitted by the object-glass. If the eye-piece be brought closer to the object-glass, the former will work at a larger aperture (cutting off light if too small), and the enlargement and the total length will be increased. If the intensity must be greater, or, in other words, the exposure shorter, the length of the entire telescope must be increased, provided the effective aperture and the degree of magnification remain the same.

So far as I am aware, the first photographic telescope constructed, according to the Galilean type for terrestrial purposes, was supplied by me in February, 1890, to the Hydrographic Department of the German Admiralty, and used for coast photography.

We have already mentioned that it is impossible to make this type of photographic telescope with cross wires, which can be photographed simultaneously with the picture. This is frequently necessary, as for instance in astronomy, and such was actually the case when the first photographic telescope was ordered from me. A different type of construction must then be adopted. The object-glass must give a correct image, although very small. This aerial image is enlarged with a simple magnifier, or a micrometer eye-piece (compound magnifier). We have already mentioned, that the astronomical telescope with micrometer eye-piece fulfils these conditions. The magnification in this arrangement is determined by the position of the eye-piece, whilst the size of the aerial image depends upon the focus of the objective.

In fig. 2, if OO^1 be the principal plane of the objective, H its principal point, and F its focal point, the true focus will be H F, and upon it depends the size of the image of the object. The intensity of image again depends upon the relative or angular aperture of the objective. The cross wires are placed at the focal point of the objective.

If we take the sun or moon as an example—an object of about 34 minutes diameter; the size of the direct aerial image will then be HF tg 34′, which is about $\frac{1}{100}$ of the focus.

The size and equivalent focus of the eye-piece are optional. Any degree of amplification of the aerial image may be obtained with an eye-piece of whatever focus. But the length of focus and effective aperture of the eye-piece determine the length of the enlarging apparatus and the diameter of that portion of the image, which is magnified.

For instance, if the eye-piece has an equivalent focus of 3 cm., and its principal point be 6 cm. from the image formed by the object-glass, then an image of the same size will be formed 6 cm. beyond the principal point of the eye-piece. The distance between the image formed by the object-glass and that formed by the eye-piece, will be 12 cm. and the magnification 1, or natural size.

Any degree of magnification may be obtained with such an eye-piece of 3 cm. focus. It will depend upon the situation of its principal point and where this is placed between the two positions, 3 and 6 cm. distant from the aerial image (one or two foci of the eye-piece).

If p be the equivalent focus of the eye-piece, a the distance between the image, formed by the objective, and the principal point of the eye-piece, a the distance between the principal point of the eye-piece and the image it forms, the well-known relation recurs:

$$\frac{1}{p} = \frac{1}{a} + \frac{1}{a}$$

The magnification may be expressed by the quotients $\frac{a}{-}$ and the intensity decreases with the square of these quotients, if compared with the intensity of the object-glass.

The size of the aerial image to be magnified may increase, as we have already said, with the available aperture of the eye-piece. On the other hand the diameter of the aerial image, which can be magnified, grows in proportion to the equivalent focus of the eye-piece, given the same construction. By means of the table given herewith, the length of the enlarging apparatus may be calculated with ease for any degree of enlargement. The times of enlargement will be found in column I. Take the figures upon the same horizontal line in columns II. and III.), add them and multiply their sum by the equivalent focus of the eye-piece.

I	II	III	I	II	III
1 mal	2·00	2·00	6·5	1·15	7·50
1·1	1·91	2·10	7·0	1·14	8·00
1·2	1·83	2·20	7·5	1·13	8·50
1·3	1·77	2·30	8·0	1·12	9·00
1·4	1·72	2·40	8·5	1·12	9·50
1.5	1·67	2·50	9·0	1·11	10·00
1·6	1·62	2·60	9·5	1·10	10·50
1·7	1·59	2·70	10·0	1·10	11·00
1·8	1·56	2·80	11·0	1·09	12·00
1·9	1·53	2·90	12·0	1·08	13·00
2·0	1·50	3·00	13·0	1·08	14·00
2·1	1·48	3·10	14·0	1·07	15·00
2·2	1·45	3·20	15·0	1·07	16·00
2·3	1·43	3·30	16·0	1·06	17·00
2.4	1·42	3.40	18·0	1·06	19·00
2·5	1·40	3·50	20·0	1·05	21·00
2·6	1·38	3·60	22·0	1·04	23·00
2·7	1·37	3·70	24·0	1·04	25·00
2·8	1.36	3·80	26·0	1·04	27·00
2·9	1·34	3·90	28·0	1·04	29·00
3·0	1·33	4·00	30·0	1·03	31·00
3·2	1·31	4·20	35·0	1·03	36·00
3·4	1·29	4·40	40 0	1·02	41·00
3·6	1·28	4·60	45·0	1·02	46·00
3·8	1·26	4·80	50·0	1·02	51·00
4·0	1·25	5·00	60·0	1·02	61·00
4·5	1·22	5·50	70·0	1·01	71·00
5·0	1·20	6·00	80·0	1·01	81·00
5·5	1·18	6·50	90·0	1·01	91·00
6·0	1·17	7.00	100·0	1·01	101·00

For instance, if it be required to enlarge six times, take figures 1·17 from column II. and 7·00 from column III. Their total is 8·17. If the eye-piece be of 3 cm. focus, the length of the enlarging apparatus must be 24·5 cm. By adding the focal length of the objective, say 24 cm., we obtain the focal length of the telescope, 48·5 cm., whereas the equivalent focus would be 144 cm. According to the well-known rule, this is obtained by multiplying the focus by the magnification.

To compare photographic telescopes with regard to their efficiency, it must be remembered, that the amount of light forming the image is determined by the aperture of the object-glass and that the size of the image depends upon the equivalent focus, and the field made use of. The effective aperture can easily be measured. It is likewise easy to determine approximately the equivalent focus of the telescope and the angle of field used, by photographing the moon. The equivalent focus of the telescope is very nearly 100 times the diameter of the image of the moon. The diameter of the moon is about equal to ½ a degree of visual field. By means of a photograph the equivalent focus and the angle of field may at once be reckoned. For instance, if the diameter of the image of the moon be 11 mm., and the diameter of the entire picture 70 mm., then the equivalent focus is 110 cm., and the field of view rather more than 3°.

I think I have made clear in the foregoing remarks how the two combinations I have described may be used for tele-photography according to the purposes for which they may be required. I have purposely excluded a third type, that of an astronomical telescope combined with a positive eye-piece, as the conditions are not so simple; but I reserve this and will return it on another occasion.

THE LATENT IMAGE.

The term "latent image" is one which is set aside by the majority of photographers as being too full of mystery and too scientific for them to meddle with, and on the other hand one meets with many who talk about it as if they were perfectly acquainted with its composition. Neither class is to be commended, for, in the first place, it is the duty of any photographer worthy of the name to contribute, all he can do to photographic science, and, in the second, nothing very definite is known, or, at any rate, agreed upon, about the latent image.

It is with the hope of presenting the subject in a more brief and intelligible form that this article is written, though, of course, nothing more than a mere suggestion as to its primary nature can be dealt with without going fairly deeply into the subject.

A dry plate when exposed in a camera receives an impression of the object that is photographed. If the plate be now examined, no visible change is evident, though, were the eye about a hundred times more sensitive than it is, the change would be discernible, *i.e.*, the portions affected by light would appear darker than the other parts.

There would be seen, therefore, an image—the "negative" of the object photographed—in a deeper colour than that of the unexposed portions of the film. Quite briefly speaking, this image is the "latent" image, though what its nature is can only be detected or ascertained by analysis of the decomposition products.

Although silver chloride is much less sensitive to light than silver bromide, it is interesting to note that the visible effect is brought about very much more quickly with it than with the latter.

A latent image may be produced theoretically whenever any substance is so affected by light that we are able, by an after process, to bring that effected change into evidence.

Now, the difference between the changed portions of a film and the unexposed is that we are able to carry on the change by "mechanical" means if necessary, and so make it appreciable and of practical value. The name given by Carey Lea to the exposed silver haloids in a plate or paper involves the prefix "photo." Thus, after exposure, a dry plate contains an image of photo-bromide and photo-iodide. When gelatino-chloride paper is printed, the red-brown image consists of photo-chloride, photo-citrate, &c. It has also been suggested that the image contains metallic silver, silver suboxide, &c.

No matter what it is composed of, it is certain the photo-bromide, for example, is so different from the original salt, that we can "develop" it from an almost invisible image to a further reduced and visible picture; in the case of silver, the photo-salt is practically insoluble in sodium thiosulphate, while the bromide itself dissolves easily; in the case of uranium, the photo-haloids are less soluble in dilute alkaline carbonate solutions than the unaffected salts, and may be "developed" with such an agent as potassium ferricyanide.

In certain cases also the action started by light continues after exposure. The most obvious example of this kind is that of dichromatised colloid substances, and the fact that the action spreads to the unexposed portions of the film instead of adhering to the exposed portions is of extreme interest, and rather suggests a distinct classification for these substances, as regards the latent image.

The phenomenon may perhaps be explained by supposing that dichromatised colloids are capable of absorbing or transforming more energy from light than metallic salts, for, so far as we know, neither the salts of silver, uranium, iron, copper, nor cobalt, exhibit this tendency, though it is met with under certain circumstances in the case of platinum. But as colloids, whether dichromatised or not, become insoluble when mixed with pigment in the usual manner, after a certain time a severe complication arises.

It might at first thought appear that halation is a direct result of spreading action of this nature, but it is apparently only due to the

wo causes already assigned to it viz., reflection of light from the back of the plate if "unbacked," or the refraction of light through an imperfectly constructed lens, at points where the difference of distances from the diaphragm is about a wave-length greater than the distance to the centre of halation.

If two sheets of silver coated with silver haloid be immersed in a cell, a current of electricity may be observed when one plate is exposed to light, the other being kept in darkness. Currents may be similarly obtained from moist films placed between gauze electrodes, one side only being exposed to light. Hence it may reasonably be supposed that electricity is more intimately connected with dissociation resulting from the exposure to light of sensitive compounds than it is with ordinary dissociation. For example, nitrogen peroxide is split up from N_2O_4 into NO_2 molecules when it can absorb sufficient energy from heat supplied to it. Similarly we may suppose that the decomposition of silver haloids is due to transformation of light energy into electrical energy.

Whether the salts of such an electro-negative element as silver are ionised merely in a light-vibration medium has yet to be shown.

T. Thorne Baker.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM. OXFORD MEETING, 1901.

Synopsis of the Week's Proceedings.

Monday, July 8th.

Excursion in and around Oxford.—Parties will, at convenient times, be conducted over the Colleges, Public Buildings, &c.

Proceedings.—At the Town Hall, at 7.30 p.m., official opening of the Convention by the Mayor, after which the new President will deliver his Presidential Address; followed by an exhibition of specially selected lantern slides.

Tuesday, July 9.

River Excursion to Abingdon, Day's Lock, &c.—Special steamer leaves Folly Bridge at 9; arrives at Abingdon about 11.30; luncheon in the Council Chamber, Abingdon, at 1; steamer leaves Abingdon at 2; arrive at Day's Lock about 3.30; tea on board, 5; steamer leaves Day's Lock at 7; arrive at Oxford at 8.30.

There will be no meeting at the Assembly Room on Tuesday evening.

Wednesday, July 10.

Excursion to Worcester College.—Reception and Garden Party by the President at 3 p.m.; the official convention group will be taken by Messrs. Hills and Saunders at 3.15.

Proceedings.—At the Assembly Room at 10 a.m.; the Annual General Meeting, Election of Council, &c. Meeting of the new Council at 11 a.m.; at the Clarendon Hotel, Annual Dinner and Smoking Concert, at 7 p.m.

Thursday, July 11.

Excursion to Warwick, Kenilworth, &c.—Train leaves G.W.R. Station, 8.42; arrive at Warwick, 9.56; lunch at the Court House, Warwick, 1.30; brakes depart for Guy's Cliff, Kenilworth, &c., as may be arranged; train leaves Warwick, 5.57; arrive at Oxford, 7.17.

Proceedings.—At the Assembly Room, at 8.30, an address by Professor H. H. Turner, M.A., F.R.S., &c., on "Photography in relation to Astronomy;" an exhibition of lantern slides by members of the Oxford Camera Club.

Friday, July 12.

Excursion to Banbury, Broughton, &c.—Train leaves G.W.R. Station, 8.42; arrive at Banbury, 9.17; brakes leave for Broughton, 10,30; brakes leave Broughton for Compton Wynyates, &c., 12; lunch at Compton Wynyates, 2; brakes leave Compton Wynyates, 4; arriving at Banbury at 6; train from Banbury at 6.45; arrive at Oxford, 7.17.

Proceedings.—At the Assembly Room, at 8.30, a Paper by Dr. Moritz von Röhr on "Short Focus Lenses, with special reference to depth of field;" a paper by Mr. G. Watmough Webster, "Seeing not Believing;" a demonstration with the Projection Microscope and Polariscope, by Mr. W. Wyatt (Lancaster).

Saturday, July 13.

Various short excursions to places in and around Oxford will be arranged as may be required. Members will oblige by signifying their wishes to the Hon. Secretaries as early as possible, in order that satisfactory arrangements may be made for the desired excursions, and particulars duly posted on the notice boards.

AMERICAN PROFESSIONAL PHOTOGRAPHY.

The American invasion is on every one's lips just now; our cousins across the sea are buying up our steamships, running our electric railways, dominating our Stock Exchange—even, with sublime audacity, winning our Derby and Oaks. The subject has its interest, from a photographer's point of view, also, when we see the growing favour in which American-made cameras are held, and the strong and much discussed attitude of a certain well-known Transatlantic company for the supply of photographic materials. While we can, doubtless, afford to smile at the absurdity of those alarmists who can for a moment seriously think that British trade supremacy is at all in danger, it is apparently beyond contradiction that our Yankee friends have a certain business ability and a forceful, decided way of doing things, which, perhaps, we may do well to follow. Under the circumstances, it is not unnatural that some of us have been asking how American professional photography compares with ours, and whether in this direction, as well, they have secrets of success which would be worth our while to study and imitate.

Careful inquiry and comparison seem to prove that, in the higher class of photographic work, both professional and amateur, it is not unduly flattering our national vanity to say that we hold our own, although by no means with the greatest of ease. It would, perhaps, not be unjust to declare that where the best British excel the best American photographers, if at all, is in their greater attention to technique. American work, even the highest, often shows a carelessness in this respect, a lack of regard for that scrupulous and minute study of every detail in the mechanical part, that is always so gratifyingly evident in the productions of our own leaders. Without making any innuendoes, or specifically attacking any particular worker or school, is it not, to some extent, true that in America rather too much credit has been given to certain false teaching of so-called Art—art only in name and not in reality, which, in its more aggravated forms, seems to think that the less like a photograph the production of the camera can be made, the more triumphant is the success of its creator in evading the narrow trammels of mere formula and routine, and in causing his individuality to shine forth from the print? We by no means wish to infer, of course, that first-class professional work in the States exhibits this influence to any very great extent, or that work of the description condemned is at all representative, our meaning will be better understood if we say that there is a decided taint or leaven of the evil ideal mixing with otherwise sound and admirable execution. However, as has been said, America at her best has no cause to be ashamed, producing, as she does, many brilliantly clever workers of international celebrity. The average charges for the best work are rather lower than we are accustomed to, although some artists favoured of the élite command practically fancy prices. Women workers are much in evidence there, in the higher branches of photography; some of the finest and most original productions in the chief cities, more especially in New York, coming from their studios, and deservedly securing for them a large and profitable share of that pecuniary guerdon of success which few of us can afford to ignore.

Let us go from the highest to the lowest, and ask how the cheap and nasty American photo compares with its British contemporary? The ferrotype plays there a much more important part in lower class work than it now does on this side the Atlantic, and is turned out by the hundred thousand in the paltriest and commonest forms. The plebeian part of the Transatlantic public is, probably, even more Philistine and tasteless than their equivalent over here, as perhaps might be expected, considering its heterogeneous composition and mixture of many nationalities, at any rate in the larger towns and cities. It is perfectly true that the worst of our work is quite as horribly inartistic and painful as anything to be seen in the States, perhaps the only difference to be noticed in favour of the latter is that over there they certainly seem to make their commonest productions pay them better than the corresponding class of work does here. That is the special point to be marked in the character of the followers of the "Star-spangled Banner," the intensely practical and businesslike way in which they carry out even the simplest proceedings of everyday life, and their talent for the acquisition and multiplication of the "Almighty Dollar." One is tempted to recall the anecdote related of an American naval officer just after the war with Spain had been brought to a successful termination. A British friend had been laughingly commenting on the imposing character of the armaments on American ships, and the elaborate attention given to gun practice. "Oh," said the man of warlike deeds, reproachfully, "you want to kill your enemy, don't you? We do." In like manner the Yankee business man practically lives up to the saying, "You want to make money, don't you? We do." And is far from ashamed of it.

Grotesque and comic ferrotypes of the kind representing the sitter's head on a donkey's or some other animal's body—the variety of photograph, in fact, which we have learned to associate with side-shows at exhibitions—are more popular in America, and pay their producers

well; there, at any rate, the day of the ferrotype is not yet over. These cheap productions, intended to please and satisfy the uncritical masses, and making no pretensions whatever to artistic merit, call for no particular comment. The clientèle, mode of carrying on business, and methods of working are practically the same as we find here. More is done in the way of cheap enlargements, of which a large quantity are turned out, of by no means bad quality. The Yankee photographer generally makes his own enlargements, and gives little patronage to the "trade."

It is in middle-class photography, however, that America can afford to give us a hint or two. The portraits they produce at from as low as two to four dollars a dozen are, in the majority of cases, strikingly superior to anything done in this country at the same price. The finish is better, more pains are taken at every stage, and the general result is incomparably more artistic than the corresponding medium-grade British production. The middle-class American photographer is, as a rule, thoroughly up-to-date. He will have in his studio the best and most modern apparatus he can afford, the most tasteful backgrounds and accessories. He is generally better appreciated, and, on the whole, treated with more respect than his British confrère, well-educated in the pictorial possibilities of his business, yet always seeking rather to give his customers what they desire than to satisfy his own private fads as to how the work should be done. He mostly shows considerable taste and an acute judgment of what will "take" in the arrangement and display of his showcases. He never lets a chance go by for want of a little pushing or puffing, which latter he carries to an extent that would, perhaps, seem infra dig. to some of us. While never losing sight of the fact that he is running his studio for profit, and not for amusement, he is, on the whole, full of a praiseworthy anxiety to give his public the best possible value for their money. He bestows particular care on the finish of his work, rarely has other than neat and tasteful mounts, and attains, generally, a rather high level in lighting and posing. The owner of the middle-class photographic establishment in the States, too, will mostly be found to pay much more attention to smartness and effect in outside appearance, furnishing, and those other aids to business prosperity which some of our own fraternity are so careless of. He will not be content so long as any possible improvement within his means and power remains unaccomplished, but is ever restlessly seeking to do better. Taken altogether, specimens of the intermediate grade of work under discussion would come as a wholesome surprise to many of us. They are a standing proof that moderate charges are not at all incompatible with a consistently exalted standard.

The cost of living, house rent, and other things are much higher in the States, as are also salaries; but in the case of photographic materials and accessories there is no particular difference, some things, in fact, being even lower in price than they are here. With increased cost of production against them, it is rather remarkable that the cheaper run of photographers manage to make their work pay so well. The secret is to be found in their wonderful appreciation of business methods and unfailing grasp of those things which make for success. They do not sit down and wait for it to turn up, à la Micawber, but lay their hands firmly on it, and bring it to them. To reach the conclusion of the whole matter, the lesson, it seems, which our Western brothers should, if we are wise, succeed in teaching us, is that we must move with the times, endeavouring to be beforehand, rather than behind, with the march of improvement, and that we must get out of a habit we are rather too fond of, namely, expecting the cart to move without putting our shoulders to the wheel.

A. Lockett.

THE PROFESSIONAL SECTION AT THE R. P. S. EXHIBITION.

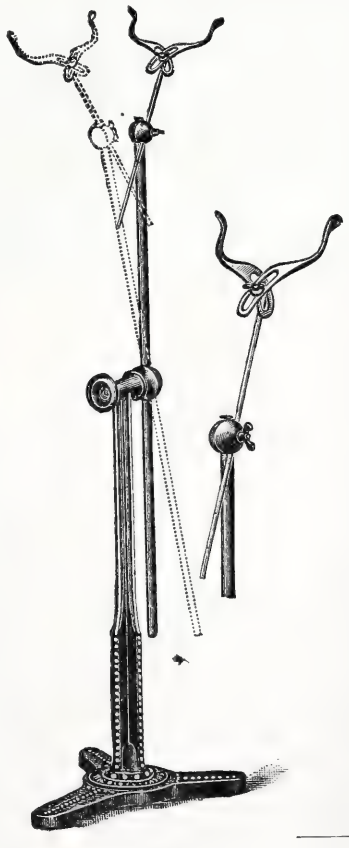
As we are aware that a large number of our readers are interested in that section of the Royal Photographic Society's Exhibition, at the New Gallery, Regent-street, next October, which embraces non-competitive work, we reproduce from the prospectus the special details relating to it:—"Section II. General Professional Work.—The walls of the North and South Galleries will be set apart for a non-competitive Exhibition of general professional work, including portraiture, figure studies, and groups, landscapes, architectural, and engineering photographs, exterior and interior work, &c. No restrictions are imposed as to date of production, or as to the previous exhibition of work for this section. This section will be under the management of the committee and subject to their regulations, and the right is reserved to reject any work that is considered to be unsuitable. Allotment of space and charges.—Two methods will be adopted—(a) Space will be let to exhibitors who wish to make a collective exhibit of their work, which they must arrange to hang. Drapery and other decorations will be allowed. The scheme of decoration proposed must be submitted to the committee for their approval. Space will be charged for at the rate of ten shillings per foot linear, payable on allotment. The committee do not bind themselves to allot any particular position, but will duly consider priority of application in their decision. Applications for space (specifying the amount required) must be made by letter, addressed to the Secretary of the Society, 66, Russell-square, London, W.C., on or before Saturday, July 13. A plan of the North Gallery may be obtained on application to the Secretary. (b) One or more works may be sent to be displayed in the space devoted to general exhibits. The committee do not bind themselves to hang the exhibits of any exhibitor together. The charge for space will be at the rate of one shilling per square foot occupied, with a minimum of five shillings, the amount to be sent with the entry form."

Last year it will be remembered that both galleries were filled with a great collection of portraits and enlargements: and it was obvious that the section met the requirements of those who sought an opportunity of attracting public attention to commercial photography in its various branches. No doubt this year the same desire to take advantage of it will be felt. It will be observed that portraiture, figure studies, and groups, landscapes, architectural, and engineering photographs, exterior and interior work may be shown in the section: and the work need not be new or specially prepared. Hence, the section makes a wide appeal to professional photographers, enlargers, &c. A full prospectus may be obtained on application to the Secretary of the Society at the above address.

Our Editorial Table.

The "Sickle" Head Rest and Screen.

Manufactured and Sold by O. Sichel and Co., 52, Bunhill-row, E.C.



Finished in black and gilt, the head rest shown in the accompanying illustration has some movements and adjustments which deserve the notice of those who in studio work expect an accessory of the kind to answer a variety of requirements. Thus, as shown by the dotted part of the diagram, the upright rod may be swung to the right or left, and clamped at any desired angle or height. A Universal ball joint allows of similar control over the cross rod, whilst slots in the ear prongs permit these to be adjusted to the head. In the majority of studios it is probable that the head rest will long remain in use. The form to which we are here referring appears simple and convenient to manipulate. To their long list of useful accessories in studio portrait work, Messrs. Sichel, who so intelligently cater for the needs of the professional photographer, have also added a light and useful head screen. The functions of such a screen are almost too obvious to need mention—every photographer recognises its value in controlling the light on sitters and their surroundings. The screen, which can be adjusted to any height, is supported by nickel-plated rods. The joints are cam-lock fitted, and the base is japan finished.

The New Process Daylight Film Cartridge.

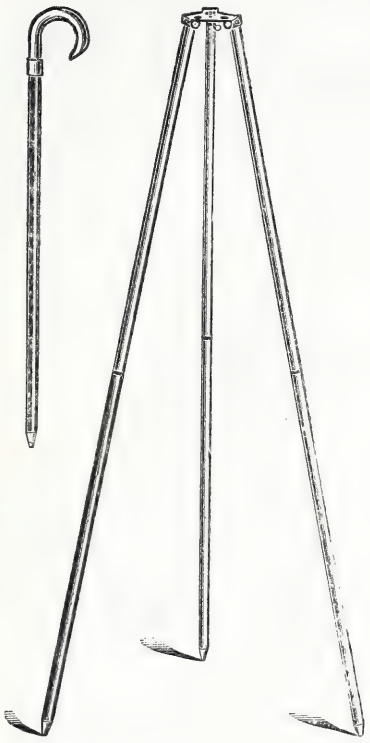
The European Blair Camera Company, The Mills, Foots Cray, Kent.

The great convenience of the daylight loading has occasionally its drawbacks, particularly with respect to the setting off of the painted numbers, and a reducing action of the black paper in contact with the sensitive surface under certain conditions. In order to overcome these troubles, and also to enable the numbers to be distinctly seen through the red window of the camera, these new process spools have been introduced, the novelty being in the use of a perfectly pure white paper, which alone comes into contact with the sensitive emulsion. This white paper is perforated with the numbers, which show very plainly against the black paper, and also at the edges, to indicate where the film is to be cut between the exposures. The new spools are operated in precisely the same way as the old, and their introduction will no doubt be welcomed by roll film users. The additional paper adds practically nothing either to the weight or bulk, and special machinery having been devised for the same, the perforations are

always uniform and plainly to be seen. The emulsion works cleanly, and with brilliancy, shows no tendency to frilling or blistering, and is of high rate of speed, the sample sent us marking 110 Hurter and Driffield by standard pyro developer.

The "Practical" Walking Stick Stand.

Manufactured and sold by George Houghton and Son, 88 and 89, High Holborn, W C.



The latest adaptation of the camera stand to the form of a walking stick has many features which recommend it to the notice of those with whom portability of apparatus is a desideratum: It is made of steel tubing, the joints sliding one into the other. The outer tube is enamelled black. A 3¾ in. metal top, with a screw, is provided, and this when detached can be conveniently carried in the pocket. To complete the walking stick a nickel-plated crook handle is supplied. The dimensions are: Height when set up in use, 58½ inches; length of stick when closed, 34 inches. We have used this form of stand in practice, and have found it rigid and easy to handle. It is interesting to reflect that after ten years of the hand camera fever, manufacturers and the trade find the same necessity as hitherto of catering for the requirements of those whose photographic work demands the use of a stand. Evidently there is a large class with whom the careful composition of the picture on the focussing screen, is the only satisfactory way of working.

How to Take and Fake Photographs. By Clive Holland.

London: C. Arthur Pearson, Henrietta-street, Covent-garden, W, C. 122 pp., price 1s.

Frankly, we look upon this book as a disappointing production. Our shelves are covered with scores of elementary text-books on photography quite as useful as the one before us. Mr. Clive Holland, whose ability as a photographer and a writer we willingly admit, can surely find some fresher field for his powers than that devoted to the taking and faking—why "faking," Mr. Holland?—of photographs. The phototypic reproductions in the book are capital, and prove Mr. Holland to be expert in the use of a hand camera. Beyond this we find it difficult to carry commendation unless it be to say that the author dishes up his text in a manner neither better nor worse than the crowd of elementary-book writers to which he is one of the latest additions. Still, if it were not for the existence of the others, we would like to say that Mr. Clive Holland's book should be found useful by the beginner. But the poor beginner is already so well catered for in this matter that we think he should be left alone a little while. Let Mr. Holland drop this jejune sort of thing and give us of the best that is in him, and he will receive our blessing.

Imogen Sulphite.

A. and M. Zimmermann, St. Mary-at-Hill, E.C.

It is impossible to determine more than the general characteristics of a new developing agent without subjecting it to the practical test of using it under varying conditions of photographic work. We have satisfied ourselves, however, that imogen sulphite has a fair claim to favour among photographers. The necessary solutions are easily prepared, being a 1 to 12 solution of imogen sulphite, a saturated solution of carbonate of soda, and a 10 per cent. solution of bromide of potassium; the last-named solution is not required under normal conditions, but only in cases of over-exposure, &c. The developer, mixed according to the instructions, we found produced negatives of a warm black colour, free from fog, with ample density, and of good gradation. The time required for completion of development was remarkably short. Several plates were developed in succession in the same solution, and there was no appreciable falling off in its energy. The developer does not stain the gelatine, neither does it appear to affect the skin.

The "T. I. C." Carbon Colour Chart.

Prepared by Thomas Illingworth & Co., The Photo Works, Willesden Junction.

Messrs. Illingworth have recently completed the erection of a factory having over 5580 square feet of floorage, filled with the latest machinery for the manufacture of carbon tissues and papers. Before us is their new colour chart, which consists of a portrait of Miss Lily Hanbury, in eighteen tints. "A Chat on Carbon Work," by Mr. Illingworth has also reached us. It is an excellent little advocacy of this admired process. We quote one paragraph specially addressed to professionals: "Taking the case of a professional worker, one might ask 'Is it a profitable process?' We say, undoubtedly the most profitable of all the processes, for by it one makes a reputation for high-class work, and is able to obtain a much higher price for his results. The professionals who are now making a success of photography are those who are studying to make pictures of their subjects, not the usual 'Now-look-pleasant-thank-you' results, but results which show their sitters in the best possible manner, and at the same time make a picture, which is pleasing to the eye. These are the men who are making enviable reputations, and enviable profits, and without exception they all use the carbon process, as the means of sending out to the public their imperishable work." The specimen carbon prints that have been sent us by Messrs. Illingworth are excellent, and the firm deserves success in its new sphere of enterprise.

The "Coupall."

Wellington & Ward, Elstree, Herts.

The "Coupall," or as it might be termed, the Wellington film system, is an ingenious but simple plan of relieving the film photographer of the slightest necessity to trouble himself about the development and printing of his exposures. Precisely how the system works out in practice is so well described by Messrs. Wellington and Ward in their pamphlet that we quote the essential parts of it for the information of the reader, to whom we will suppose Messrs. Wellington and Ward are speaking: "In future you will be able to purchase from any photographic dealer tickets or coupons, bearing our registered name 'Coupall.' These will be sold singly or in sheets of six or twelve, and are issued for four different sizes of cameras at proportionate prices. Each coupall represents payment for the development of one negative, or the printing of one unmounted P. O. P. or bromide print, of the size to which it refers or of any smaller size. All that is necessary is to post the films for development or printing to us, accompanied by a sufficient number of coupalls to cover what work you want done. You pay the postage to us we pay the postage to you. An example may make the system clearer. Let us suppose you have a roll of film, twelve exposures, 4¼ by 3¼. You expose it, and wish to have it developed, and a print taken off each. When you bought the film you would buy with it two dozen yellow coupalls (that is, two sheets of a dozen each), at a cost of 2½d. each, that is, five shillings for two dozen coupalls. You post the roll of exposed films, with the coupalls, to us, not forgetting to state when doing so from whom they come (name and address). On receipt of the film we develop it (for one dozen coupalls), and make twelve prints, one off each negative (for one dozen coupalls), posting you the negatives and prints. If two of the twelve exposures sent us by you appeared on development never to have been exposed at all, we return you the coupalls relating to them, for use again. If of the other ten only nine were printable, we only print those nine, and charge you for them, returning the unused coupalls. Thus you would get back ten negatives, nine prints, and five unused coupalls. The coupalls can be used at any time within about eighteen months. If they cannot be used in that time post them to us, and we will change them, without charge, for coupalls available for a further similar period. If you find you cannot use them we will change them for any of our goods of the same value as the price paid for the coupalls." The Wellington film system of coupalls seems to us an excellent means of further popularising film photography. On the one hand, it saves trouble to the manipulator of the camera; on the other, the dealer has the inducement of a liberal discount to promote the sale of "coupalls." It should prove advantageous to those parties directly interested in it.

Shrewsbury School and its Surroundings is an excellent account of the great public school which is so delightfully situated on the Severn, in its course through the capital of Salopia. The book is published by Messrs. Adnitt and Naunton, The Square, Shrewsbury, and the half-tone illustrations are from photographs chiefly the work of Mr. W. W. Naunton, who, as might have been expected of a man of his great ability, has made some first-class negatives of congenial subjects. It is altogether a pleasing book.

The Year-book of Photography (edited by Mr. P. R. Salmon, F.R.P.S., and published at 9, Cecil-court, Charing Cross-road, W.C.), has just been published. The first article deals with carbon printing in terms of such simplicity that the amateur worker could hardly fail to grasp the principles and practice of this excellent process. "Photography in the Woodlands" supplies Mr. J. T. Ashby with a theme

which he treats and illustrates in a most engaging manner. The Tourist's Companion and Holiday Guide, occupying 70 pages, should be found of service by the photographer who has the opportunity of taking his camera far afield. Mr. C. Goodwin Norton writes on optical lantern matters, and the compiler of the Facts and Formulæ, Mr. E. J. Wall, includes in that section some very useful information. The illustrations, especially those from Mr. Ashby's negatives, are charming, and the "Year-book" well maintains its place as a readable and reliable guide-book.

THE latest catalogue of Messrs. W. Watson and Sons, 313, High Holborn, W.C., is a 220-page production which illustrates and describes a modern variety of photographic instruments and apparatus. It should be in the hands of all photographers and other persons anxious to be kept au courant with the most recent introductions to the market. From the catalogue we extract the following particulars of Messrs. Watson's progressive payment system:—Any instrument in the list of or exceeding £5 in value may be purchased by monthly instalments on the following conditions:—The time allowed for payment may be spread over a period not exceeding twelve calendar months. The amount is to be paid in equal monthly instalments. An extra charge of 10 per cent. on catalogue prices is made for the accommodation. If the purchaser be a householder he should state the nature of his profession or employment, how long he has resided at the address given, and give an ordinary business reference. The nature of the business will not be disclosed to the referee if objected to. If the purchaser be a minor or not a householder, he must state the nature of his profession or employment, the time during which he has been so engaged, give the name of the business house with which he is connected, and of a householder who will guarantee the payment. The purchaser must agree not to part with the instrument purchased on this system, until the complete instalments have been paid. The first instalment should accompany the order. Messrs. Watson reserve to themselves the right to refuse to accept orders on this system should they wish to do so. Example: A camera value £10 may be selected, 10 per cent. added to this brings the cost to £11. If the payment be spread over a period of 12 months, the monthly instalments will be 18s. 4d. each.

Studio Gossip.

THE Dark Hole of Photography.—"Whilst the Artists' Benevolent Fund flourishes in the light and spreads its blessings upon indigent artists great and small, including in some degree those occupied in the work of engraving, no sign can be traced of the existence of any such institution for the benefit of photographers," writes our contemporary, "The Sunday Times." "The art of photography has to a large degree permeated society, there is scarcely a family of the upper or middle class but can count a photographer among its members, and there is no doubt but that those who have hitherto failed to take any interest in the present subject should hereupon immediately interest themselves. The number of men and women employed in the various processes of photography increase daily, we might almost say hourly, and some of these processes entail conditions that must necessary be trying to a degree to the human physique. To the workers in the dry plate and paper factories the light of day is a luxury which they can only have on Sundays, if then, and the demand on the labour in this department is so great as to call for night as well as day work. To live, shut out the light, except for the dim red light of petroleum oil lamps in chambers where there must be no stir of air that might circulate the dust, is not conducive to the preservation of a robust condition of health, and this condition is entailed on the workers in the dry plate and developing departments of photography. Those who gaily send their negatives out to be developed because it saves trouble and is so inexpensive should remember the workers. The employed are probably the recipients of much kindness in individual cases, but there is apparently no organization whose duty it is to consider any case of distress, however real. The larger company works have, we gather, friendly societies; but the constitution of these are not made public or clear. We do not know that even subscriptions to the friendly societies would offer any advantages to those who belong to it, leaving the establishment to go to other works, and so prove themselves to be really friendly societies. Prevention is better than cure, and holiday funds should be provided, especially for those whose lot it is to dwell in the dark hole of photography. We, again, preach the federation of charities, and call upon photographers who work upon a large and those upon a small scale, the managers of dry-plate and other companies which take up any part of the art, the secretaries of any friendly and provident and benevolent societies for photographers that may be already in existence, to meet together, to confer and criticise each other, and, if possible, to federate, or out of these various bodies, if they already exist, to form one general body, whose duty it will be to consider any case deserving of relief, to assist the families, widows, and orphans, and to help the disabled. We saw last week, but only for a few moments, a manager or representative of some large works, who, unless a hardened villain, had all the appearance of being possessed of a conscience effervescing with the sense of virtue attained or near at hand. Let us hope it was the latter. And we trust that none of the managers and secretaries will withhold either help or information, and declare themselves to belong to the churlish and obstructive brood of those who will neither learn nor teach."

News and Notes.

THE Röntgen's Society's Annual General Meeting will be held on Thursday, July 4, 1901, at 20, Hanover-square. The chair will be taken at 8.30 p.m. Mr. G. Bowron will show an oscillometer for measuring the current and oscillations in the secondary circuit of an induction coil or similar apparatus.

THE Thornton Film May Competitions.—The prize of a folding camera awarded for the best negative on Thornton films has been won by Mrs. J. Hamilton Mitchell, of Edinburgh. The cash prizes for best prints on Thornton papers have been awarded as follows:—First prize, Mr. F. J. Matthews, of Chelmsford; second prize, Mr. A. E. Bunett, of Bristol; third prize, Mr. A. Gray, of Chelmsford.

PHOTOGRAPHING in Hyde Park Without a Permit.—Last week Mr. Ernest Gardner, of the Constitutional Club, Northumberland-avenue, was summoned at Marlborough-street for having taken a photograph in Hyde Park contrary to Rule 8 of the Park regulations. On the morning of the 10th inst., Mr. Gardner was seen photographing two ladies in a dog-cart in Hyde Park. Asked if he had authority to take photographs, Mr. Gardner replied that he could get a permit at any time, and requested the constable to keep back the crowd, and then, in the interests of the photograph, to go in front of the horse and clap his hands to make the animal prick up his ears. (Laughter.) Mr. Fenwick: Did you do that? The Constable: No, sir. (Laughter.) Defendant said that although he knew it was necessary to have a permit to take views of the Park he was not aware authority was required for the kind of photograph he was taking. Mr. Fenwick: It is necessary. Upon the defendant's promise not to break the regulation again, Mr. Fenwick discharged him on payment of two shillings, the cost of the summons.

Commercial & Legal Intelligence.

MR. Jonathan Fallowfield, of 146, Charing Cross-road, London, W.C., is issuing a special list of apparatus and materials for ferrotype and positive work.

MR. James Stuart, photographic dealer, of 34, Frederick-street, Edinburgh, announces that he has now removed to his new premises at 22, Frederick-street.

SOME tasteful engraved designs for the backs of c.-d.-v. and cabinet mounts have been submitted to us by Messrs. H. and W. Green, Crown Manufactory, Rotherham.

FROM Messrs. Edmeads and Co., of the Photo Works, 30, Burchell-road, Peckham, S.E., we have received a revised price list of enlarging, printing, finishing, &c., the charges for which appear to be moderate.

THE Thornton-Pickard Manufacturing Company, Ltd., of Altrincham, write: "You will doubtless be pleased to hear that our prize competition is evidently becoming very popular, as we have received an application for entry form from the 'Man in the Moon.'"

FROM the City Sale and Exchange, 54, Lime-street, Leadenhall-street, E.C., we have received a 210 page catalogue of photographic apparatus, &c. A glance through its pages shows the catalogue to be a compendium of all modern photographic requisites. It should be found useful for reference by those desirous of acquainting themselves with what is newest in photographic goods. The list is sent post free on application.

AN Important Sale.—By order of Messrs. J. Bulbeck and Co., the well-known photographers of the Strand, who are retiring from business, Mr. J. C. Stevens, of 38, King-street, Covent Garden, will sell on Tuesday, July 2, a valuable collection of high-class photographic apparatus, including the entire stock of studio, landscape, enlarging, hand cameras, and other photographic appliances; Goerz and Zeiss lenses of various sizes, and descriptions; several shutters, backgrounds, printing frames, dishes, developing sinks and other fixtures. The goodwill and stock of negatives will also be offered at the same time. Catalogues may be obtained of Mr. Stevens, at the above address.

Patent News.

THE following applications for Patents were made between June 10 and June 15, 1901:—

ALBUMS.—No. 11,834. "Improvements in Albums, Scrap Books, Mounts, and the like." JOHN CHARLES WILKINS.

DEVELOPERS.—No. 11,866. "Manufacture of Photographic Developers, Stable in the Dry State." (Actien-Gesellschaft für Anilin-Fabrikation, Germany.) CHARLES DENTON ABEL.

PRINTING FRAMES.—No. 11,893. "Improvements in Photographic Printing Frames." EDWARD THOMAS DARKE.
DARK ROOM LAMPS.—No. 11,955. "An Improved Non-actinic Lamp for the Use of Photographers in the Dark Room." PERCY PARNALL GIEVE.
LENSES.—No. 11,976. "Improved Lens Combination for Photographic, Telescopic, and Optical Uses." EDWARD FERDINAND GRÜN.
DEVELOPMENT.—No. 12,161.—"An Apparatus for Developing Photographic Films without the Operator going into the Dark." MAX REICHERT.
PLATE AND FILM DRIER.—No. 12,171. "Improvements in or connected with Mechanically Acting Devices or Appliances, for drying Photographic Plates, Films, and the like." EDWIN JOSEPH BIGGS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
1.....	Walthamstow Photo.....	Annual General Meeting.
2.....	Gospel Oak	Beginners' Evening: "Ten Minute Papers."
4.....	Röntgen Society	Business Meeting.
6.....	Borough Polytechnic.....	Excursion: Oxshott. Leader, P. C. Cornford.
6.....	Croydon Microscopical Society	Excursion: Keston Common and Holwood Park. Conductor, Dr. Franklin Parsons.
6.....	South Manchester	Excursion: Arley Pool. Leader, A. E. Casson.
6.....	Walthamstow Photo.....	Excursion: Stone Church.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 20,—Mr. A. Mackie in the chair.

Mr. A. J. Brown showed a printed page from a magazine and, pointing to a picture of Lord Roberts that was superimposed upon the letterpress, asked whether the page was printed at one operation from a single block or whether there were two printings. The page was passed round, but no authentic explanation was offered.

Mr. J. E. Hodd showed a Cooke lens, and drew attention to the method of focussing for near objects, the lens being intended for the hand camera. The adjustment of the focus for near and distant objects is effected by separating the front and back lenses by a rotation of the front cell, and objects from infinity to as near as three yards may be rendered in this way. He did not know whether the flatness of field were affected, but apparently not. A scale on the lens mount indicates the various distances, and the device is intended to do away with the rack and pinion in the cameras to which it is fitted.

Mr. A. L. Henderson passed round two negatives that were exposed on one subject for the same time, and developed together in the same tray with ortol. One of the plates presented an ordinary appearance, but the other was stained very deeply a red colour. Mr. Henderson expected that a strange plate had crept into the box by accident, but he could not explain the occurrence. The plates were five years old, and were therefore somewhat stale as they showed at the edges. He also showed a plate that had been developed unexposed, and yet showed very strongly the marks caused by creases in the tissue paper separating the two plates.

Mr. A. Haddon said that when ortol oxidised it turned to the colour shown (Bordeaux red), and so if the negative had been exposed for some time to the air with some ortol developer remaining in it, the same colour would result.

The nomination of officers and committee took place in anticipation of the annual meeting next week; and Messrs. R. J. Kindon, and A. W. W. Bartlett, were appointed auditors of the accounts. The rest of the evening was devoted to the handing in of notices of motion for the annual meeting.

North Middlesex Photographic Society.—June 24. — Mr. Norgate showed a lot of home-made apparatus made from simple materials, from a tele-photo attachment to vignetting frames, which showed much ingenuity. An extension for the front of the camera to hold a negative lens for tele-photo work proved effective in his hands; the lens only cost a small sum, a great magnification being obtained.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SOUTHSEA AMATEUR PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—You will see from the enclosed that, for the purposes of the summer outings, we have combined with two other old-established and kindred societies of this town, and so far our excursions (we have had four) have been very successful. You will notice also that we have secured as patrons the Mayor of Portsmouth and our Members of Parliament. The Mayor is also offering a gold medal for our forthcoming exhibition, particulars of which I will soon be able to send you.

On Saturday (15th inst.) we had a most enjoyable excursion to Bosham—famous for its picturesque fisherfolk and muddy creek and fine sunsets. There were several barges alongside the old quay, and the tide was out, so with the stranded boats and much wreckage, which is always about this district, the members of the Photographic Society were able to secure much pictorial matter. The Vicar of the quaint old church was also in attendance, and gave a most interesting lecture about Bosham and its legends, and a well-served tea in the Gloucester Inn helped to make the outing one of the most enjoyable of the season up to the present.

The Mayor of Portsmouth (Alderman A. L. Emanuel, J.P.) will be the leader of the outing to Guildford in July, as you will see, and he will entertain the members of the societies there.

Altogether I think we are likely to be able to record at the close of the year a most successful summer season.

At a recent Council meeting of this society I was appointed delegate to the R.P.S. from the Southsea Photographic Society, vice Colonel H. W. B. Bruno, who has left the district.—I am, yours, &c.,

5, Pembroke-road, Portsmouth. F. J. MORTIMER, Hon. Sec.

KODAK, COERCION, AND PRICE-CUTTING.

To the EDITORS.

GENTLEMEN,—Mr. J. A. Reid is a stranger to me, and I am sorry if I have hurt his feelings. When I read his letter of the 3rd inst., I thought it probable he was a dealer. But his previous communication on "American competition and other matters" has come under my notice, and it relieves me of that idea. I find, instead, that he is one of those benevolent people who think it their mission to give advice, without having first settled whether their own views are correct or not. In his last letter he admits it is quite possible he had given expression to fallacies, that he was aware he was laying himself open to criticism, and that he might be wrong in his views of what he is pleased to call "indiscriminate price-cutting." The same is equally true of some of his opinions "concerning American competition and other matters." Whilst favouring a certain amount of protection from the American invasion, which he would secure by partly appropriating American profits for our national exchequer (by what means he does not explain), he is still of opinion that a general policy of protection would probably be harmful. But if protection be good for one trade, why is it not for all trades? Let us take another of Mr. J. A. Reid's assertions. According to him, "Of one thing there can be no doubt. A vast amount of manufactured material is imported into this country which might very well be made here." Is it a necessary consequence, in Mr. J. A. Reid's opinion, that an article should be made in this country because we can produce it with less labour than it can be made in the country from which it is imported? If so, he does not understand the principle underlying all foreign trade. But to return to the question of "price-cutting" and "the ring." Mr. J. A. Reid admits the possibility of his being wrong as to its advantage to the consumer. Then why presume to favour such a policy? Surely the dealer who wishes to sell at low prices and the public who wish to buy can settle this question without the intervention of other people. If the dealer serves a useful function he will survive, but if his profits are too small he will give up the enterprise. This leads me to the letter from Mr. Wilfred Emery, to whom I may reply at the same time.

Mr. Emery is amused by my ignorance of the subject. He has arrived at the conclusion that dealers' profits are paltry—probably from personal experience and his familiarity with butchers, bakers, and candlestick-makers. I have before me the catalogue of a photographic dealer, who offers to the trade discounts ranging from 10 to 33 1-3 per cent. Such discounts still leave him sufficient margin of profit, obtained by the larger discounts given by manufacturers, to enable him to carry on a prosperous business. Excepting in certain cases, where he must have the stock to attract the public, the photographic dealer will scarcely look at a manufacturer's goods unless he can have at least 35 per cent. discount. There are many men who would be glad to supply the public on more reasonable terms than the present list prices. Mr. Emery's advice to photographers is amusing. "The dealers' fragile and perishable stock" suddenly assumes another character, and may be kept for "months, if not years." The photographer should buy his material as he does his "coals" (an entertaining simile). Should he buy his lenses and cameras in a like manner? But why incur such unnecessary outlay of capital to oblige Mr. Emery, or any small dealer clamouring for protection? Let Mr. Emery set a good example by following his own advice. If he can-

not make his way as a dealer without coercive restrictions upon trade, let him buy the broom and sweep the crossing. Doubtless the professional photographer would give him every consideration in his new vocation.—I am, yours, &c., ANTI-COERCION.

[With reference to our foot-note to "Anti-Coercion's" letter in the JOURNAL of June 14, in which we stated that we had received information on excellent authority that the Association of Manufacturers of Plates, Films, and Papers was practically non-existent: we have referred the matter to our informant, from whom we learn that we were unintentionally misled in the matter. We regret that considerable inconvenience has been caused to a number of well-known firms by the publication of our remarks: so far from being practically non-existent, the membership of the association, we learn, still includes the principal firms of manufacturers. Succinctly put, the object of the association is to prevent price-cutting, and not to force up prices. Without some such agency it would be impossible on the one hand to maintain a remunerative trade in the staple products of photography, or on the other to give them such a degree of quality that they could compete in the world's markets. We are assured that the influence of the association has reacted favourably in both these directions. Photographic manufacturing has thus been saved from the fate of many industries which trace their decadence to the unreasonable cutting of prices, and this, again, has admitted of the preparation of sensitive products of such excellence that foreign competition is powerless to replace them in general favour. Obviously any agency which achieves such beneficial results is deserving of commendation. We shall probably refer more fully to the matter on a future occasion.—EDS. *B. J. P.*]

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—Thanks to your good offices and untiring energy, the P.P.A. starts on its course with a very hopeful outlook, and although its commencing numbers are ridiculously small in comparison to the vast army earning their daily bread at the profession, yet backed as it is by men of ability, men of energy, men who are willing to abandon their own pleasures in endeavouring to raise the profession to a more dignified position, I feel certain that the results of its working will be of lasting good and benefit to its members. But, sir, one thing should not be overlooked. The Association should work for its members, and members only. Better terms, more equitable rates for large buyers, and all the other good things set forth in the objects of the association—these benefits should not be granted to those who through mere idleness or want of thought—I dare not say poverty—refuse to become members of an Association which desires only the welfare of the fraternity. In conclusion, I trust that the country members will gather in good numbers at the meeting, and thus show a practical interest in the doings of the Committee.—Again thanking you, I am, yours, &c.,

62, Shaw-heath, Stockport, June 24, 1901. A. G. LEWIS.

THE LATE GEORGE SHADBOLT.

To the EDITORS.

GENTLEMEN,—The pressing claims of an always increasing business have for some time prevented my satisfying by inquiry my doubts as to the continuance in "the land of the living," of the late George Shadbolt; but your issue of the 21st inst. has set those doubts at rest. I am sad to think, with deep regret, and with your permission I should like to bear testimony to my indebtedness to one towards whom I entertain sentiments of high respect and gratitude.

It was my privilege to make his acquaintance in the year 1856, and shortly after his assumption of the duties of editor of this JOURNAL, I was honoured with instructions to undertake the translations from the French journals, and to report the proceedings of the (then) three London photographic societies, and, as occasion offered, to contribute original articles.

I felt some hesitation as to my ability to discharge these duties, and, at the same time, give due attention to the claims of my daily business, and should not have undertaken them were it not for the cheering encouragement received from George Shadbolt.

There was a breezy freshness suggestive of open-air and light, in his manner, which made light of difficulties, and stimulated me not to "lose the good I might attain by fearing to attempt," and so we worked together with pleasure and profit during the seven years, from 1857 to 1864, and I am proud to think of the testimony which the pages of this JOURNAL, during that interval, bear to my efforts which but for the encouragement received from its genial editor might never have been put forth.

By his passing into the "Unseen," I feel that I have for a time lost sight of a valued friend, whose memory will always evoke feelings of gratitude, and of whom I think it may be most appropriately said—

"His life was gentle,
And the elements so mixed in him,
That nature might stand up
And say to all the world—This was a man."

I am, yours, &c., JAMES MARTIN.
General Photographic Works, New Southgate, N.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

H. J. Kaines, 3, St. James-street, Guernsey. *Four photographs of rough sea, Guernsey.*

S. Spurling, 83, Brisbane-street, Launceston, Tasmania. *Eight photographs of Tasmanian views.*

A. E. Beken, Blenheim House, Cowes, I.W. *Photograph of the funeral of Her late Majesty Queen Victoria.*

J. Smith, 4, Lansdown, Stroud, Gloucestershire. *Photograph of group of 2nd Gloucesters from South Africa.*

A. E. Ashley, 31, Grove-street, Retford. *Two photographs of the return of the Sherwood Rangers from South Africa.*

CARBON.—We fear we cannot help: as we believe the person you name has left the address given.

FERROTYPE.—W. BOYES.—All the accessories for working ferrotype can be obtained at Fallowfield's, Charing Cross-road.

THE KOMBI CAMERA.—COL. O'HARA writes: "Can you give us the name of the agent in England for the sale of the Kombi Camera?"—In reply: Perhaps some reader can say; we have lost trace of this camera.

PERMANENCE OF PLATINO-MATT PRINTS.—C. READ.—We see no reason why prints on "platino-matt" paper should be any more permanent than those on ordinary bromide paper; they are essentially the same thing.

A. WELLMORE.—From your description we do not know the style of picture you refer to. If you will send us an example, or give a more definite description, we have little doubt but that we shall be able to help you. It may possibly be an old idea under a new name.

FILMS.—"WILTS" writes asking "What rollable films are on the market other than the Kodak?"—In reply: The best known in this country are Wellington and Ward's, the Thornton, the Blair, and the Sandell. There are rumours of others being introduced from the Continent.

R. FRUGEN.—(1) The dyes may be obtained of Messrs. Penrose and Co., Farringdon-road, E.C. (2) Mr. Edgar Senior, of the Battersea Polytechnic will supply you with a photograph by the Lippmann process. Better write him. By "gratings" we presume you mean the taking and viewing screens.

THE GUM-BICHROMATE PROCESS.—"GUM" writes: "Can you give me any details of working or formulæ of the gum-bichromate process, and what book would be best for full instructions?"—In reply: Consult a little book on the subject by the late Mr. W. J. Warren; any dealer will procure a copy for you.

THE ALMANAC.—A. BRYANT writes: "As I am desirous of obtaining THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, should be glad if you would inform me of the price of same."—In reply: The ALMANAC is published in paper covers, price 1s.; and in cloth, 2s. The edition for 1901 is entirely out of print, but you might obtain a copy by advertising for it.

COPYRIGHT.—B. GRAHAM writes: "In November last you registered the copyright of a photograph of 'Flood at Cullercoats,' for me. I find a certain trade union has reproduced it in one of their reports, without leave or permission from me. I am trying to get hold of a copy, and if successful intend to go for them. As you did not send me anything which proves the copyright, will you please let me know whether you hold any paper from Stationers' Hall, in connexion with registration?"—In reply: A receipt is given for the registration fee, which is in the possession of our publishers. But it is not essential to the commencement of an action. You seem to have a clear case, and we recommend you to consult a respectable solicitor.

THE HALF-TONE PROCESS.—J. R. CROSSE writes: "I should be glad if you will recommend me a good firm upon whom I could rely to produce a few good photo blocks suitable for bill-heads and school prospectuses. I want good work at reasonable prices."—In reply: In the pages of the JOURNAL and the ALMANAC will be found the advertisements of several half-tone block makers. Better write one of them.

CARBON TISSUE.—F. W. DONISTHORPE writes: "Please tell me where I could get carbon tissue in three colours, ready for the three colour process."—In reply: We imagine that you will have to make the three tissues for yourself. Possibly, however, if you supply the three colours you require, the Autotype Company, Messrs. Elliott and Son, or Messrs. Eyre and Spottiswoode would make the tissue to your order.

PROCESS WANTED.—"VERT" asks: "Can you inform me of a process, other than carbon and the gum-bichromate, by which I can obtain an olive green tone? A process that will be easy to manipulate and practical, and will pay to work."—In reply: The carbon process, we should say, is the best and easiest to work, and, of course, it is a practical one, and one that will pay you. You might try the powder process, but you will find that more difficult to work.

SHADOWLESS PHOTOGRAPHY.—"AMSET" writes: "Not very long ago you published a description of a method of taking photographs of objects 'without shadows.' Can you give me the reference to the number of the JOURNAL in which it appeared?"—In reply: Can our corespondent oblige us with a nearer reference than "not very long ago?" We have spent a considerable time in trying to find the article, but without success.

THREE-COLOUR CARBON WORK.—"CHROM" writes: "Some time back I read, I think, that some one had proposed a carbon tissue made with different layers of colour, so that when it was printed upon with three suitable negatives, one after the other, a print could be developed in natural colours. Can you tell me if such a tissue has yet been put upon the market?"—In reply: No, it has not, and possibly never will be—at least with our present knowledge on the subject.

A QUESTION OF PERMANENCY.—G. KNOX puts the following query: "Which do you consider the most permanent prints, those made on P.O.P. or those made on bromide paper?"—In reply: This is a difficult question to answer. It is, however, generally considered that developed prints are more stable than those which are printed out. But a most important factor in the case is the care bestowed on their production. A carelessly produced bromide will probably show symptoms of change before a carefully made printed-out one will do, and vice versa.

THE PREVENTION OF FADING.—"FADING" writes: "I am assistant photographer, and hear that the firm's photographs fade if not covered under glass within a year. (1) How is this? (2) How can I remedy this? I use a first-class paper, and wash well for two to three hours."—In reply: (1) Simply because the prints are not properly fixed and washed. We should very much doubt if they would not fade, also, if they were put under glass, if they fade within a year without it. (2) The only remedy is to bestow more care and attention on the work.

PLATINUM TONING OF COLLODIO-CHLORIDE.—"OTHELLO" writes: "I have lately started using matt collodio-chloride paper, toned with platinum, but am troubled with a disagreeable bronzed appearance in the deepest shadows. Is there any remedy, or is it a defect of the paper? Were it not for this I like the paper very much."—In reply: Posibly the paper you are using has a strong tendency to bronze in the shadows when printing, and that is not removed in the toning. Try using less vigorous negatives, and if that does not answer try a paper that does not bronze so much in the printing.

PHOTOGRAPHIC PERIODICALS.—G. W. S. writes: "(1) I shall be much obliged if you will inform me through your columns what you consider about the two best American photographic periodicals, and the best way to obtain same regularly? (2) Also, would there be any difficulty in obtaining any particular back number of your JOURNAL for the past two or three years?"—In reply: (1) Wilson's "Photographic Magazine," and Anthony's "Photographic Bulletin," both published in New York. They may be ordered of Messrs. Dawbarn and Ward, Farringdon-avenue, E.C. (2) Let our publishers know the particular numbers you require.

COPYRIGHT.—"X. Y. Z." writes: "Twelve months ago I took three of the fellows who volunteered for the front, and gave them a few cabinets each, making no charge for the sitting or prints. I now find that Ogden's have been supplying prints copied from one of these. Have I any claim against Ogden's in this case? and, if I have, what course should you advise me to take? The photograph has not been registered. Is this necessary? and, if so, would it be sufficient to register it now?"—In reply: We fear you are too late. As the photograph was not registered at the date of the infringement, it is doubtful if you can recover. Of course, you can register now, but we would not give much for your chances of success in any action you might bring. Consult a solicitor conversant with the Copyright Act.

STUDIO-BUILDING.—"AN OLD READER" writes: "As I am thinking of building a new studio for branch business, I should be glad to know your opinions of the American style of building, viz., single-slant light. Do you think it more difficult to work? Preferable to the ordinary ridge roof structure? And producing as good results, or better?"—In reply: One form is as good as the other and equally as good results may be obtained in either. It is simply a matter of taste as to which is the best. As we have said many times before the excellence of the pictures is due more to the photographer than the form of a studio.

A COPYRIGHT QUESTION.—"HEMATITE" writes: "A. is the possessor of a cabinet photograph of a clergyman, now dead, the photograph was given to A. by the clergyman. Can B., the original photographer of the cabinet, prevent A. from selling copies of the photograph, or could B. prevent any other photographer from selling copies from A.'s photograph, if A. sanctioned him to do so? B. has lost the original negative."—In reply: If B. holds the copyright of the photograph he can proceed against A. for reproducing it; but if the clergyman paid for the sitting, then A. is free to copy the photograph and sell the copies.

POSING—PLATINUM PRINTING.—"OPERATOR" writes: (1) Is there any collection of portraits reproduced and published in a cheap form, which would give one new ideas or suggest anything in the art of posing? I get tired of my own particular way. If not, what would be the best periodical to take up? (2) How are those soft cloud-like effects obtained in small platinotype work which one is accustomed to see in the highest class work? Is each print done separately by hand, and by what method?"—In reply: (1) We know of no such collection. You will learn more by studying the works of the best photographers, and the pictures shown at the different exhibitions now open, than by any amount of reading. (2) They are taken with suitable backgrounds with the clouded effects, and, also, by judicious lighting so as to enhance or subdue the effect desired.

REPAIRS.—J. B. writes: "Three months ago I took my present studio on a seven years' lease, the landlord agreeing to paint it throughout, which he did. During the thunderstorm we had last week the rain came through the roof as through a riddle and stained some of the properties, a curtain, and quite spoilt two new backgrounds. The landlord denies any liability, but says he will bear half the expense of making the roof watertight, but will not contribute anything for the damage done. How do I stand with regard to the matter?"—In reply: If the landlord did not guarantee that he would make the roof watertight we fear you can do little. It was really your place to have seen that it was so in the first instance. Under the circumstances we should advise you to come to some mutual arrangement with him. If he is a reasonable man he will do so.

COLLODION TRANSFERS.—"COLLODION" writes: "Will you please tell me the method of affixing collodion transfers on jewellery, &c., also how to make the transfers?"—In reply: Collodion transfers are made by the wet collodion process by developing a transparency on a plate that has been waxed, and then a piece of moistened gelatine paper is squeegeed upon it. When the whole is dry the picture is stripped off. If the jewellery be coated with gelatine, containing a full quantity of chrome alum, and the transfer mounted on that face downward, it is possible that the paper may be removed by the careful application of tepid water. Another way would be, when the picture is developed and fixed, to put the plate into very dilute hydrofluoric acid, and float off the film on to the previously gelatined jewellery. This is but a brief outline of the work, as space will not allow of fuller details. These will be found in back volumes.

LENS QUERIES.—A. G. B. writes: "(1) Having a symmetrical anastigmatic lens of about six to six and a half inches equiv. focus, with the back lens used singly giving about double the length, I might wish for an intermediate focal length of about ten inches. This could be attained by shortening the focal length of the single back lens by employing a bi-convex lens, or by lengthening that of the combination by employing a bi-concave lens in front. The latter plan would be the most convenient, but would the resulting definition, &c., be equal in both cases? (2) Supposing an uncorrected bi-concave eyeglass of, say fifteen to sixteen inches, were inserted in front of the combination, would the spherical aberration with *f*-11, or *f*-16 be considerable over an angle of, say, thirty degrees, or the difference between visual and chemical foci amount to 1-40 of the resulting focal length of ten inches? (3) Would a bi-concave or plano-concave negative lens be the best? (4) Position—in lens hood as close to original lens as possible?"—In reply: (1) We should prefer to use the bi-concave lens. (2) Both would be quite negligible quantities. (3) As the lens will be so very shallow there will be, practically, no difference. (4) Yes.

NOTICE.

With the Journal of July 5, there will be issued a special portrait of Sir William J. Herschel, Bart., President of the Photographic Convention of the United Kingdom, Oxford, 1901. The negative has been taken by Miss Acland, who has kindly lent it for reproduction.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

he Right to the egative. The letter we recently published, written by Messrs. Debenham and nith, of Southampton, concerning the misuse, inadvertently ade we have the very best grounds for believing, of a negave sent to a firm of enlargers, is interesting from an interational point of view. The benefit to be derived from the hibition of a good specimen is a doubtful asset, when comared with the loss entailed by offending a customer. In is country the law is far more favourable to the photoapher than in Germany. Looked at from an English point view, the following case seems almost incredible. The mperor of Germany commanded a firm of photographers st year to take his portrait. The firm was granted the clusive right to reproduce the portrait by mechanical eans, and published it not only as a photograph, but so as a post-card. The name and address of the firm and e date were printed upon the photographs. As a further otection, a specimen post-card was registered under the w protecting the authorship of designs, &c. A firm in Leipsic inquired of the photographers upon what terms they could acquire the right to publish the portrait as a post-card. The photographers replied, that they had not the privilege of granting the right to other persons, and they had already published the portrait themselves and registered it. The Leipsic house thereupon published the portrait as a post-card without permission. The case was taken into court and decided in favour of the Leipsic firm. In Germany there is no copyright in photographs placed on industrial products, provided the goods are not thereby divested of the use for which they were primarily manufactured.

* * *

A New Shutter for High-speed Work. The possibilities of snap-shot photography seem to have been multiplied by a recent German invention. The "Photographisches Centralblatt" recently informed its readers that a patent had been granted for a new shutter of the focal plane type. We suppose there are few photographers who are not familiar with the principle of the focal plane shutter, in which a slit in a roller-blind passes across the plate, say in one-twenty-fifth second. If the width of the slit be one-twentieth of the length of the plate, the exposure will be one-five-hundredth second for each successive portion of the plate. In the new shutter the roller-blind is discarded in favour of two sliding panels, placed one in front of the other, running in grooves. Instead, however, of a single slit, each panel is provided with a series of slits at equal distances apart, so that the solid portions of the front panel cover the slits of the back panel when the shutter is closed. When the front panel is set in motion it exposes those portions of the plate left unprotected by the slits in the back panel, and as soon as it has moved the width of one slit, the second panel is set in motion in the same direction, and exposes the other portions of the plate through the slits in the front panel. The entire distances to be traversed by the panels need not exceed about a quarter of an inch, whatever the size of the plate. If we assume that the slit in a roller-blind shutter be of the same width as the slits in a shutter of the new pattern and the rate of motion equal in both cases, then the exposure for the entire plate will be as many times less, with the new

shutter, as the quotient of the length of the plate divided by the distance traversed by the two panels. It is a recognised fact that distortion may sometimes be perceptible when a focal plane shutter is used. The new shutter localises the distortion in sections throughout the plate, and it may possibly produce some curious effects.

* * *

Improved Printing from Plates. Dr. E. Albert, of Munich, has patented a process for an improvement in printing, of which the following particulars are gathered from the German Patent Specification. A "skeleton" is prepared corresponding to the shadows of the picture, and placed in position upon the back of the plate. Several sheets of paper are then placed upon the surfaces of the plate, and by means of the press a relief is given to those parts representing the shadows. A second "skeleton" is prepared corresponding to the high lights and placed upon the front of the plate, which is again passed through the press to give an opposite relief to the brighter parts. Zinc has the peculiar property of great ductility at as low a temperature as 100 degrees C., and, upon cooling, will retain the shape then imparted to it. It is thus specially adapted to the process of making ready the surface of a plate for printing, besides being the metal usually employed for photo-mechanical engraving. The object of the process, of course, is to enable the roller to supply more ink to the shadows and less to the high lights. The device is an old one and has been used by engravers, who made the surface of the block or plate of unequal height according to the light and shade of the picture. This is now done in the "making ready," and it remains to be seen whether the experience of the past, in the printing of engravings, will be found equally correct in photo-mechanical work. We do not see any novelty in the process beyond the fact of taking advantage of the peculiarities of a zinc plate at the comparatively low temperature of 100 degrees C.

* * *

Sacred Art and the Camera. The criticism we gave of Mr. Holland Day's attempts at sacred art has been confirmed in France. The following is taken from an article in "La Photographie Francaise," by M. Louis Bordat:—"In composition Mr. Holland Day shows a series of efforts of very uneven effect. The chief is a series of seven heads of Christ crucified, and should express the seven words on the cross—

I. Father, forgive them; for they know not what they do.

II. Verily I say unto thee, to-day shalt thou be with me in paradise.

III. Woman, behold thy son!

IV. My God, why hast thou forsaken me?

V. I thirst!

VI. Father, into thy hands I commend my spirit.

VII. It is finished.

The seven heads in question have expressions which do not disagree with the seven words, but they represent them without the requisite intensity, power, and elevation of feeling. They are wanting in nobility and have nothing divine about them. There is no doubt that the artist undertook a very difficult task, and his want of success is readily understood; but was there any compulsion in aiming so high? If photography claims to personify the grand figures which the most illustrious painters, sculptors, draughtsmen, and engravers have represented, it follows, of course, that it is for the purpose of achieving more, or at least quite as much as they have done. If it pretends to represent divinity, it is absolutely necessary that the work should be divine in character. Perhaps the artist may lack sufficient deep religious feeling. Perhaps the model was incapable of conveying with sufficient power and elevation the expressions that were sought. But in any case, the result is far below the level of the subject selected. In the last picture, 'It is finished,' the head of Christ literally bolts away into the frame. Why is this? A person very well disposed towards the exhibitors of the new school replied in answer to my question—'Why? Because it is finished. The subject vanishes with the last word.' The excessive indulgence displayed by the excuse dumbfounded me! Be this as it may, does it not recall the somewhat legendary picture of 'The Crossing of the Red Sea by the Egyptians in pursuit of the Israelites." There was no sea, because it had retired for the miraculous crossing. No Israelites, because they had already crossed. As for the Egyptians, they were coming. In fact, the canvas was bare, the sky in Egypt being so luminous that it is devoid of colour—a fact well known to all. Instead of showing a head of Christ vanishing from the frame, Mr. Holland Day might have left the frame empty."

* * *

The Size of Drops. We certainly hear less nowadays of so many drops of this, that, or the other chemical. The tendency is to more exactitude of formulæ, and we are glad to think that we have had much to do in the direction of inducing this better frame of mind in photographers. At the same time there are occasions where rigid exactitude is not needful, where drops may be employed with advantage. The objection is that no record can be made of experimental work when the term is employed, for not only do drops vary in size, according to the liquid made use of, but also according to the shape and size of the dropping vessel. And now we learn from a paper by MM. P. A. Guye and F. L. Perrot, the weight of a drop depends upon the time taken for its formation.

* * *

Chemical Action of Saliva. A very common plan of assisting the mounting of prints is to moisten them in parts by the tongue; indeed it may be within the memory of our readers that, some years ago, in a law-suit against a prominent firm of mount makers by a photographer, who found a large number of his pictures had faded after being placed upon certain mounts supplied by the defendants, it was given in evidence that the mounter had passed his tongue along many prints to make them lie properly. Whether this fact had anything to do with the fading was not raised at the trial, and ,in any event, the mount makers had to pay something towards the faded prints. Possibly some recent analyses of saliva, if then in existence, might have given a different colour to the termination of the case, for Herr Julius A. Grober describes, in a German technical journal, that thiocyanide of potassium is found in the human body; but in the saliva only. We could not offhand state that this well-known chemical in the small quantity necessarily present in the saliva would certainly be of ill-effect; but that a chemical that has once been recommended as a fixing agent should have a deleterious

fect is highly probable. We think it would be interesting know the ultimate constitution of the excretion from the igers; in other words, the liquid perspiration. Every one familiar with the red marks which will not tone when lver prints have been fingered before toning; usually this put down to greasiness of the finger-tips from the sub-itaneous glands, but it is worthy of question here also hether the real truth may not lie in another direction. Iost practical photographers are aware of the nullifying :tion of hypo upon the toning of albumenised paper prints the alkaline gold solution be contaminated with hypo: a rop of "fixing" solution in half a gallon of acetate bath ill utterly spoil it. May it not be that the perspiratory ecretion contains a small quantity of hypo, which exercises he inhibitory action hitherto credited to grease? Some olour is given to this idea by the fact that when the fingers ave been for some time in the toning solution (in contact ith gold and silver), and they happen to be touched with he tongue, a decidedly sweet taste is perceived, and it is nown that silver dissolved in hypo gives to the latter an ntense sweetness. These are mere guesses at truth, but hat they contain the germs of some facts of interest can-ot be doubted.

* * *

The Evolution of Oxygen from Chlorate of Potassium.

Why chlorate of potassium should so quickly give up its oxygen when heated with manganese oxide in the way so familiar to the old lanternists when pre-)aring their own gas has been a question of perennial in-erest to the scientific chemist, who knows how much greater s the heat required, and how much more irregularly the gas comes off, when the chlorate is used alone. Some new ight is thrown upon the matter by a paper (published in he July number of the Chemical Society's "Journal"))y Mr. Wm. H. Sodeau, on the "Supposed Mechanical Facilitation of the Decomposition of Chlorates." The con-:lusion he comes to, as the result of the number of experi-nents described, is that "he is of opinion that the supposed ibility of chemically inert solid particles to facilitate the lecomposition of potassium chlorate is unsupported by ex-)erimental evidence, and, if existing, is inadequate to ex-)lain even a small fraction of the great facilitation produced)y the oxides of manganese, iron, cobalt, nickel, and copper. The action of the latter substances now engaging his at-:ention would, therefore, appear to be entirely chemical."

* * *

Photographers and their Chemicals.

A case of some little interest to photographers is reported in the drug journals of last week. At Ripley, in Derbyshire, a chemist was charged, under the statute regulating such cases, with selling, "to the prejudice of one, Joseph Hewitt, four ounces of bicarbonate of soda for carbonate of soda." The person who, on behalf of the local inspector, made the purchase deposed that when he asked for carbonate of soda he expected to get it, but he did not know the difference. Mr. John White, F.I.C., the county analyst, seems to have had rather a heckling time of it in the witness-box, the upshot of which was that when he asked for carbonate of soda he would expect to get the pharmacopœdic preparation, soda carbonatis exsiccata! which for photographic, culinary, or even therapeutic purposes is a different thing altogether. The local authorities seem to have, in this case, got the wrong sow by the ear, and the case was very properly dismissed. Chemists deserve some sympathy in these matters; they have to hold the scales very evenly, and in the vast majority of sales know better than the customer what is required; a glance at the pharmacopæia shows us that nearly every drug has, besides its proper name, more than one synonym, and new names are constantly being devised by the public: when a lady asks her chemist for a pennyworth of "sal volatile" he might be quite justified in giving her carbonate of ammonium, but as a matter of fact she wants and gets an ammoniacal spirit nicely flavoured with lemon and nutmegs; our friend the chemist must be on his guard. As it happens, the photographer, in the matter of his chemicals, has little to fear in his dealings with his chemist; now and then, like the Derby inspector, he has been supplied with bichromate when he asked for carbonate of soda; apart from this his course is fairly clear; there are, however, two or three points which may be mentioned, and these are, when making a purchase of a chemical for a photographic purpose to have a clear idea of what the article is, and to state what it is intended for. It is not enough to assume that the chemist knows all about it; and, whenever possible, to select the chemical in the crystal form; to mention a few in common use, alum citric acid, the carbonate, sulphite, and biborate of soda (borax), and carbonate of ammonium; powdered, these chemicals are excellent for the use of the ordinary householder, but for the photographer they should be in the form of clear, clean, and bright crystals or lumps. This is particularly the case with respect to sodium sulphite; the average shop-stock of this chemical is, as we know by actual experience, not at all in suitable condition for the purpose required by the photographer.

ON THE EQUIVALENCE OF THE ALKALIES IN DEVELOPERS.

At the present time when new developers are continually being introduced, and there is a more intelligent use of them by photographers, it is not without interest to draw attention to the above subject, which is of practical importance to those who either wish to experiment for themselves or may have occasion to replace one alkali by another in a developing formula.

We have published in the Almanac for many years now tables by the late W. B. Bolton and Mr. G. E. Brown, both of which are obviously based upon the relative molecular weights of the compounds included, and this method has been followed by many writers on the chemical side, both here and on the continent, and the accuracy has been but rarely questioned In the current number of the "Photo. Revue," however, is an article by M. A. Le Mée in which he points out that this method is not correct, that we must take into account the heat disengaged in the reaction that takes place, and that the weight P of an alkali employed ought to be considered as a function of its molecular weight p and the heat c disengaged, and—

$$P = F(pc)$$

P and c vary evidently inversely.

If now we assume $P = np$ we can write

$$n = f(c) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

When c diminishes, n increases. We may consider n as representing the number of the molecules of alkali necessary for normal development. The greater the energy with which the alkaline molecules precipitate themselves on the molecules of hydrobromic acid set at liberty in the decomposition of the modified silver bromide, and the greater the distance between the molecules in consequence of their not being so numerous, the energy is measured directly by the heat disengaged in the reaction. The relation (1) ought to exist with the inverse power as indicated by n and by c, and it is probable if this is correct that the function f is simple, for example that n is inversely proportional to c.

As a matter of fact, if it is not possible to vigorously demonstrate this hypothesis, it is at least justified by the following argument.

The decomposition of silver bromide requires a certain amount of work. Light provides a certain amount of the necessary energy. The developer furnishes the rest.

Let c_1 be the work effected by two molecules KHO or the heat disengaged in the operation; let c_2 be the work effected by two molecules NaHO. The work done by $2m$ molecules of KHO will be mc_1, and the work by $2n$ molecules of NaHO will be nc_2; if the work effected is equal then we should have—

$$mc_1 = nc_2,$$

or

$$\frac{n}{m} = \frac{c_1}{c_2} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

If then we make up two developers with the same quantity of solution, the one containing $2m$KHO, and the other $2n$NaHO, equal volumes of these developers will have the same quantity of usable energy.

Moreover if p and q designate the number of molecules of anhydrous carbonate of potassium K_2CO_3 and carbonate of sodium Na_2CO_3 effecting the same amount of work, and c_3 and c_4 the heat disengaged when one molecule alone is used, we have the equations—

$$\frac{p}{m} = \frac{c_1}{c_2} \ldots\ldots\ldots (3) \qquad \frac{q}{m} = \frac{c_1}{c_4} \ldots\ldots\ldots (4)$$

We have then to determine the values of c_1, c_2, c_3 and c_4.

The reactions of development are as follows: assuming that the reducer acts by the subtraction of oxygen we have—

$$H_2O - O = 2H$$

The hydrogen attacks the silver bromide and gives hydrobromic acid and metallic silver:

$$2H + 2AgBr = 2HBr + 2Ag.$$

For a given reducer, such as hydroquinone for example, these equations are the same no matter what the alkali is that is used. We have not, then, to take this into consideration in treating of this question, but it is the final reaction which interests us.

The hydrobromic acid is absorbed by the alkali, and forms bromide:

$2HBr + 2KHO = 2KBr + 2H_2O + c$, calories .....(5)
$2HBr + 2NaHO = 2NaBr + 2H_2O + c_2$,, ...(6)
$2HBr + K_2CO_3 = 2KBr + CO_2 + H_2O + c_3$,, ...(7)
$2HBr + Na_2CO_3 = 2NaBr + CO_2 + H_2O + C_4$,, ...(8)

On reference to a work on thermo-chemistry and transcribing the heat of formation of hydrobromic acid, of potash, soda and the bromides of potash and soda and water, we find—

$$c_1 = 127{\cdot}2c \qquad c_2 = 177{\cdot}2c$$

To obtain c_3 and c_4, equation (7) may be synthetised:

$K_2CO_3 + 2H_2O = CO_2 + H_2O + 2KHO$ .....(7′)
$2HBr + 2KHO = 2KBr + 2H_2O$ .....(7″)

The reaction (7′) is identical with (5), the heat disengaged the same; to simplify (7′), that is to say to know the heat absorbed by the decomposition of carbonate of potassium by the vapour of water, or the heat disengaged in the formation of carbonate by the absorption of carbonic acid gas by a solution of potash, we find that the necessary quantity of heat is 20·4. We have then

$$c_3 = 127{\cdot}2 - 20{\cdot}4 = 106{\cdot}8c.$$

and

$$c_4 = 117{\cdot}2 - 20{\cdot}2 = 97c$$

We have then only to apply the formulæ (2), (3), and (4) and to note that $2KHO = 112$, $2NaHO = 80$, $K_2CO_3 = 138$ and $Na_2CO_3 = 106$, and we have:—

$$\frac{n}{m} = 1{\cdot}085 \qquad \frac{p}{m} = 1{\cdot}19 \qquad \frac{q}{m} = 1{\cdot}311$$

The weights of an alkali or alkaline salt which can replace 112 of potash are then:—

Soda (NaHO)	$80 \times 1{\cdot}085 = 86{\cdot}8$
Potassium carbonate	$138 \times 1{\cdot}191 = 164{\cdot}4$
Sodium carbonate	$106 \times 1{\cdot}311 = 139{\cdot}0$

In reducing these quantities to 1 of potash (KHO) we obtain the following table:—

Caustic Potash	Caustic Soda	Potassium Carbonate (anhydrous)	Sodium Carbonate (anhydrous)
1·000	0·775	1·468	1·241

When taking into consideration merely the equivalent weights we have:—

Caustic Potash	Caustic Soda	Potassium Carbonate (anhydrous)	Sodium Carbonate (anhydrous)
1·000	0·714	1·232	0·946

If the numbers of the first table are not absolutely correct we may affirm that they are much more so than those of the second, and working on these lines we can obtain a more extended table as follows:—

Caustic Potash	Caustic Soda	Potassium Carbonate (anhydrous)	Sodium Carbonate (anhydrous)
1·000	0·775	1·468	1·241
1·290	1·000	1·894	1·601
0·681	0·527	1·000	0·845
0·805	0 624	1·183	1·000

POINTS FOR CONSIDERATION BEFORE COMMENCING A PHOTOGRAPHIC BUSINESS.

THE number of communications we have lately received with reference to the construction of new studios, and most suitable lenses, cameras, &c., for beginners in portraiture would seem to indicate that professional photography is by no means on the decline, that is if the number still entering it can be taken as a criterion. But whether all will find the business a lucrative one is quite another matter—some find it very remunerative, others just the reverse. Those who contemplate entering the business for the first time, or those who propose opening new branches to their present businesses, will do well to read and digest the two articles that have recently appeared in our columns with reference to business methods in the United States. The first is by Mr. W. E. Ward, and the second by Mr. A. Lockett: see pp. 372 and 410 ante. From a perusal of them many useful hints may be gathered.

In this country one too often hears portraitists complaining that the business is bad, and so it unquestionably is with many. Yet we know of many houses that are doing a large and highly profitable trade. Probably those who have least cause of complaint, just now, are those who do the highest class work, and charge the highest prices for it, and, possibly, those who do the very cheapest and perhaps the worst kind of work. It is the middle-class—those who confine themselves to the "usual thing"—that seem to complain the most, and this brings us to the real point of the present article. Let us put the matter plainly by saying that the object of the professional photographer is to make money, as much of it as he can, and as quickly as possible. Then comes the question, how is that best to be done?

At the present time there are in London some few who are making money rapidly, but they, mostly, make a speciality of some particular style of picture, and do no other, and confine their printing methods to the two permanent processes—platinum and carbon. They do not do the "usual thing," but keep entirely to the specialities they have laid themselves out for. Their number, however, is limited, and may, perhaps, be counted on the fingers. Now the point we would commend to the consideration of those about to start business for the first time, is this: Which, in their case, will prove the more remunerative, a small and select business with some particular speciality, and high prices, or a middle-class one of the usual everyday type?

Some establishments we have in our mind, make a minimum charge of three guineas for which a dozen pictures of about the cabinet size, or such as can be cut from a half-plate print, are given, and with them the appointment books are kept tolerably well filled from day to day. Now, supposing that only two sitters a day were taken at these prices alone—and much higher are charged for larger sizes—it would mean a turnover of nearly two thousand pounds a year. Now, if in another class establishment, the minimum charge was, say half-a-guinea for a dozen cabinet pictures it will be seen that it will require twelve sitters a day to bring about the same receipts. But that is not all, because there would be six times the work done, probably six times the number of resittings to be given, and, of course, six times the number of photographs to be supplied—which means a consumption of six times the material—for the money. Consequently, the profits on the latter turnover are nothing like those of the former. It goes without saying that in the former business the work must be of a high order of merit and that requires skilled and careful labour, which commands a higher wage than does that with the commoner class of work. But the increased cost in this direction is, after all, not a very serious item because fewer hands are required to turn out the small quantities of work.

The point for consideration on the part of those about to enter photography, professionally, is whether it will be the better for them to commence a high-class—or recherché—business, with some special style, and keep exclusively to it, or to start one of the usual type with what, at one time, was termed cutting prices, but are now looked upon as popular ones? Of course, it will be obvious that if a high price business be essayed the work issued must be of a correspondingly high order, or there will be but little prospect of success.

There are other points to be taken into consideration, namely, the initial cost of commencing the two classes of business. For the high-class one the locality selected, for it must be a good one, and the appointments of the studio and reception rooms must be in keeping, but they, as a rule, though good, are few and simple in character, and with no great show of specimens. With the lower-class business there must, now-a-days, be more display, and the premises must be located in a good business thoroughfare, where rents are necessarily high. So that when the questions of rent, cost of apparatus, and fittings are taken into consideration, the difference in expense in the two cases is not such a very important item after all.

Embarking in a high-class business, confined to one special and artistic style of picture—which in many instances would not appeal to the "common or garden" public—in a small country town would be a commercial mistake. In most of the larger towns, however, we should say there would be a good opportunity for such an one, just now, seeing that so many of the better class public, with artistic tastes are quite tired of the usual garish highly-glazed, everyday, cabinet portraits. Some photographers, we know, supply pictures of both classes, but the two are, so to speak, mixed up together among the specimens shown, so that the one destroys the character of the other. In the very successful establishments we have in our mind, and which suggested this article, the ordinary type of everyday photograph is totally ignored and none exhibited in the reception-rooms.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

THE first annual meeting of this Association, which was founded in March last, was held at 66, Russell-square, by kind permission of the Council of the Royal Photographic Society, on Tuesday, July 2, Mr. Thomas Bedding, F.R.P.S., in the chair.

The Chairman said that it would be within the recollection of most of those present at the meeting that on March 28, at the preliminary meeting held at Anderton's Hotel, a provisional committee was appointed for a period of three months, to whom was entrusted the task of drawing up a report for submission to the first or inaugural meeting of the new Association. He proposed to present that report himself, *viva voce*, and after its adoption to ask the meeting to proceed to the election of officers and committee for the first year of the Association's existence. Since the meeting at Anderton's Hotel, several meetings of the provisional committee had been held and a sub-committee was, in turn, appointed to do certain

work. That sub-committee also had met several times and the result of the deliberations was the drawing up of the set of rules which had been circulated amongst the professional photographers of the whole of Great Britain and Ireland, so far as their names and addresses could be ascertained.

Of the nature of the response to the explanatory appeal to the profession, the meeting was, the chairman believed, well aware. At the present time the Association numbered 370 paid-up members, and support was still coming in. It was not requisite, he continued, to enlarge as on the former occasion, upon the necessity that existed for the new Association. That it was needed he thought was quite sufficiently evidenced by the excellent response that had been made to the committee's appeal. The response was remarkable in more than one sense, because the time of year—the busy part of summer—was not a favourable one for agitations of any kind. Careful attention to the history of agitations would show that it was in the early spring or winter that the aggrieved Britisher sat down and wrote his complaints to the papers, and joined forces with his fellow-sufferers. He therefore regarded that magnificent number of three hundred and seventy determined men as the finest possible manifestation one could wish for, of the need of such a body as the Professional Photographers' Association.

An expectation that he, as Chairman, had put before the gathering at Anderton's Hotel, had not been realised to the extent that was anticipated and thought probable. This was that a sufficient number of members would combine at the outset to enable the Association to be formed into a series of provincial centres. However, the Committee were hopeful that, as a result of this meeting and further effort, such a stage would shortly be reached.

There were one or two remarks that he thought it important to make as the Association made its entry into public life. He had before him a letter from Mr. Howard Farmer, the Principal of the Polytechnic School of Photography, acquainting him of the fact that the London Chamber of Commerce was arranging to give commercial certificates in photography next year, and for this purpose required its syllabus brought up to date. It was suggested that the Professional Photographers' Association should undertake to do that work and to appoint an examiner. The letter would necessarily come before the Committee to be elected that evening. The scheme was one that could not but be of the utmost benefit to the professional man. Another letter was in itself an eloquent appeal for the revival of the extinct Benevolent Association—a pitiful letter from the widow of a poor young professional man. He hoped that such a field of good work as offered in this direction would receive the best attention at the proper time. Yet another letter was upon the subject of fire insurance, and suggested that in good time the Professional Photographers' Association should include fire insurance for photographers as part of its work, and conduct the business of such an office. All of these suggestions seemed to point to possible methods of advancing the Association and enhancing its value as a help to its subscribers and members, and they would receive all the consideration they deserved.

To revert, however, to the beginning, the immediate casus belli between professional photographers and certain well-known advertising firms had passed away. It was to fight against such encroachments, to which detailed reference was unnecessary, that professional photographers banded together, but it was a fact that a great many of the gentlemen who agitated violently at the time, and expressed a desire to join the Association, had allowed their enthusiasm to evaporate. He hoped, however, as time went on, that they would come to realise that it was their duty to become members of the Association.

Mr. H. J. Whitlock (Birmingham) said he had pleasure in moving the adoption of the report and rules as circulated amongst the members. He was glad to find things promising so well and in such a satisfactory way. The fact that so large a number of supporters had been enrolled in so short a time was abundant evidence that the Association was a body that was very much needed. He was associated with the old and similar organization that came to an untimely end, and he attributed its decease to the want of interest that London men showed in its welfare. Such a trouble did not characterise the new Association, whose career seemed to him to be full promise.

Mr. T. C. Turner (London and Hull) was happy to second t adoption of the report and rules. Like other provincial photograph he was delighted to think that London men had awakened to a se of their responsibility in that important matter, the safeguard of t many and vital interests that the professional had at stake.

The motion for the adoption of the report and rules was carri unanimously.

Messrs. S. Herbert Fry and H. R. Barraud were appointed auditors of the Treasurer's accounts.

The report of the scrutineers of the ballot, Messrs. Dimberline a Ralph Robinson, was then announced, the following being declar elected as the Committee :—

Ten London Members.	*Ten Country Members.*
Harold Baker.	W. Barry (Hull).
F. A. Bridge.	T. Birtles (Warrington).
Ernest Elliott.	William Crooke (Edinburgh).
H. Hallier.	W. H. Midwinter (Bristol).
H. E. Hull.	G. W. Morgan (Aberdeen).
Martin Jacolette.	Gustav Mullens (Ryde).
Alexander Mackie.	Henry C. Spink (Brighton).
Lang Sims.	W. D. Valentine, J.P. (Dundee).
J. Caswall Smith.	H. J. Whitlock (Birmingham).
T. C. Turner.	G. W. Webster (Chester).

It was proposed by Mr. Jacolette, seconded by Mr. Ralph Robin son, and agreed to by acclamation, that the following be requested t continue in their respective offices :—*Hon Secretary*, Alfred Ellis *Hon. Treasurer*, W. Grove.

Mr. Ellis thanked the meeting for the confidence reposed in him and hoped that he should be able to perform something during th coming year that would be of real use to the Association.

As the mouthpiece of the Committee, he proceeded to touch upo the difficulty that presented itself respecting the President who according to the rules, must be a professional photographer. It wa considered very essential that such a rule should exist, but on th other hand the Committee regarded the Association as yet too youn to face a change of leadership. It was therefore his intention t move that for the next twelve months, that particular rule be se aside or disregarded in order to allow of the continuance in office o Mr. Thomas Bedding, who did not strictly come amongst them as professional. He therefore moved that Mr. Bedding be elected Presi dent for the ensuing year.

Mr. Coop seconded the motion, and the election was agreed t unanimously.

The following gentleman was nominated and elected as Vic President of the Association, Mr. H. Walter Barnett; the electio being agreed to unanimously.

Mr. W. Grove thanked the meeting for his re-election and pro ceeded to give a statement of the present financial position of th Association, which had a balance in hand of over 70*l.*, all expense being paid.

Mr. T. C. Turner, in the course of a general discussion, made th suggestion that all the articles that had appeared in this JOURNAL respecting the scope and flotation of the new Association should b reprinted in a concise form and circulated, as there were, undoubt edly, still many who were only vaguely acquainted with the object of the Association. A personal canvass was also a thing to b encouraged, and he hoped that those present would not omit t mention what was being done to all those in their immediate neigh bourhood who were still outside.

The Chairman said that all suggestions made to them would be fully considered by the Committee. He had just received a promise of access to a list of 6000 professional photographers in private hands, 2000 in excess of any list that was obtainable through ordinary channels. He was deeply thankful for this help and expected a fresh accession of members through its instrumentality.

Mr. Martin Jacolette thought that an intimation through the press, that the Secretary would be pleased to supply all particulars

photographers desiring information respecting the Association, ould be of eminent practical value.

Mr. H. E. Hull added his testimony to the urgent need that isted for a Benevolent Fund. He hoped that before long some nouncement might be made respecting the resuscitation of the old enevolent Society or the creation of another that should be inti-ately bound up with this Association's career. Mr. Percy S. ankester remarked upon the growing tendency to raise the remiums on fire insurance policies. Two years ago he was insured n an office for 800*l.* the premium being 2*l.* 12*s.* 6*d.*, but the premium vas suddenly put up to 4*l.* 10*s.* and there was no appeal. He was lad to say, however, that another office granted him an identical olicy for a premium of 1*l.* 10*s.* There was an urgent need for ne regulation of fire insurance rates, and the thing was one for this ssociation to attend to.

The Chairman pointed out that, although at present there was no ork for a solicitor, it was highly desirable that the Association hould be able to call for the advice of such an officer in legal natters. He therefore proposed the re-election of Mr. P. E. Marshall, who, he was glad to say, was willing to serve.

Votes of thanks were then severally passed to the Council of the Royal Photographic Society for their loan of the rooms, to the etiring provisional committee, to Mr. Ellis for his hospitality towards he provisional committee at the initial stages of their work, and to he scrutineers of the ballot.

Fifth List of Members of the Association.

Argall, Ernest Charles, High Cross, next door to the Post Office, Truro.
Ayton, George (Alexander Ayton), Shipquay Place, Londonderry.
Bailey, Alfred James, Pimlico Photographic Studio, 35A, Hendon-street, Pimlico, S.W.
Beckett, Jarratt Rudstone, Hendford, Yeovil, Somerset.
Chapman, Henry Alfred, J.P., 235, High-street, Swansea.
Cox, Samuel Busby, Westgate Studio, 56, Westgate, Peterborough.
Dimberlene, R., Photographic Artist, 75, Roman-road, London, E.
Dorrett, Harry Gordon (Dorrett & Martin), Athol Studios, 16, Belle Vue-road, Wandsworth Common, S.W.
England, Albert Edward, (Albert England), Triangle Studio, Station-road, New Barnet.
Frost, Robert, Artist and Photographer, 24, Baxter-gate, Loughborough.
Green, Henry (Vent & Co.), 67, High-street, Dudley, Worc.
Grut, Thomas Alfred, Photographic Artist, The Central Studio, 5, Pollet-street, Guernsey.
Gummery, A. H. (A. H. Gummery & Blackham), St. George's-square, Queen-street, Droitwich.
Hindley, Edward Ernest, 86, Talbot-road, Blackpool.
Holloway, Frederick, Photographer and Picture-frame Maker, North-street, Carshalton, Surrey.
Houghton, George Edwin, 55, Fort-road, Margate.
Langfier, Louis (Langfier, Ltd.), 23A, Old Bond-street.
Marsh, Fred, F.R.P.S. (Marsh Brothers), 7, Caxton-terrace, Henley-on-Thames.
Maxwell, Arthur, The Studio, South-street, Bishop's Stortford.
Mills, Fitzroy John (Mills & Palmer), 77, Fore-street, Ipswich, Suffolk.
Milner, Ernest, 67A, The Grove, Wandsworth, S.W.
Mitchell, William (Robert Clapperton), Meadow Cottage, Selkirk, N.B.
Powell, Samuel, High-street Studio, Rushden, R.S.O., Northamptonshire.
Simmons, A., Artist and Photographer, 258, Westminster Bridge-road, S.E.
Simpson, Frederick George (F. G. Simpson & Co.), 17, Wharf-road, Grantham.
Taylor, W. T., The Studio, Linlithgow, N.B.
Thomas, William Arthur, 45A, George-street, Hastings.
Walker, Cuthbert Archibald (Walker & Co.), 176, Upper-street, Islington, N.
Ward, Lorraine, Ward's Studio, 43, London-street, Reading.

The membership application form is again subjoined:—

To the Honorary Secretary,
Professional Photographers' Association,
51, *Baker-street, London, W.*

Please add my name to the list of members of the Professional Photographers' Association. I enclose the amount of my first year's subscription, 5*s.*

*Signature*_____
_____1901.

Please fill in the following particulars for Members' List:—

Full Christian and Surname _____
Full title of Firm or Company _____
Full Address_____

NEGATIVE AFTER-IMAGES AND COLOUR-VISION.

[Reprinted from "Nature."]

Four years ago I described an apparatus by which apparent transformations of colour could be produced ("Proc. Roy. Soc.," vol. lxi. p. 268; "Nature," vol. lvi. p. 128). The essential part of it is a disc, partly black and partly white, having an open sector at the junction of the black and white portions, as shown in fig. 1. If such a disc is

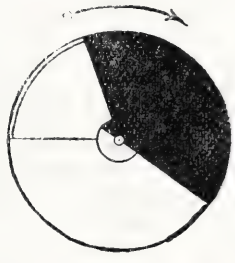


Fig. 1.

caused to turn five or six times in a second while its surface is strongly illuminated, a coloured object placed behind it and viewed intermittently through the opening gradually appears to assume an entirely different hue, more or less approximately complementary to the true colour of the object. A piece of red ribbon, for example, is seen as bluish-green and a green one as pink. The effect is due to the formation of negative after-images upon the white portion of the disc.

A number of observations made with this apparatus showed that the "pulsative after-images," as they may be called, differed in several important respects from the ordinary negative after-images seen upon a white ground after the gaze has been fixed for some time upon a coloured object. Among other things, they often appeared much more intense or saturated, which for obvious reasons was rather surprising. And again, it was found that the colours of the pulsative and of the ordinary after-images were sometimes very different. The pulsative after-images of red, of purple and of orange, for instance, were all of nearly the same bluish-green tint, and those of yellow and of blue were generally pink, showing considerable variations from the true complements. These and other anomalies led me to make some experiments with spectrum colours, which could be blended into uniform mixtures of known composition, instead of with pigments, the apparatus employed for the purpose being a simple form of Sir Wm. Abney's well-known "colour-patch" apparatus. The experiments, of which a short account is here given, are fully described in a paper recently communicated to the Royal Society ("Pro. Roy. Soc.," May 23).

A short pure spectrum, some three or four inches long, is projected, by means of a spectroscope collimator, a prism and an achromatic lens, upon an arrangement known as a "slit-screen." This consists of a wooden board having an oblong window over which slide three brass slit-frames carrying adjustable slits. The two outer slit-frames are attached to sliding shutters, which serve to cover such portions of the window right and left of the slit-frames as would otherwise be open to the light; the spaces between the middle slit-frame

and the two outer ones are closed by opaque black ribbons, constituting miniature spring-roller blinds. Each slit-frame can be moved independently to any desired position and clamped by a set-screw. When it is necessary to use larger portions of the spectrum than can be transmitted by the slits, the slit-frames and their appurtenances are removed from the screen and the spectrum is dealt with by means of one or more thin metal plates, which are inserted into a second pair of guides fixed on the other side of the screen. Each of these guides, has three parallel saw-cut grooves in it, so that plates sliding in different pairs of grooves may be made to overlap one another, and thus screens or openings of almost any desired width may be provided with very little trouble. The selected portions of the spectrum pass through the slits to a large lens, which projects upon a white screen the image of a circular aperture in a diaphragm placed just in front of the prism. This image, which is 1½ or 2 cm. in diameter, constitutes the colour-patch; it is illuminated by a uniform mixture of the spectrum-rays transmitted by the slit-screen. When the wave-lengths of the light are to be determined a screen of ground glass is put in the place of the opaque white screen and the slit of a spectroscope is brought near the bright image on the glass. To produce a bright ground upon which to see the after-images a beam of white light, derived from the same electric arc as the spectrum, is directed upon the screen. The white light passes through the aperture of an iris-diaphragm, and a lens is placed to project an image of the aperture upon the screen. The "white-light disc" so formed is concentric with the colour-patch, and in most cases of slightly greater diameter.

In the path of the two beams of light illuminating the colour-patch and the white-light disc is placed a zinc disc having two apertures, one near the centre to admit the spectrum-rays, the other near the circumference to admit the white light. This is caused to turn about five times in a second, and the apertures are so arranged that the sequence of phenomena produced upon the screen may be as follows:—The colour-patch is projected for about 1-40 second, then it is extinguished and immediately succeeded by the white-light disc; this remains for 5-40 second, and is followed by an interval of darkness lasting 1-10 second, after which the colour-patch reappears and the cycle begins again. The appearance presented to the eye when the true colour of the patch is green is that of a purple disc surrounded by an annulus of flickering white. Other colours, of course, produce pulsative images of different hues. It is sometimes better to view the pulsative image directly by means of an eye-piece instead of receiving it upon a screen; two or three methods by which this can be effected are described in the paper.

Perhaps the most interesting of the various effects observed with this apparatus is one which appears to throw some light upon the origin of the pulsative image and to show why the true colour is so completely lost. It was noticed that when the white-light disc was made a little smaller than the colour-patch, the pulsative image, which was in this case of the same size as the white-light disc, was surrounded by a dark ring. This observation led me to make what is called in the paper the "black spot" experiment. A circular piece of tin-foil was gummed to a glass plate which was placed behind the iris-diaphragm, a shapely defined black spot being thus formed in the middle of the white-light disc, as indicated in fig. 2, where the outer

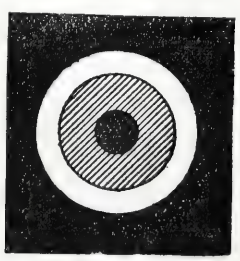


Fig. 2.

circle represents the white-light disc, the shaded circle the colour-patch, and the inner one the black spot upon the white-light disc. The diameter of the black spot was made, after several trials, 0.6 cm., or rather more than one-third of the diameter of the colour-patch. Suppose the colour-patch to be green. When the apparatus is worked, the patch becomes purple; the site of the black spot, being strongly illuminated five or six times in a second by green light, might be expected to appear green; but it remains perfectly black; no trace of a flicker of green light can be seen upon it. This induced blindness most conspicuous when the light is green or yellow; it does occur at all with extreme red or with violet light; nor does generally occur if the luminosity of the colour-patch is redu below a certain limit, that of the white-light disc remaining const A colour of feeble luminosity can be seen upon the black spot, w a brighter cannot, which is a paradox; and it was noticed that soon as the spot became distinctly coloured, the pulsative image alm disappeared. Absence of colour from the black spot is essential a good pulsative image.

It is clear that we have here an example of what I have called other papers a border effect; in certain cases light has the power exciting some action just outside the boundary of the image projec upon the retina. The black spot is, of course, merely a device exhibiting in a convenient manner a border effect which extends about half a degree beyond the white light impression. The experim proves conclusively that, under the given conditions, white li has the power of restraining the visual sense-organs adjacent to th upon which the white light actually falls from responding to the gr stimulus. This is of importance as indicating what occurs within area illuminated by white light, for it would seem to follow a fort that the sense-organs which are directly acted upon by the white li must be similarly incapacitated from evoking any green sensation. the formation of the pulsative image, then, it is not the fact, generally believed, that the green sensation is produced for a mom and then swamped by a more powerful white one so completely as escape notice; it actually never comes into existence at all. Nevert less, the effects of fatigue by green are exhibited, and the physica white ground is seen as purple.

Only one possible explanation of the phenomenon has yet occurred me. The facts can be accounted for in a perfectly simple manner we suppose, as postulated by the theory of Hering, that there is independent white sensation, and, further, that the latent period a colour sensation is very much greater than that for white. green, under the conditions of my experiments, the latent period wo be at least 1-40 second, while for white it can hardly exceed 1- second, though the luminosity of the two may be as nearly as possi equal. The latent period for red is probably not very different fr that for green under similar circumstances, while that for blue is c siderably greater.

If in a darkened room a ray of green light is admitted to the eye 1-40 second, one sees a flash of green; but, assuming that the s positions which have been put forward are correct, the visible fl is not contemporaneous with the physical illumination. One does begin to experience the green sensation until after the green ray wh excited it has been shut off. What is actually perceived is, in fact positive after-image, the duration of which may be considerably lon than that of the stimulus. But if a sufficiently luminous white s face is presented to the eye immediately upon the expiration of brief period of stimulation by green light, the after-image for will not be positive, but negative, and the only colour perceived be purple. The fatigue to which the negative image is due must h been set up during the latent period, when no image at all was actu perceived.

The formation of vivid pulsative images depends not only upon latent period, but also upon persistence, luminosity, the duration of primary impression and of the periods of light and darkness, and u other circumstances. And the conditions which are best for s colours are not so for others. This fact obviously suggests that pulsative image might afford a means of analysing compound colo sensations, though so far it has been found available only to a limi extent. If the complete spectrum is projected upon the screen, it seen at once that the blue-green pulsative image of the red, and purple pulsative image of the green, are far more intense than pulsative images of the yellow, the blue and the violet portions of spectrum. Accordingly, if we make an orange colour-patch by c bining red and yellow rays, it is not surprising to find that its pulsa image is blue-green, hardly differing at all from that of red, inst of sky-blue, which is the colour of the ordinary after-image of oran Now the pulsative image of a patch illuminated by the simple ora rays of the spectrum is also found to be blue-green; hence the in ence is clearly suggested that the spectral orange rays excite a sensation. This particular fact will probably be regarded as which needs no demonstration, but it is mentioned as an illustra of the proposed method of analysis. Several others in which

conclusions can be verified by trial might be given. Now it is noticed that under most ordinary conditions the purple pulsative image of green is more readily produced than that of any other colour. Under the same conditions we find that the pulsative images of yellow, of blue and of white are purple, and, assuming that the test referred to is a sound one, we conclude that yellow, blue and white all excite a green sensation. The proposed method of analysis may probably be carried much further than has yet been done.

This paper also contains an account of some new observations upon a class of phenomena to which I have drawn attention in a former communication ("Proc. Roy. Soc.," vol. lx. p. 368; "Nature," vol. lv. p. 367). If the image of a white object is suddenly formed upon the retina after a period of darkness, the object generally appears to be surrounded for about one-tenth of a second by a narrow red border. It was noticed that when the bright object producing the image was looked at through variously coloured glasses the red border did not appear unless the glass used was capable of transmitting red light, and it was suggested that the phenomenon was due to sympathetic excitation of the "red nerve-fibres" lying immediately outside the portion of the retina directly affected by the radiation. The orange and yellow glasses employed for the observations referred to, of course, transmitted red light. Using the pulsative image apparatus with the eye-piece method, I now find that the simple red, orange, and yellow rays of the spectrum, whether alone or in conjunction with any others, are competent to produce the red borders. The effect stops short at the beginning of the greenish-yellow. When blue and green rays are employed to illuminate the patch, either separately or in combination with each other, a blue-green border is produced. This is less intense than the red one before referred to, but if viewed in the manner described in the paper, the appearance of the green border due to pure spectral light blue of about $\lambda 4700$ is very striking. Violet produces no coloured border of the kind, and its admixture with other rays has no sensible effect upon the phenomenon. It can hardly be doubted that effects which occur, sympathetically as is suggested, just outside the boundary of the physical image, must also occur within the boundary; and if that is so, it follows that red, orange, and yellow rays, nearly up to the beginning of the greenish-yellow, excite a red sensation, while green and blue excite a green sensation. There is at present no evidence of the same kind as to the existence of any other fundamental colour-sensation, though there must, of course, be at least one more.

The bearing of these border experiments upon theories of colour-vision is indicated in the paper. The following is among the most important points referred to. It is found that a comparatively small proportion of red mixed with other spectral rays results in the formation of a red border. According to the Young-Helmholtz theory, green spectral rays excite the fundamental red sensation to about the same extent as orange-red rays; yet no red border is formed by the green, though that formed by the orange-red is very strong. The natural deduction is that no red sensation is excited by green light.

As regards a different point which has been much debated, certain observations seem to be absolutely conclusive. According to Helmholtz the phenomena of simultaneous contrast are due entirely to mental judgment; according to Hering their origin is a physiological one. Experiments with one of the eye-piece methods, in which the apparent diameter of the pulsative image is about one-fourth of that of the white-light disc or field of view, seem to place the matter beyond dispute. If a purple pulsative image is produced from a strongly illuminated green colour-patch, the whole of the physically white field surrounding the patch appears to be purple. It cannot possibly be be that the colour of the ground is a psychological effect resulting simply from contrast with green, for no green whatever is consciously perceived; the cause must necessarily be of a physiological nature. A similar effect is produced in an even more striking degree by blue and by violet colour-patches, the whole field appearing to be of the same hue as the pulsative images, namely orange and yellow. Phenomena of simultaneous contrast, as they are called, are therefore certainly not in all cases to be explained solely on psychological grounds.

The experiments which have been discussed establish nothing decisively in favour of either of the two principal theories of colour-vision. Some of the observations seem to support the Young-Helmholtz theory, others that of Hering; others, again, appear to indicate that neither theory in its present form is tenable. I venture to think that our knowledge of the subject might be materially increased by further experiments on the lines of those described.

SHELFORD BIDWELL.

THE PERSONAL ANALYSIS OF PICTURES.

Most people like looking over photographs. The popularity of the album is, and always has been, a proof of the fact. The old-fashioned album, it is true, is not so much in evidence on drawing-room tables as it once was. But taking into consideration the great number of books bearing such titles as, "Photos," "Scraps," "Views," and so on, that have come into comparatively recent existence, there must be, really, far more looking over photographs than there ever was in times when the classical album was alone in the field. The reasons for looking, too, are more varied. The album served more as a means of passing the time of waiting for tea, strengthening conversational weakness, or filling up its gaps. The type of subject, as well as the uniformly orthodox method of treating it, in the early days of the album pure and simple, cannot be regarded as having lent themselves to any breadth or variety of criticism. Almost exclusively portraits, with a wooden similarity of pose, and uniformity of severe background, effort and interest generally centred themselves in attempts at gauging character by the very few points accidentally offering themselves for the purpose. As the photographs, too, were generally those of blood relations and personal friends, it was wisest not to allow opinion too free an expression. Occasionally a happy shot would perhaps be made by asking if stingy Uncle Tom "did not look rather miserly," and the critic be duly elevated in estimation as a good judge of character. But as suggesting that kindly, but eccentric-looking, Aunt Eliza seemed "a queer old girl," would be received with chilling silence, or a curtly dry, "Do you think so?" it was best upon the whole to emulate the knowing parrot, who thought much but talked little. By this things have altered much. In portraiture alone, capable and intelligent amateurism has produced such a wealth of varied results, that it is possible to steer clear of hurting sentiment and feeling by an honest and frank expression of opinion, as well as get out of the awkward suggestiveness of silence, by criticising pose, lighting, accessories, style of printing, and so on. Nor are the pictures submitted for inspection and criticism confined to portraits. Photography has so many active votaries, and the opportunities of acquiring excellent and cheap prints by the less active are so numerous and easy, that the field has become immensely enlarged. There are river scenes, sea scenes, pictures of cathedrals, village streets, country functions, "studies" and "effects" of all sorts, lending themselves to interested criticism and discussion. Nothing is more interesting to a photographic worker than looking over prints anywhere. His opinion of the work varies, of course, with its quality, and his natural interest in its kind. Many of the pictures he does not think up to much, many are good, some very good. As a rule he probably thinks that given the opportunity and best working gear, he could do just as well. Very natural and human, and the fact goes far to prove that he is satisfied with a general impression, and does not analyse closely. It is a pity that he does not. If he did, he would more truly appreciate the difficulties met with and conquered in many a picture, and store up much knowledge that would prove of high value in the perfecting of his own work.

We are prepared to admit that, in the main, a man must pay for much of his experience by practical work, and failure. But there comes a time when, having realised the fact, he is prepared to pay a less price, and accept hints for his own benefit, that will keep him clear of paying, at any rate, the old full penalty of complete failure. Such hints are not likely to prove so beneficial if offered in too clear and easy a way. Most men, if given the opportunity of picking things up for themselves, will do so with more pleasure, and to greater benefit, than if pointed out to them in however masterly a fashion. Nothing pay, nothing value. There would be fewer nuts cracked if the shells were softer; and the relish of the pot that has been hunted for is keen and high. Further, as one man differs from another in so many things, and as whenever they differ there cannot but be a slight unconscious friction of feeling, the thoughts and feelings of the one cannot long be those of the other. This is the very simple reason for the fact that advice, and good advice, as the giver justly regards it, is rarely followed. It is ignored not from any "Old Adam" tendency because it is good, but because the receiving mind is so different to the giving one. A man would never dream of offering another a loan of his hat, nor recommend him to wear another because it happened to be the same size as his own. Yet he freely offers the use of the brains underneath the hat, and is surprised that they are not accepted, and their action embodied in work. Each must use his own brains in his own way. It applies in judging and analysing pictures as in everything else.

A good deal of picture criticism is high-falutin' rubbish, written in the orthodox jargon. Many an earnest soul, seeking after something of educative value and benefit to himself, makes himself uncomfortable by trying to like it, and bow to it, against his natural inclinations. Even when in print of accepted standing, and the square conviction of a capable critic, there is no necessity whatever for accepting it as something with which his own opinion must be made to exactly tally, if he would be quite right. It is rather absurd when one comes to figure it out. Take an instance to illustrate the point: a man, say, is intensely fond of the country. He cannot express in words why he is. Naturally he has a bias in that direction, and this has been strengthened by a long devotion to narrow road and straggling hedge, coppices that have not been laid out by rule and compass, trees that have not been planted by a corporation, and grass-land without a border to be kept off. A picture embodying some of these features is exhibited and criticised by the keen-witted man of the town asphalte, apt in his way of putting things, and clever with his pen. Why should the one lay the undue emphasis he frequently does upon the opinion of the other? Even though the capable critic be as fond of the country as he who we are supposing is reading his criticism, there is no reason why it should be accepted as something so definite and binding that there is no going beyond it. The two may know different kinds of country, and even though they be the same, there is the individuality of the observer to be taken into account. Two men looking at the same thing always see it in two, more or less, different ways. The only way out of the difficulty is for each to become his own critic. We do not mean to suggest that each one should constitute himself a judge in an ex cathedra fashion, get priggish over his judgments, and listen to, or read, nothing that any one else has to say. Some there are who are well worth reading when they discuss and explain broad principles of art, and show in special instances their happy application, or unfortunate ignoring. But such are not very numerous, and, broadly, it can be said of a picture, as of a book, that the more closely it is judged from a personal point of view, the greater the gain. A nervous feeling may arise, that the classical canons of art are not sufficiently well known. These are very real, and must not be ignored. But they are fewer and far less arbitrary than one would suppose, considering all the talking there is, and always has been, concerning them. Most likely, too, although he could not express them examination paper-wise, he who is in natural sympathy with the artistic has the feel of all the canons of art in him. He would not be more likely to transgress them in liking a picture in which they were violated, than a kindly heathen would be likely to break one of the Ten Commandments, even though he had never seen them in gilded glory above a chancel arch.

What is being driven at is, not only that there is no reason why a man should not be his own critic, but that he stands to gain by being, and in carefully analysing pictures from his own point of view, and for his own particular purpose. To be of highest value, however, it should be a close and systematic study, an analysis in short, and not merely a glance to determine whether he likes a picture or not. Why does he like or dislike? What is it that gives naturalness to a pose in a portrait? A sufficiency of detail in a mass of hair, that stops short of overdoing it,and detracting from interest in the face? Why should age be pleasingly expressed in the wrinkles of one aged face, and unpleasingly in those of another? What gives the feeling of space and air to one landscape, and a cramped, hedged-in one to the next? What is A's success in picturing water one wants to take a header into due to? B's in showing the church porch one thinks of on a hot summer's afternoon? C's in giving the homely air to the old farmhouse? And so on, in a thousand instances, a thousand instances in one's own particular direction, as far as that goes. It is only by close and persistent personal analysis that some of the causes of success will be gained, to be so remembered as to lead to a formulating desirable brightening up and enlarging of interest in life.

Prints, showcases, magazines, illustrated catalogues even, will now have an interest they were short of hitherto, and all tend to the desirable brightening up of, and enlarging of interest in, life, that is the desire of every rational man to accomplish.

An apology is offered for the rather diffuse way in which the foregoing has been put. It is, nevertheless, hoped that the majority of readers having probably something of straggliness of mind in common with the writer, it may appeal sympathetically, if not logically, to the end it is desired to serve. A policeman off duty, or an old sailor over a jug of ale, are not very logical in their conversations, but we have, spite of that, picked up many a scrap of information in listening to them, not to be found in the square-cut pages of a book, or heard from the severely formal rostrum of the lecture hall.

Our Editorial Table.

Half-tone Showcards.

Issued by the Thornton-Pickard Manufacturing Company, Altrincham.

The well-known company at Altrincham makes something of a departure by the issue of a number of large showcards printed in half-tone from photographic negatives. The subjects are fine examples of shutter work—a cat's head, a seashore study with figures, and the portrait of a pretty child at the tea-table; and the "cards," as such, are bound to catch the eye. They are sent free to all dealers. We are asked to draw attention to the Thornton-Pickard photographic competition, for which £105 in prizes will be awarded. The competition will be divided into three classes as follows:—Class I. £35 will be given in prizes for the best sets of four instantaneous photographs of subjects of general interest (taken with any of the Thornton-Pickard cameras and time and instantaneous shutters). Class II. £35 will be given in prizes for the best sets of four instantaneous photographs of quickly moving objects (taken with the Thornton-Pickard focal-plane shutter). Class III. £35 will be given in prizes for the best sets of four photographs of any subjects of general interest either "Instantaneous" or "Time Exposures" (taken with any of the various patterns of the Thornton-Pickard shutters, except "Focal Plane"). Entry forms for this competition will be supplied on application.

Paget Prize Self-toning Paper.

Manufactured by the Paget Prize Plate Company, Watford.

The process of toning, with the photographer of average ability, has always been a somewhat uncertain one as regards the results produced, and even in the hands of the most skilful the operation is a troublesome one. The introduction, therefore, of a paper that will give finished prints minus the operation of toning equal to those produced in the ordinary way is greatly to be desired. The Paget self-toning paper is a collodion paper which prints out in the same manner as ordinary P.O.P., and the method of treating it is practically the same, except that it does not require a toning-bath, either separate or as a combined toning and fixing bath. It is stated that the necessary gold is introduced in the manufacture of the paper. The instructions for use, which accompany the paper, are:—Print a little deeper than finished print is required (about the same as for P.O.P.) To obtain a warm brown tone, wash print in running water, or several changes, for five minutes, then place in fixing bath (hypo. 2 ozs., water 1 pint) for fifteen minutes; wash thoroughly and dry. If a colder tone (bluish-purple) be desired, instead of first washing, place print in a solution of common salt in water, about 2 ounces to the pint, for ten minutes, then rinse in water, and fix as above. The colour of the print cannot be judged while wet; its final tone is not arrived at until quite dry. Prints may be quickly dried in front of the fire, as they do not soften like gelatine.

We made a few prints with the sample of the paper sent us, and manipulated them precisely according to the instructions, part being simply washed and fixed, and part being treated with salt and water. When dry, those which had been simply washed and fixed were hardly cool enough in colour to suit the majority of tastes. Most photographers would say they were insufficiently toned. Those which had been treated to the salt bath were entirely different. The tone, however, could not possibly be described as "bluish-purple." It was really a warm purple-brown, and a very agreeable tint. Of course, there was not the slightest trace of double toning, and, but for the easily distinguishable difference between the surfaces of the two papers they would pass for first-class albumen prints.

Leitfaden der Landschafts-Photographie. By Fritz Loescher.

Published by Gustav Schmidt, Berlin.

Innumerable books have been published upon photography in its scientific aspects, and a considerable quantity of literature of doubtful value concerning artistic photography has also appeared from time to time, but comparatively few books have been written for the practical guidance of the amateur photographer. The present volume, by Fritz Loescher, is of this class, and gives very useful information concerning apparatus for different purposes and instructions how to use it and produce satisfactory prints. Some good illustrations of what to do and what to avoid are also distributed throughout the text. But whilst we acknowledge these good features of the work, there are

some points to which we take exception. We refer more particularly to the author's remarks concerning perspective. After describing the conditions under which objects are seen and the perpetual movement of the eye in its effort to grasp all the features of a landscape, notwithstanding the small angle of distinct vision, the author states that a picture should be delineated on the inner surface of a sphere to truly represent the subjective perspective of the eye. He seems to have overlooked the fact that the unnatural appearance of objects, depicted under a wide angle, disappears when the eye is rotated in their direction, at the point of sight. He assumes that the eye should be directed perpendicularly to the central vanishing point, but this is unnecessary, and if it be turned in any direction the objects which would otherwise appear distorted will assume their true form. The author's remarks concerning panoramic cameras are also rather misleading. He denounces them as being incapable of giving a satisfactory æsthetic picture, although of use for views. It is true that the angle of field may include nearly 180°, but it is wrong to suppose that any part of the picture is represented in perspective under an angle of 180°. The unnatural appearance is attributable to the pictures having been taken upon a curved surface, approximating to the author's interior of a sphere, and afterwards mounted on a flat surface. These points, however, are of minor importance with regard to the practical value of the work, which contains much sound advice for the guidance of the amateur, to whom we heartily recommend it.

Catalogue of Apparatus for Colour Photography, Orthochromatic Photography, and Photo-micrography.

Published by Messrs E. Sanger Shepherd & Co., 5, 6, and 7, Gray's Inn-passage, Red Lion-street, Holborn, London, W.C.

The beautiful process of colour photography which Mr. Sanger Shepherd has done so much to popularise is steadily gaining in favour, especially amongst lecturers, men of science, and others, with whom the advantage of projecting an image by transmitted light showing the hues of an original object is of immense importance. The catalogue before us, an elegant production, incidentally gives such a capital description of the stained film process of producing transparencies in scientifically correct colours that we commend the following quotation to those of our readers who may wish to make a practical acquaintance with this most striking and effective system. 'Three negatives (or colour records) are taken by the action of light of the three primary colour sensations, acting in accordance with their respective power to excite the human eye; from these negatives three coloured prints upon specially-prepared transparent media are produced, which, when mounted in superposition, exactly reproduce the object photographed. Naturally very extensive investigation and long series of expensive experiments were necessary to bring the process to its present state of perfection. The faithfulness of the colour reproduction entirely depends on the use of accurately adjusted colour filters and printing colours of exactly the correct absorption. Every little detail of procedure has been carefully considered, the material standardised, and devices provided to facilitate ease and accuracy in working. Every set of colour filters is adjusted by an improved form of Sir W. de W. Abney's colour sensitometer. Special instruments have been devised to ensure uniformity in the solutions and materials, and all the appliances used are accurately made to standard gauges in our own factory by the latest improvements in wood and metal working machinery. The colour record negatives may be secured in any ordinary camera fitted with a set of measured three-colour filters, preferably mounted in caps to slip on the hood of the lens, but we do not advise this method of working, on account of the loss of time and the difficulty of changing the dark slides without moving the camera. For lantern slides a repeating back outfit is recommended. This outfit is efficient for a very large range of subjects, including landscape, portraits, still life, flowers, paintings, tapestry, stained glass, copying, photo-micrography, polariscope work, &c. In order to make the coloured pictures, three colourless prints are made from the colour record negatives upon the plates and films we supply, the print from the red filter negative being stained to a cyan blue colour (or minus red), the print from the green filter negative to a pink colour (or minus green), and the print from the blue filter negative to a yellow colour (or minus blue), by dipping the respective prints in our minus red, minus green, and minus blue staining solutions. The three prints are then bound together in super-position to form the finished picture, with or without sealing in optical contact with Canada balsam. The slides can be shown in any ordinary lantern without addition or alteration. The importance of this fact from the lecturer's point of view cannot be over-estimated. So long as colour photography involved the use of special lanterns requiring much time and careful adjustment on each occasion they were used, the field of application was necessarily very limited, but now a lecturer can make slides from any of the subjects he wishes to project in their natural colours, and on arriving at the lecture-room can hand his box of slides to the lanternist without remark, with the certainty that his audience will not be irritated by dim pictures or faulty register. Brilliant pictures up to 12 ft. discs can be shown with the ordinary oxy-hydrogen limelight, or with the electric arc light up to 20 or 30 feet. Furthermore, the separate pictures may be viewed in the hand or the stereoscopic pictures in any ordinary stereoscope—either of the revolving or portable hand-form. There are no difficulties about registration, and no complicated delicate viewing apparatus to be constantly getting out of order; neither is it necessary to have a special lamp for viewing the pictures at night." The catalogue is a perfect guide to the practical requirements of the process; to projection work in connexion with it; to photo-micrography and orthochromatism; and it should be obtained by all those interested in these delightful branches of work.

News and Notes.

A select few of the employés of the Photochrom Co., Tunbridge Wells, had a very successful half-day outing and dinner last Saturday, 29th ult.

We have received the programme of a photographic excursion to the Dead Cities of the Zuyder Zee, N. Holland, to be personally conducted by William F. Slater, F.R.P.S., from August 10 to August 19. Copies may be obtained from Mr. Slater, at 5 Firs Parade, High-road, Lee, S.E.

The American Animated Photo Company, of 37a, Manchester-street, Liverpool, advise us that the premises named are now occupied by the company as dealers in everything pertaining to cinematograph work. The company have two dark rooms which they will at all times gladly place at the service of amateurs.

The Longest Day.—Mr. A. E. Smith writes: "There can be only one longest day, and it must be that day on which the summer solstice occurs; in other words, the day on which the sun approaches nearest to the North Pole. This year the sun reaches its highest point on June 22 (3.0 a.m.). Obviously this is the longest day, as the sun must be longest above the horizon. Next year, 1902, the sun will again be highest on June 22 (9.0 a.m.), and in 1903, still again on June 22 (3.0 p.m.), but in 1904, leap year puts in an extra day, and brings the summer solstice back to June 21 (9.0 p.m.). The longest day got one day forward last year (1900), owing to that year not being leap year."

Wedding of Miss Marsh.—Last week, at Bognor, Miss Georgina Marsh, eldest daughter of Mr. W. P. Marsh, the well-known photographer, of Marina, Waterloo-square, and a member of the Urban Council, was married to Mr. Lionel William Price-Evans, second son of Mr. Price Evans, dental surgeon, of Clarence House, Colebrook-terrace, Bognor, and Richmond House, South-street, Chichester. The bride wore a dress of white silk, handsomely trimmed with cream guipure lace, with wreath and veil, and carried a shower bouquet. The bridesmaids were the Misses Blanche Marsh (sister of the bride) and Dorothy and Eileen Price-Evans (sisters of the bridegroom), who were attired in pale blue, Sicilian silk dresses, trimmed with string-colour guipure, relieved with black and wore black chiffon picture hats. Each also wore a gold curb chain bracelet, the gift of the bridegroom, and carried shower bouquets of crimson roses. Mr. Donald Price-Evans acted as best man. The service was conducted by the Rev. Price-Evans, brother of the bridegroom, assisted by the Rev. A. T. Gill. The mother of the bride wore a smartly-made gown of fawn cloth, with turquoise crepe de chine waistcoat, and black picture hat. A reception was held at "Marina," and the happy couple left later in the afternoon for Tunbridge Wells, where the honeymoon is being spent. The fishermen marked the event by displaying bunting on flag poles erected on each side of the pier, and also by decking their boats. The presents were numerous and costly. The many photographic friends of Mr. and Mrs. Marsh and their daughter will, no doubt, join us in tendering congratulations.

"The Tatler."—In the course of an interview regarding his new journalistic venture, Mr. Clement Shorter states that—"In 'The Tatler' there will be an illustrated record of what is being played at the theatres. Every piece that is worthy of it will be illustrated in our pages, in the shape of a sequence of photographs of the actors, &c. I think the public like to know something about the actor who is entertaining them, something about the parts he has played, something about his career if he has had an interesting one. It is on the same lines that I purpose carrying on the literary section. The camera has done much, but we cannot get on without the artist, the really clever man, I mean. One must have artists to do big effects. Take a scene like the Derby. What photograph will give the requisite verve, the true spirit of the situation? No; the camera is all very well for portraiture or snap-shots, but we must have black-and-white work for bold and realistic pictures. On the other hand, the public much prefer a photograph of a man or woman to a picture-portrait. I can recall a picture of Lord Roberts which every artist praises, but the man in the street does not seem to appreciate it so much as he does the ordinary photographs. There are more readers nowadays than ever, and certainly, judging from the increasing circulation of 'The Sphere,' the demand for such papers is growing. This element of what I may term irresponsible illustrated journalism is my own creation. I remember the time when an artist sent me a beautiful artistic study of Mr. Albert Chevalier, but it was impossible to use it in the 'Illustrated London News.' The mere idea of a man, however talented he might be, who appeared at a music-hall having his portrait in that paper was too terrible to be considered. That is one of the germs of 'The Sketch.' But in 'The Tatler' we have gone much further."

Commercial & Legal Intelligence.

Messrs. Newton and Co., of 3, Fleet-street, London, E.C., inform us that they have been appointed opticians, &c., to His Majesty the King.

Messrs. Langfier, Limited, of 23a, Old Bond-street, London, W., have declared a dividend at the rate of 17½ per cent. per annum, for the year ending June 1, last.

Messrs. Morley and Cooper, of 70, Upper-street, N., sends us a catalogue of new and second-hand cameras, hand cameras, lenses, general photographic apparatus and sundries. The list comprises the whole of the stock, which is on sale for a short time only. The sale hours are ten till seven o'clock.

Amateur Photographic Competitions.—A Charge of Fraud.—At Bow-street, last week, before Mr. de Rutzen, Allie Amie, 27, of Beauchamp-place, South Kensington, was charged on a warrant, with attempting to obtain 10s. 6d. by fraud, from Messrs. George Newnes (Limited). Mr. R. J. Drake appeared to prosecute, and stated that among the prosecutors' weekly publications was a paper called "The Lady's Field," in connexion with which a camera club was started last year, with the object of encouraging amateur photography. Prizes were offered for girls between fifteen and eighteen, and in one of the April competitions the first prize of half-a-guinea was awarded to "In an old garden," by Allie Amie—"aged 15¼; done entirely without assistance." Immediately this photograph was produced in the paper, however, a Miss Pilkington wrote to Messrs. Newnes stating that it was taken by her. As a result of this communication, the prize was withheld, and inquiries were made, which resulted in the discovery that the prisoner was the person who, some time back, established what was called "The Victorian Magazine," of which there were only one or two issues. In this magazine a photographic competition was advertised, and among the hundreds of photographs obtained in this way was the one sent by Miss Pilkington, with which prisoner had nearly succeeded in obtaining a prize from Messrs. Newnes. Evidence bearing out counsel's statement was given by Miss M. E. Brooke, secretary to Mrs. Macdonald, editress of "The Lady's Field," and by Miss K. D. Pilkington, of 192, Queen's-gate, South Kensington. The latter stated that the photograph in question was taken in the garden of Clifton Hall, Nottingham. It was awarded a certificate by the Victorian Society, but witness never received it. When arrested by Detective-Sergeant Stephens, who produced his warrant, the prisoner said, "You needn't bother about reading it: I know all about it. All these prizes are frauds; there are many others doing it besides me." Accused now pleaded guilty, and Mr. de Rutzen committed her for trial.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
8.....	Bradford Photo. Society	Excursion: Beck Foot. Leader, W. C. Ramshaw.
10.....	Ashton-under-Lyne.....	Meeting of Members *re* Annual Exhibition.
10.....	South London	Excursion: Athlone and Connemara.
11.....	Hull	Excursion: Burton Stather.
12.....	Croydon Microscopical	Photographic Conversational Meeting to discuss the question of the contribution of Photographs to the proposed Museum at Grange Wood.
13.....	Croydon Microscopical	Excursion: Charlton.
13.....	Hull	Excursion: Lincoln—Corporation Pier.
13.....	Thornton Heath	Excursion: Windsor.

ROYAL PHOTOGRAPHIC SOCIETY.

Technical Meeting, June 25,—Mr. Chapman Jones, F.I.C., F.C.S., Vice-President, in the chair.

Mr. T. Thorne Baker, F.R.P.S., read a paper upon

The Sensitive Compounds of the Chromium Family.

The author deals with the sensitiveness of a number of metals to light and with reference to the chromium compounds with potassium, sodium and ammonium of the dichromate type, thinks they may justly be placed second in importance to silver salts, as without them ordinary colloids would be insensitive to light. Further, as chromium chloride and uranium chloride are both reduced by light, it is only natural that the chlorides of tungsten and molybdenum should be affected. The salts of molybdenum are very sensitive to light, and seem after a brief inquiry to promise to be of as much value from the photographic point of view as silver itself. Just as potassium dichromate or other dichromate may be used to sensitise gelatine, it would seem possible for potassium (etc.) ditungstate, dimolybdate and diuranate to be employed. Certain difficulties present themselves, however, which the author duly referred to, chief amongst them being that of the preparation of the salts alluded to. For printing in molybdenum a method is suggusted of which the following is a brief description. The metal is treated with aqua regia and the mixture diluted and filtered. Gelatine allowed to soak in the filtrate, and the whole is heated till solution takes place. The mixture is then applied to paper and printing carried on until the required depth is attained. Fixing is done with a weak solution of acetic acid. It is difficult to gauge with fairness the practical value of the molybdenum compounds until something more is known about suitable developing agents for the salts.

Ordinary carbon tissue was impregnated with a dilute solution of ammonium molybdate treated with sulphuric acid to produce the di molybdate, but no image resulted, the reason being put down to the uncertainty as to the existence of any dimolybdate at all. Mr. Baker also discussed at some length the utility of the sensitive salts of uranium but neither in this or the other cases did he show any specimens, a fact which the chairman said was cause for regret. The latent image and the problem of its investigation was also the subject of a few remarks some details of an electrical theory being advanced.

In conclusion, Mr. Baker draws attention to tellurium and the sensitiveness to light of its chloride. It gives an image, invisible by mere exposure but developable by means of potassium ferricyanide that is of a blue colour. Its toning powers, however, more particularly interest the lecturer who got with it what he calls "very beautiful brown and sepia tones" on bromide prints, the permanence of which he sees no reason to question. The toning solution is made by dissolving the metallic tellurium in a mixture of hydrochloric acid and nitric acid and diluting with water.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 27,—Mr. A. Haddon in the chair.

The Hon. Secretary read the committee's annual report from which we gather the following particulars: The membership increase is a source of much gratification to the Association, a record at least for recent years having been attained. The meetings have also been very well attended an average having been reached that compares favourably with that of past years and those of other societies in London. Papers and lantern displays have maintained the usual level of interest, and the more technical evenings have been tampered by the third social supper which was also well attended. The library has grown and a new set of bookcases is rapidly filling. A printed catalogue is in course of preparation. The financial aspect of the Association's career is likewise gratifying to the committee, treasurer, and all concerned.

A motion for the adoption of the report and balance-sheet was proposed by Mr. E. J. Wall, seconded by Mr. E. Human, and carried unanimously.

The ballot for officers and committee for the ensuing year was then proceeded with, Messrs. P. Everitt and W. T. Wilkinson being nominated scrutineers of the ballot. The following is the result of the ballot:—Trustees, Messrs A. Haddon and T. E. Freshwater; curator and lanternist, Mr. S. Heskins; librarian, Mr. E. T. Wright; secretary and treasurer, Mr. Walter D. Welford; recorder, Mr. Featherstone; committee, Messrs. Robert Beckett, R. Poulter Drage, T. K. Grant, James E. Hodd, J. W. Hodges, R. J. Kindon, H. C. Rapson, J. S. Teape; delegates to the affiliation, Messrs. T. E. Freshwater and H. C. Rapson.

Vote of thanks was passed to the retiring officers and committee, the auditors, the scrutineers, and to The British Journal of Photography for its reports of the meetings.

Various notices of motion for the alteration of the rules were then formally proposed, seconded, and discussed. Eventually the rules were amended by the substitution of a clause specifying one black ball in three to exclude a candidate for election instead of one in five as before. The consideration of other notices of motion proceeding until a late hour, the annual meeting was adjourned for a week.

PHOTOGRAPHIC CLUB.

June 19, 1901,—Mr. F. A. Bridge in the chair.

The subject of the lighting of dark rooms and what constituted safe light was gone into at some length. Howard Farmer's bichromate lamp was mentioned as one giving for a certain degree of safety a very much greater volume of light than was obtainable with other forms. The discussion also brought out the fact that it was not an unusual thing to smoke while handling sensitive materials in the dark room.

Mr. A. Mackie thought that a yellow paper covering to the walls was useful in a dark room; but, on the other hand, it was contended that this was not necessary if the light admitted to the dark room were of a safe character. With isochromatic plates one would use far more light than was customary if means were contrived whereby only reflected light were employed. Of course, if one held the plate lovingly up to the lamp for examination, the consequences must be serious, though, as a matter of fact, a plate was far less sensitive when wet than when dry.

Mr. J. W. Mason said that he always looked through the glass with the film to the light, reasoning that by the time one had half developed the plate there was a greatly reduced risk of fogging from the front surface.

Croydon Camera Club.—A record excursion resulted on Saturday, 29th ult., when, under the leadership of Mr. Ben. E. Edwards, a party of 108 members and friends spent a delightful half-day on the Thames. Leaving Hampton Court about three p.m., the party having embarked upon the "Sunbury Belle," proceeded along some of the most picturesque reaches of the river to Chertsey Bridge, where tea was partaken of, and that time-honoured ceremony the "official group" duly recorded. The President (Mr. Hector Maclean, F.R.P.S.), at the request of Mr. Edwards, after tea said a few words of welcome to the visitors. He expressed some difficulty in being hilarious or property vivacious on men

ea—(laughter)—and wished that it had been possible to defer speaking until after supper. He was specially pleased to see that so many adies had favoured the Club with their society; much as he would like o dwell upon this, to him, fascinating subject, being one of the married men, he would refrain, it might get into the papers—(laughter)—he hould leave this subject to younger and unattached members. On these arge excursions many did not know of the numerous clever people who vere with them: he thought it a pity that one could not label the distinguished person. However, he would remind them to look out for he Frena, the Tella, the Platinotype, the photographic books, "Excursionst," and "The Oldest Plate in the World," who were represented by some f those who sat around. In bantering terms Mr. Maclean proceeded o explain that the Club had—in the estimation of some of its members—become so important that a few years ago it "chucked" the phoographic affiliation. Since then their progress had been so great that he nderstood there was now some idea of the R.P.S., and the Photographic onvention being affiliated to the Croydon Camera Club (loud laughter). Ir. Wood replied on behalf of the visitors, expressing their gratification. Ir. F. O. Bynoe spoke in feeling terms on the subject of "The Ladies," nd Mr. Dunmore responded in a speech which, although it produced oars of laughter, cannot be effectively summarised. Later on the "Perormers" were thanked and, finally, "The Conductor," Mr. Ben E. Edvards, whose name was received with ringing applause and full musical onours. Besides the pleasures of the camera, which were duly indulged n by those present, a capital programme of music and mirth was carried ut. Mr. Dunn was chief pianist, Madame and the Misses De Lisle made nelodious music with mandolines, piano, and voice. Several of their elections were encored, "The Venetian Love Song," being specially ell done. Others who carolled were the Misses Wratten, Damon, and Ioise, while Mr. Edwards sang an exceedingly breezy sailor ditty, with real half-a-gale accompaniment, which was very effective. One of the nost popular turns was that of Mr. Dunmore, who related what a certain niddle-aged lady of alcoholic inclination tried to "Tella" friend.

Hackney Photographic Society.—June 25, Mr. J. Hubert (late of Hackney) gave a paper and demonstration of his new electric smoke and dust-trapping flashlight invention. He showed a number of excellent photographs taken by it, and afterwards took a 15 by 12 negative of the members present, numbering about thirty, which was very successful, and could not be distinguished from good daylight work. Mr. Roder proposed a vote of thanks to Mr. Hubert, saying he well remembered Mr. Hubert as one of the founders of the Society, and whose demonstrations and lectures they always listened to with pleasure; that he had never seen anything better than this invention, which was so ably laid before them, and hoped soon to see it on the market. Mr. Gosling seconded the proposal, saying the feeling so well expressed by the former speaker left him little to say, that he fully concurred with what had been said, and it gave him pleasure to state how well they appreciated all his efforts. The President said that some members would remember Mr. Hubert being amongst them at an earlier date than he could, and having contributed not a little to their success. He wished him every prosperity in the future, and especially with this ably constructed and useful apparatus. The vote of thanks was carried unanimously and with great applause. Mr. Hubert briefly responding, thanked the President and the members, saying words could not express his deep emotion at the kind reception given, and the good things said of him. The following is an extract of the address:—"It is indeed strange that with the rapid strides the art and science of photography have made, so little attention has been bestowed upon artificial illumination. The amateur spends days and sometimes wastes pounds in money, and, in the effort, even pounds of flesh in the endeavour to photograph his friends at the very moment when, according to the contrariness of everything earthly, the lights are waning; and by that, of course, I do not insinuate that the light of intellect of the operator may happen to be obscure, but, at any rate, the necessary glow (which of necessity must pervade everything human) is wanting. I must claim your indulgence when I go back in thought to the happy times I have spent in your society in years gone by. Many here to-night are unknown to me and I to them, but those here surely continue to breath the spirit which was infused into the society so many years ago by the enthusiastic band of its founders, of whom I am proud to have been even the least. I still rejoice to have had the honour of having been one of the first vice-presidents during the opening years of your flourishing association, when such well-known and honoured men as Messrs. Fenton Jones, senior and junior, Mr. Wall, Doctors White, Kibler Roland, and Gerard Smith, Mr. Dean, and others contributed the nucleus of this—one of the best known societies in London. I felt it a duty then to remember this early and pleasant association when I thought I had anything worthy of its fame. I must ask you to forgive me when I place my aims at so high a level, but I venture to think what I bring before you to-night is a good thing, and I feel convinced that if I can manage to obtain your approval to-night I shall feel amply rewarded. I regret, indeed, not to be able to place the details at your free disposa ,lasl I have always been pleased to do in former times, but I cannot now afford to do so. Alas! the days of the wet plate process are over, when I often earned £10 or more in a few hours, and was able to finish work to that amount in a day. However, what has been a professional loss is the amateur's gain, and, indeed, I have no reason, or the faintest wish to regret this state of things, for has it not raised the status of photography? I have honestly endeavoured to profit by the change and move with the times, and I feel sure that I am a wiser and better man for it than I should otherwise have been. But enough of this—I have pulled through troublesome times, and if I see rocks still ahead I live to surmount them. Now, to proceed with my demonstration. I wish it to be distinctly understood that I do not claim to have invented the flashlight, the electrical discharge of an accumulator or a method of a special 'non-exploding explosive,' but I do assert that by dint of closely studying the subject, I have succeeded in combining all advantages, in the early study of which a certain gentleman patented a new flash-lamp, which the late editor of the 'Photographic News,' at a meeting of the Royal Photographic Society, where and when it was shown, described as having previously been exhibited by me. This had nothing to do with the present invention, but it made me think that for the future I might as well patent my own designs before others snatch them from my grasp when I could least afford it. But should I not have protected it myself, I doubt whether many (excepting those who imitate for gain) had the patience to make and repeat experiments which alone ensure unqualified success. It is also cheaper in the end to buy the apparatus, which will be on the market before the dull evenings arrive. There may be some who for purposes of their own try to minimise the importance of the subject, or can see nothing in it; but I am prepared to prove that there is a great deal in it, else why is the work which can be produced by it not achieved? The demonstration will prove that it is possible to do with my apparatus what would be utterly impossible without, for you know it would be futile to take a group with young children included in an ordinary room, and daylight, without driving every living thing out of it for fear of suffocation from smoke and dust; or the operator may perhape be (as already has happened) literally turned out by the master of the house, by order of the mistress thereof, on account of the sqoliation of her best antimasassars, curtains, carpets, &c. There is no need now to scorch the linin~ of my own or any one else's silk hat during the operation. The electrical part required much thought, and in which I may mention electricians generally could give me little or no help, as I had to perform innumerable experiments suitable only to my case. Of course, many of you know that it required a series of lamps to obtain daylight effects, and otherwise it would be easy to fire a single lamp, but the difficulty lies in instantly firing off any number simultaneously. I do not know whether my previous lamp (whereby I passed oxygen through) during the time of the ignition of the flash is known to you, but years ago I obtained very successful results by it with gas alone."

Patent News.

THE following applications for Patents were made between June 17 and June 22, 1901:—

KINEMATIC PHOTOGRAPHY.—No. 12,351. "Photographic Printing Apparatus especially suitable for Kinematic Photography." CARL WAGNER.

LANTERN MASKS.—No. 12,356. "Improvements in Lantern Masks and the like." ASHBY WALTER JOHNSON.

FOCUSSING.—No. 12,424. "Improvements in or relating to Focussing in Photographic Cameras." ARTHUR LEWIS ADAMS.

CAMERAS.—No. 12,512. "Improvements in or relating to Photographic Cameras." (Société Prieur & Dubois, France.) Complete specification. ALFRED JULIUS BOULT.

HAND CAMERAS.—No. 12,609. "Improvements relating to Hand Cameras." MARIA JANE BURNLEY SCOTT, commonly known as Mrs. ROSS SCOTT.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE USE OF FLASHLIGHT CARTRIDGES.

To the EDITORS.

GENTLEMEN,—We have pleasure in calling your attention to the enclosed report of the legal decision obtained as the result of our appeal in the case of McNair v. Kodak, Limited.

You will remember that in March last a jury at Liverpool awarded the plaintiff in this case £5 damages for injury to his hand, consequent upon the use of a flashlight cartridge.

This decision was so obviously against the weight of evidence that we appealed, with the satisfactory result that the verdict has been set aside, and judgment now given in our favour.

In view of the importance of this to all dealers in photographic material, we shall be glad if you will be good enough to find space for the publication of the decision.—We are, yours, &c.,

KODAK, LIMITED.

43, Clerkenwell-road, E.C., July 1, 1901.

McNAIR v. KODAK.

The rehearing of the action by Mr. McNair, an amateur photographer, against Kodak, Limited, took place before his Honour, Judge Collier, at the Liverpool County Court yesterday. The case first came before the Court in March last, when a jury awarded the plain-

tiff £5 damages for injury to his hand through the explosion of a photographic flashlight cartridge supplied by the defendants. The defendant company obtained a new trial on the ground that the verdict was against the weight of evidence, and that no negligence had been established. Yesterday, after hearing the arguments of counsel, his Honour gave judgment for the defendant company, and held that there had been no negligence on their part. Mr. Rigby Swift (instructed by Messrs. Grace, Smith, and Hood) appeared for the plaintiff, and Dr. Thomas (instructed by Mr. J. H. Glover) was counsel for the defendant company.

Since the receipt of the foregoing, Messrs. Kodak write:—With further reference to this case, concerning which we have already sent you legal report, we now have pleasure in enclosing copy of paragraph published in the "Liverpool Mercury," Thursday, June 26th, which includes a statement of the result of the case as affecting the trade.

THE PHOTOGRAPHIC FLASHLIGHT CARTRIDGE CASE.

In reference to this case, the issue of which we reported yesterday, Kodak, Limited, write to us:—"You say the plaintiff received 'injury to his hand through the explosion of a photographic flashlight cartridge.' As this is likely to convey a wrong impression to the public, we shall be greatly obliged if you will kindly correct. The circumstances are these: The plaintiff bought a flashlight cartridge, poured the contents on a small tray, and applied a light to it through the medium of a wax match. The natural result was that he got burnt through expecting a slow lingering flame instead of a flashlight. How he arrived at this conclusion, in spite of the indicative name 'flashlight,' we do not know. The result of the reversal of the verdict arrived at by the jury is that photographic dealers, chemists, and many others will now be able to sell various flashlight cartridges and powders without the fear of having claims made upon them for injuries arising from careless or negligent use."

PRICE CUTTING.

To the EDITORS.

GENTLEMEN,—I notice with pleasure your foot-note to the letter by "Anti-Coercion" in this week's BRITISH JOURNAL OF PHOTOGRAPHY, and the clear manner in which you state the case for your correspondent's terrible bogie, the Plate and Paper-makers' Association. It is a pity such an able (?) advocate of the professional photographer as "Anti-Coercion" does not sign his name to his epistles. One would like to know what weight to attach to his remarks. I can only add that most dealers, large or small, to my own knowledge, agree with what I have previously written.—I am, yours, &c.,

W. EMERY.

15, Anson-parade, Cricklewood, N.W., July 1, 1901.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I note that in your report of Mr. Farmer's paper on "The Optics of Trichromatic Photography," p. 365. he is credited with saying that my practice does not conform to my teaching, and that analysis screens made by "one who presumably supports" my teachings show "no evidence in their spectrum records in support of Ives, or to suggest the Maxwell curves."

In reply to this, I wish to state that my practice has always conformed very closely to my teachings in the matter of analysis, and as closely as practicable in the matter of synthesis, and that analysis substantially in accordance with the Maxwell curves and synthesis by approximately pure colours, which I have advocated and practised, has been proved by thorough comparative tests, to be of vital importance to ensure correct reproduction.

There can be no justification or excuse for the bold assertion that my practice is not in accordance with my teaching.

With respect to Hubl's opinions, I ask, What can be expected of one who so little understands the principles of colour vision as to assert that any three colours farthest apart in the chromatic circle may be taken as the primary or fundamental colours?

The reiterated statement that Maxwell, Du Hauron, and Hubl are in agreement I have already shown to be absolutely false.

The only way I can account for some of the strange inconsistencies in Mr. Farmer's statements and opinions with respect to analysis screens, is by assuming that he utterly fails to realise the important difference between the colour sensitiveness of the eye and that of photographic sensitive plates, and confuses spectroscopic tests and spectrographic tests. To illustrate how one might be misled by failure to make this distinction, I may mention the fact that the screen I now make to yield the most perfect approximation to the Maxwell red curve in the spectrographic test, employing a Cadett spectrum plate, appears to the untrained eye, in the spectroscope, to transmit the spectrum rays almost in accordance with Mr. Farmer's "chunk" at the red end of the spectrum; but the following facts must not be overlooked:—

1. With this screen and plate the photographic action is in accordance with Maxwell's red curve.

2. The eye is relatively more sensitive to red than the Cadett spectrum plate, and the viewing screen in the Kromskop is a much deeper and purer red than the taking screen, so that while only about 50 per cent. of the photographic action occurs in the red below $C\frac{1}{2}D$, the visual analysis is 95 per cent. of it by that red.

3. The same taking screen, used with an Edwards' isochromatic plate, would show the strongest action by the yellow instead of the orange-red rays, and with some other plates by the deep red instead of the orange-red or yellow.

4. The best screen that can be made to yield the Maxwell red curve on an Edwards' isochromatic plate is so very nearly a pure red to the eye that it would serve very well as a Kromskop viewing screen, the visual transmission being more than 90 per cent. red, while the photographic action on such a plate is very close to what a deep yellow screen would give on a cyanine plate, as strong in the yellow and yellow-green as in the red.

Similar observations will apply equally well to the green and blue screens.

Coming now to Mr. Farmer's own practice, I doubt very much if it is in accordance with his diagrams. His diagrams indicate precisely the same amount of action by the darkest violet rays as by the brghtest blue, and precisely the same amount by the deepest red as by the brightest orange. We have to assume, in accordance with such a diagram, either that there is an indefinite amount of action by the invisible rays beyond the ends of the visible spectrum, or else that from the fullest action there is an instantaneous drop to none at all just at the visible limits of the spectrum. Mr. Farmer has probably indicated, not the photographic values of his screens in connexion with a specific distribution of colour sensitiveness, but merely their transparency for spectrum rays, which is a very different thing. If so, he has not given us any analysis curves at all.

If Mr. Farmer's curves are intended for genuine photographic analysis curves, and he actually works to (or beyond) them, I am certain that I can make a water colour picture which, by his process, will be falsely rendered in every colour. On the other hand, I have reason to think that it would be impossible to make such a water colour picture that would not reproduce with substantial accuracy by my system as I have carried it out since 1888.—I am, yours, &c.,

Philadelphia, June 24, 1901. F. E. IVES.

COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I have read your remarks in your JOURNAL of the 21st inst. anent our discovery of colour photography, and I am glad to note that you desire to treat me and my collaborator, M. de Lubicz, fairly; for this many thanks. But, in the notice, you quote what the representative of the "Daily Mail" wrote upon the subject, after he interviewed me some weeks back. That gentleman wrote from memory, taking no notes during our conversation, and hence a few inaccuracies. Firstly, my collaborator is not a Frenchman; he is a Polish artist resident in Paris; but as I mentioned that our experiments had been so far carried on in that city, the error was a natural one. Secondly, the words, "He is most anxious to be out first, so as to get all the credit," sound as if it referred to myself. This is not the case, which stands thus: I am actually an artist by profession; photography has always been my hobby; and, above all, the question of colour photography. I have tried various experiments for some years, and, last year, while working in Paris, I met M. de Lubicz, a fellow-artist. We mutually discovered that we were working on the same lines, and agreed to work together. M. de Lubicz had made an important experiment some fifteen months ago, but had not followed it up for various reasons. However, after many trials, we returned to this experiment, and found it to be the key to the whole discovery. Therefore it is not I who wish to get all the credit, nor any of it for that matter, as I consider that the credit is mainly due to M. de Lubicz. I was the "guide, philosopher, and friend" who helped him to arrive at the practical truth.

I quite agreed with you that a great deal of nonsense has been talked in the lay press on the subject of colour photography, and it has usually resolved itself into some dodge for colouring photographic prints more or less skilfully by hand; still I think that Mr. Sanger Shepherd and others have made it clear that colour photography is a possibility. I do not wish to discount any previous invention, but I am sure that the "Lubicz" process—for want of a better name—is far in advance of anything that has previously been done for practical purposes.

M. de Lubicz is coming to London next week, when we shall continue

to work in my laboratory. It is not too much to say that we are quite confident of success, as we have already obtained good printing results, but it requires to be perfected. The print in question, which I will show you, certainly does resemble a pale water-colour drawing, although it is very obviously a photograph, but I do not say that all the results will necessarily be of the same type. I have neither the time nor the desire to go calling on editors with specimens of our work; every one of your readers who regards photography in its higher branches as something more than a mere commercial product will, I feel sure, enter into my feelings in this matter, as I feel confident that you will do yourself, after reading this letter. It is M. de Lubicz's distinct wish that he and I should be able to show several and better prints before laying them before the press and the public. Nevertheless, as I said that I would show you a print, if you did me the honour to call, I will not go back on my word, and I feel convinced that, even judging by this very rough and imperfect print, you would admit that a great advance has been made on anything previously done in colour photography.

The only reason why I ever wrote to the "Daily Mail" at all was because I saw a notice in that paper referring to Mr. Gurtner, of Berne, as the originator of colour photography, and announcing his forthcoming visit with specimens to London, and although our invention was not intended to be brought before the notice of the public for some weeks, I felt that in fairness to M. de Lubicz, who is absent, I ought to put in a word for him, proving that he had held the key to our discovery some time previous to the Gurtner discoveries.

I really must sincerely apologise for the length of this letter, but I am not a literary man, and I could not contrive to put all the facts into more concise form.—I am, yours, &c., MONTAGU BARSTOW.

2, Phillimore-terrace, Kensington, W., June 27, 1901.

THE OXFORD CONVENTION.

To the EDITORS.

GENTLEMEN,—For the information of members of Convention coming from London, I shall feel obliged if you will spare me a few lines.

There are twenty trains on week-days between Paddington and Oxford. The best are the 9.50, 1.45, 4.55, and 8. These cover the journey in about an hour and a quarter. The Sunday trains are all slow—8.40, 9.0, 11.45, 3.20, 7.0., 8.5, and 9.15. The fares are the same by all trains; ordinary return tickets are available for one month. Special trickets, at reduced fares, are issued on Friday or Saturday, to return up to the Tuesday following.

According to present arrangements, a number of members from the Continent will arrive in London on Sunday afternoon next, and will travel from Paddington by the 7.0 o'clock train, arriving at Oxford at 9.50.

There is a slight error in the hotel list at pages 52, 53 of the Convention Handbook. "The Castle" (near the station) should be among the temperance hotels, and the "Eastgate" (High-street) should not.

I shall be glad if, during the meeting, members will kindly address all letters on Convention matters to me at the Town Hall, Oxford.—I am, yours, &c., F. A. BRIDGE Hon. Sec. and Treasurer.

P.S.—A special excursion train will leave Paddington for Oxford this (Friday) evening, July 5, at 6.18; returning from Oxford, Wednesday, July 10, at 6.30 p.m., 7s. 6d.; returning Friday, July 12, at 5.45 p.m., 8s. 6d.

To the EDITORS.

GENTLEMEN,—We shall be glad if you can find space in your next issue to note that our representatives, Mr. J. M. Dickinson, will be in attendance at Oxford during Convention Week. His showrooms will be at the Roebuck Hotel, where a full selection of novelties and goods of interest to all photographers will be on view. Inspection is cordially invited.—We are, yours, &c., MARION AND Co.

22 and 23, Soho-square, London, W.C., June 28, 1901.

PHOTOGRAPHY AND THE CYCLE.

To the EDITORS.

GENTLEMEN,—Your article in a recent issue on "Photography and the Cycle," has prompted me to send you the enclosed cabinet print cut from a 12×10 view on Loch Tay. It shows myself and cycle, and gives an idea of how we did a four-days' tour in Scotland. The camera is a 12 ×10 McKellen, and we worked Wellington and Ward's film in spools. I determined on this occasion not to take any toy camera. So the outfit was split into four cases, and distributed among the party, who were non-photographic. The camera you will see on my bike. The roller slide formed the contents of another; a third the legs, and a fourth the lens, shutter, cloth, and a spare spool. Over forty exposures were made without a failure mechanically. I beg to send you a scrap print of Loch Katrine. I should like to give you a detailed account of our doings, which were often humorous, but time forbids.—I am, yours, &c., W. BARRY.

7 and 8, Park-street, Anlaby-road, Hull, June 25, 1901.

SHADOWLESS PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In your Answers to Correspondents column for the previous week, "Amset" asks, p. 416, for a reference to an article on "Shadowless Photography," which you say you are unable to find. Probably the article referred to is one by myself which you published in THE BRITISH JOURNAL ALMANAC for 1900, p. 747. There have been articles somewhat similar published, but none, so far as I know, having that title. If that article does not give your correspondent wants he wants, I shall be pleased to reply to him by letter.—I am, yours, &c., J. H. BALDOCK.

Overdale, St. Leonard's-road, Croydon.

STORING CARBON TISSUE.

To the EDITORS.

GENTLEMEN,—Referring to the letter of the Autotype Company in your issue of June 14th, it is comparatively easy to keep tissue in good condition for a considerable time. Last year I had zinc cylinders made 43 inches long, with a lid 3 inches deep. At the bottom I placed chloride of calcium in a thin muslin bag, and on the top another bag. Finally, a rubber band over the join of the lid. Although I have not made experiments as to its keeping power, I know that I have had tissue in the tin for at least sixteen weeks. This is a simple and convenient method for those who, like myself, cannot cut the tissue up until required, as the tin holds the complete roll.—I am, yours, &c., WALTER D. WELFORD.

Warwick Lodge, 166, Romford-road, E.

DEPTH.

To the EDITORS.

GENTLEMEN,—"Free Lance," in his comments on Mr. Coventry's letter, appears to overlook the fact that there are two quite different varieties of depth, the one distinguished as depth of field having no conjugate relationship to the one described by Mr. Coventry as depth of focus, but which is better described as depth of definition. The confounding of the two varieties, and the application of the term depth of focus to both, cause all the confusion. The two kinds of depth may be defined as follows:—

1. Assuming the distance from lens to plate to be fixed, and allowing a certain amount of permissible confusion in the image, depth of field limits the distances of the nearest and farthest objects in focus at one time. This depth of field is commonly described as depth of focus, but Miethe describes it as depth of distance. Mr. R. S. Cole prefers depth of field.

2. Assuming the distance from lens to object to be fixed, and again allowing a certain amount of permissible confusion, depth of definition limits the nearest and farthest distances of the plate from the lens. This kind of depth is described by both Mr. Coventry and Mr. R. S. Cole as depth of focus.

It is a common blunder to assume that the points limiting depth of definition are conjugates to those limiting depth of field, but the assumption is quite wrong, and this mistake has led to an extraordinary amount of confusion. From "Free Lance's" reference, the "front" and "back" focus, and to "conjugate foci," it would appear that he has fallen into the same error.

Many writers give, as formulæ for depth of field, nothing but the conjugate values of the distances representing depth of definition, and though the errors thus introduced are small in amount, they are none the less regrettable. Even in Mr. Dallmeyer's "Tele-photography" this mistake has been made on page 103, though correct depth of field formulæ are given on page 100. Comparison of the two sets of formulæ will show the lack of agreement, the necessary transpositions being made. The initial mistake is in formula 22 (page 103), which should be 100 af, not 100 af + f. The latter is only the conjugate value of the depth of definition when focussing on infinity; the former is the depth of field measured from the node of admission of the lens.

Mr. Cole has avoided this error in his "Photographic Optics," having carefully distinguished between depth of field and depth of definition or focus, but his table of distances is illustrative of another error. To the casual reader it will appear to give the distance of the nearest object in focus when focussing on infinity. It seems, however, to really give the maximum depth of field when focussing on the hyperfocal distance; a very different matter indeed. There are in existence a number of tables of depth which state neither the amount of confusion allowed, nor yet the distance in sharp focus, and are

therefore misleading, if not almost useless. Variations in these important factors giving quite different results, readers are apt to conclude that depth of field, according to Mr. A, is different to depth, according to Mr. B. To come back to the question of terms, seeing that depth of focus is applied to two quite different matters by different authorities, I have dropped it altogether in "A First Book of the Lens," and adopted the distinctive terms of depth of field and depth of definition, and, with all deference to "Free Lance," I think this is the best course to adopt.

It may be as well to point out that Mr. Dallmeyer's "front depth" and "back depth" have no connexion with "Free Lance's" "front" and "back" focus. The former refers to the front and back of the object in sharp focus; the latter, apparently, to the front and back of the lens.—I am, yours, &c.,

C. WELBORNE PIPER.

June 28, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

L. Varney, Bridge-street Studio, Buckingham. *Photograph of 1st Bucks Rifle Volunteers.*

T. Innes, 108, Wellington-road, Heaton Chapel. *Photograph of the Rev. W. H. Brayshaw.*

Mowll & Morrison, 45, Hardman-street, Liverpool. *Two photographs of groups of Liverpool Football Club.*

THE KOMBI CAMERA.—MR. O. WESTABY writes: "In answer to the query of Colonel O'Hara, in last week's JOURNAL, Messrs. G. Houghton and Son, of 89, High Holborn, W.C., are agents for the Kombi camera."

THE WIDEST ANGLE LENS.—"HORSHAM" writes: "I want to get the widest angled lens on the market for a 10 by 8 plate. Will you oblige by telling me whether I can do better than a Goerz lens?"—In reply: Both the Goerz and the Zeiss lens include a very wide angle and have a flat field.

OZOTYPE.—"OXON" says: "I have made several trials of the ozotype process, but, up to the present, I have been unable to get pictures with the same vigour, brightness, and transparency in the shadows that I get with the carbon process. Can you tell me why?"—In reply: We should advise you to write to the Ozotype Company, 1, Wellington-road, Kentish Town, they may probably be able to help you.

AGREEMENT FOR TERM.—"X. Y. Z." writes: "I have just made a three years' agreement with Mr. ———. The agreement is in writing, and signed by both of us, but it is not stamped. On my suggesting that it should be stamped, Mr ——— said that it was not at all necessary, as it was signed by us. Is it all right as it is?"—In reply: No. It is of no value whatever. Unless it is stamped it is not binding on either party.

ELECTROTYPING.—"ELECTRO" says: "I want to do some electrotyping on a photographic base. Can you tell me the best battery to use, and also give me some general information on electrotyping?"—In reply: The most convenient battery to use for the purpose is a Smee's battery, next that a Daniel's. Any of the cheap manuals on electrotyping will give you information on the subject. Space is too limited in this column to give such information as would be of any practical value to you.

ENLARGEMENT DISPUTE.—S. J. W. says: "I sent a negative to have a bromide enlargement made, telling the people to make the head four inches. When I received it I found that the head measured five and a half inches. I returned it, and they say that they will do me another for half-price, which I have declined to pay. As they had the money with the order I seem to be in their hands. Can I get the money back?"—In reply: Yes, as the order was wrongly executed, and the picture returned, you can sue for the amount in the County Court, and thus recover it.

GLASS POSITIVES.—G. R. writes: "I have been experimenting with the wet collodion process for glass positives. But I cannot get the collodion to keep on the plate. It always loosens on the plate in the bath, and sometimes comes quite off. Can you assist me as I should like to be able to work the process, for I have seen some good pictures that were done by it some years ago?"—In reply: The most probable causes of failure in this direction are—First, the glass not thoroughly clean; second, an unsuitable collodion—too horny; third, too much nitric acid in the bath. Get a reliable collodion to begin with, such as Mawson and Swan's positive collodion. If you are not successful with that write again.

UNPAID DEBTS.—B. D. writes: "Will you kindly advise me what to do with people that are not in a hurry to pay for photographs? Can I claim the amount charged, as I have taken a photograph some months ago, and the party being satisfied with the proofs, and finished photographs, also the price charged, and now they take no notice of the bill when sent in? Thanking you for your legal advise."—In reply: Summon them in the County Court for the amount due. This is the only legal thing that can be done. Possibly a polite note will obtain payment of the account.

QUESTION OF DEVELOPER.—"OPERATOR" says: "I am here as operator, and I have only been used to the hydroquinone developer with which I can get good negatives, but the master will not have that used. He will have me use pyro, with which I have had no experience, and cannot get good pictures. As I cannot, he says I do not understand my business. Can he compel me to work with pyro?"—In reply: Certainly he can, if he wishes, why not? He is your employer. If you cannot get good results with that developer we are inclined to the opinion of your employer, namely, that you do not understand your business.

STEREOSCOPIC PHOTOGRAPHY.—"STEREO" asks: "(1) What is considered the most suitable distance between the lenses (from centre to entre) for taking stereoscopic views? (2) Is there any rule (besides reversing) in trimming and mounting to get the full stereoscopic effect?"—In reply: (1) From two and three-quarters to three and a quarter inches, according to the distance of the nearest objects from the camera. (2) Yes, you will find a long article on "Stereoscopic Photography," by the Editor, in the ALMANAC for 1900. That will give you every information on the subject.

BROMIDE PRINTING.—"BROMIDE" writes: "Having some bromide paper, which has been spoilt by the accidental exposure to light, for use in the usual manner, I have been experimenting with it for printing-out purposes, and shall be obliged if you can inform me whether it is possible to obtain good prints in such a way? The two enclosed prints, numbered on back (1 and 2), were treated respectively, No. 1 to an ordinary hypo fixing bath, and No. 2 to a combined toning and fixing bath. They both have a hazy, washed-out appearance, and if there is any method of improving the appearance I shall be glad to hear of it."—In reply: Bromide prints are made for printing by development, and are not adapted for printing-out. As they contain no free silver you will not be able to get more vigour in the prints than there is in those sent.

LOST NEGATIVES.—"L. N." writes: "I sent a trade retoucher a batch of negatives to retouch. He acknowledges receiving same. They were not returned, so I wrote for them by the end of a week. He replied, saying they were posted to me two days before. But I have never received them. The matter has been thrashed out by the post-office authorities, but no notice of them could be found, although they were able to trace all parcels that have been posted to me from the same post-office for several days before and after the said lost one. Can I claim any recompense from the trade retoucher? He cannot prove posting them, or the G.P.O. would recompense me."—In reply: It is a custom of trade that in such a case as this the sender is not responsible for parcels lost in transit. We doubt if you will recover from the retoucher unless you can prove that the parcel was not posted, which, we fancy, will be as difficult to do as it is for him to prove it was posted.

LENS QUERY.—"ACETYLENE" writes: "(1) I do a lot of hand camera work and have a Wray's 5½ in. 5 by 4 R.R. in my camera. Should I get better results with a Ross-Goerz, or Ross-Zeiss Unar, and, if so, which of the two would be the better one? I want good definition all over the plate, as I frequently enlarge my hand camera negatives. (2) Also, is there any book published on acetylene and its uses? I feel sure if you gave an article on it in your paper it would be of very general interest, there are so many using it for lantern and enlarging purposes."—In reply: (1) Either of the lenses named have a flatter field and a larger aperture than the one you have, and they are free from astigmatism. The Unar has the larger aperture of the two, and, consequently, is the more rapid lens. (2) Not that we are aware of. Write to Messrs. Thorne and Hoddle and they will send you a prospectus of the apparatus they supply for photographic uses. We do not think an article on the subject would be of any interest to the general body of our readers, seeing that so much has been published during the past few years.

FLASHLIGHT PHOTOGRAPHY.—A. PERKOFF writes: "I have the probable order to photograph upwards of 1000 persons in a hall. Will you kindly inform me how to proceed with flashlight illumination; the quantity of powder, and how disposed, whether against the wall, or behind camera, &c.? I believe an arrangement on the top of steps is necessary—a something made for the purpose. Is that so? In exposing, is the cap or shutter left open, and the plate bare, and the flash make the exposure, and the going out cut off the exposure? Kindly explain the exposing. I propose using a Goerz wide-angle f-6.8. I presume that would do the work. What is the powder, and where bought?"—In reply: All will depend upon the size of the hall, and its shape. It will be well to have more than one light, of course, placed out of sight of the lens, so as to get even illumination. The cap should be removed just before the flash and replaced immediately after it. So far as exposure is concerned we can give no reliable information for, as we have just said, so much depends upon circumstances. The best practical advice we can give is for you to make one or two preliminary experiments the night before, so as to avoid risk of failure. Magnesium powder, or a special flashlight powder sold by Fuerst Bros., 17, Philpot-lane, E.C.

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EX CATHEDRÂ.

Photography vancing or trograding as gards the rmanency of Results?

At no previous period in the history of photography have photographers had so many printing processes at their command, all of which are capable of yielding the finest results so far as present pearances are concerned. From the number of queries have to reply to in the Answers Column as to the cause stains, markings, and general fading within a few years, en months, sometimes even weeks, of their production, e above query not unnaturally occurs to one's mind. In word, are the silver prints made by the more modern ethods less permanent than those produced by the older es? such as those on the plain salted paper of old, deloped prints or enlargements on iodised paper, or those albumen paper. Thousands by these processes, done irty or forty years ago, are still intact, though many have ded. Thousands that have been done by modern prosses have gone within a very brief period, but is that due the processes themselves or to want of care in their proiction? We all know that if prints, by whatever process they are made, do not have proper care bestowed upon them in the manipulations, they cannot be expected to prove stable. But supposing the same care and skill are expended alike in modern processes and in the older ones, which will yield the more permanent pictures? The problem is not easy of solution, though it is, for the credit of photography, very desirable that it should be solved.

* * *

Summer Light.

The general fault with amateurs' negatives, particularly hand camera workers, is not, as a rule, over-exposure; more generally it is the reverse. We have, however, during the last few weeks been consulted by several who have got into difficulties, and the negatives, in every case, have shown that the failures have been due to over-exposure, and nothing else. Many amateurs, especially hand camera workers, will have the quickest plates procurable, and use them in season and out of season without due regard to the difference in the actinic quality of the light during summer, autumn, or winter, with the result that when the light is at its zenith, as it has been during the past few weeks, the negatives turn out over-exposed, a result that many novices have not met with before, and therefore are not well able to combat it in the development of the plates. We have always deprecated the use of the very extra rapid plates by novices, except perhaps for special purposes, such as when the light is bad, or a specially brief exposure has necessarily to be given. It should be borne in mind that an exposure that might be necessary with the most rapid plate in the winter will, at this season—especially if there are plenty of light fleecy clouds about—amply suffice with plates of the "ordinary" rapidity, while the results will be better generally. As we have frequently before pointed out, the more rapid the plate the greater will be the difficulty with the novice of getting the best results upon it. Experienced workers—such as professional photographers—seldom use plates of ultra rapidity when slower ones will fulfil their requirements. It is probable that the largest consumers of the most rapid plates that are made are amateurs, and more particularly novices. Experienced

amateurs, as a rule, avoid them during the summer months, except for very special purposes.

* * *

The Professional and Originality. Year by year the necessity of keeping pace with the times becomes more apparent in professional photography, and circumstances seem to point more strongly than ever to the desirability of wider cultivation of taste on the part of the photographer. The public has greater appreciation for art, and success lies in gratifying this desire for æsthetic expression. The future is in the hands of the photographer who has the attractive studio and satisfies the best taste of his clients. These remarks are suggested by some illustrations in the "Allgemeine Photographen Zeitung," of the enterprise of an Augsberg photographer, Herr Siemssen. Augsburg is a town of 75,000 to 80,000 inhabitants,and this must be taken into consideration in estimating the vigorous business enterprise of the photographer. Apparently the house and studio have been built specially after his own design. The external decoration is bold, not to say fantastic, and the internal decoration seems to have been planned throughout for novelty of effect. The studio closely resembles a well-furnished room. The entrance hall, office, reception and dressing rooms, as well as the other parts of the building, show individuality of style and the determination of the photographer to do his work by his own methods. Only three specimens of Herr Siemssen's photographs are given. Two are portraits of men showing much breadth of style, together with good posing. The third is a half-length photograph of a girl, which, but for a pleasing face, we should condemn as an eccentric extravagance. The design of the frame and the trimming of the print seem to have been dictated for the sole purpose of attracting attention. These are the methods of the advertiser, not the portraitist, and if the print is offered as a specimen of professional work we should award it more blame than we have praise to the other examples of Herr Siemssen's art. Our object, however, is rather to draw attention to the boldness and originality of Herr Siemssen's enterprise.

* * *

Jubilee of the Vienna Photographic Association. We have much pleasure in giving publicity to an announcement signed by Dr. J. M. Eder, as President, and Dr. Josef Székely, as Secretary, that a Photographic Exhibition will be held in November of this year to celebrate the fortieth anniversary of the foundation of the Vienna Photographic Association. The exhibition will be held at the Imperial Technical School (K.K. Graphische Lehr- und Versuchsanstalt, VII., Westbahnstrasse 25), by permission of the Minister of Education, and its object is to show the development of photography by contrasting its infancy with the mature work of the present day. It is hoped, by the sympathetic support of friends and members of the Association, to demonstrate the high position photography has taken in all its branches, including those graphic arts which are based upon it. An invitation is given to all to send specimens of photography dating from its earliest days, as well as such that represent the best varieties of modern work. The attention of exhibitors is directed to quality rather than quantity, so that it may be shown that photography is capable of artistic expression in representing beauty of form. The space occupied by each exhibitor must not exceed six square metres. No charge is made for space, but carriage both ways must be paid by the exhibitor. There will be a Committee of Selection, but no prizes will be awarded. Each exhibitor will, however, receive a diploma. Exhibitors residing within the limits of the Austro-Hungarian Customs are recommended to frame their pictures as they may think desirable, but as the Committee of the Association will frame any exhibit free of charge, foreign members are invited to send their pictures simply mounted, and not framed, in order to avoid Customs expenses. Entries may be made at once, or not later than September 20, at the office of the Photographische Gesellschaft, 7 Karmelitergasse, Vienna. Exhibits must not arrive later than October 20, and should be marked "Ausstellungsgegenstände." They should be sent to the "Photographische Ausstellung in den Räumen der K. K. Graphischen Lehr- und Versuchsanstalt, Wien, VII., Westbahnstrasse 25." The exhibition will be opened on November 6, and closed on December 6, 1901.

* * *

Another Giant Telescope. We see in a Continental paper that a rich American has offered to present the Pope with a telescope surpassing in size the giant telescope which was exhibited at the recent Paris Exhibition. It is reported that his Holiness has expressed his willingness to accept the gift, and has given instructions that the instrument shall be placed in a prominent position at the Vatican Observatory. Whether the instrument will render service to science commensurate with its cost depends largely upon its construction. It seems very doubtful, however, because there are difficulties in the way of casting exceptionally large discs of improved Jena glass. This may limit the choice of material, and render the use of the older varieties compulsory.

* * *

Tele-photography. Another sign of the rise in popularity of tele-photography was observable recently at a meeting of the Société Francaise de Photographie. A specimen of Bellieni's jumelle was shown with a tele-photo attachment. M. Bellieni's jumelle is a hand camera of the opera-glass type. The lenses with which it is fitted have a focus of $4\frac{1}{4}$ to $5\frac{1}{4}$ inches. A very light aluminium tube has been provided for adapting the instrument to its new work, and it is fitted with a specially calculated Zeiss negative lens, which enlarges the image five to six diameters. This is equivalent to the use of a lens of about 21 to 26 inches focus. The lens supplied with the camera is removed, screwed on the front of the aluminium tube, which in its turn is screwed in the flange on the front of the camera. The finder has also been adapted to give a corresponding image. We would draw attention to a fact of some importance with regard to small photographs taken with a tele-photo lens. The normal distance at which small photographs are usually looked at is about ten inches. To get the true effect of the perspective of the picture, it should be viewed at a distance from the eye corresponding to the focal length of the lens. This is an impossibility with short-focus lenses. When, however, the focal length is increased beyond ten inches the pictures have a much more

pleasing effect, and this is especially observable in portraits. With moderate magnification the exposure is not unduly prolonged.

* * *

Stolen Lenses. The loss of lenses is a serious item, and as the discouragement of dishonesty is a work in which all should co-operate, we draw attention to the fact that the following lenses have been stolen from the well-known firm of R. Lechner, 31 Graben, Vienna. It is not impossible they may find their way to this country, and any information supplied to the firm concerning them will be treated as confidential.

In black focussing mounts:

1 Voigtlander-Collinear II, *f*-5.4, 120 mm. focus, No. 66,106.
1 Goerz Double Anastigmat III, 120 mm. focus, No. 67,212.
1 Goerz Double Anastigmat III, 150 mm. focus, No. 67,619.

In ordinary brass mounts:

1 Suter Anastigmat I, 175 mm. focus, No. 21,737.
1 Zeiss-Satz Anastigmat, Series VIIa, No. 3.
285 mm. focus, No. 26,148.
183 mm. focus, No. 22,015.

In black hand camera mounts:

2 Antiplanets.

EMERGENCIES AND HOW TO MEET THEM.

Frilling.

From time to time we have in conversation with one or other of our readers heard of all kinds of mishaps, some through accident, some through carelessness, some very grave, some even droll, and all annoying. How these have been coped with, when suddenly presenting themselves, will form an occasional chapter interesting enough to many, though not necessarily embracing any special feature of novelty.

The subject of our present chapter has been forcibly brought to our notice quite lately by a well-known professional photographer who recently was by way of almost irreparably damaging some valuable negatives through a sudden and unexpected access of frilling. Those who are accustomed to working a particular plate, which is really the true way to success, will be apt to say that a plate liable to frill should be provided for, and that the disaster should not come as a surprise. In a general way the remark would be just, but in the first place a particular make of plate was used in the present instance, that proved to be especially liable to frill, and in the second place such an event as a batch of plates proving an exception to the average is not an unknown occurrence. The manufacture of plates has now, however, become almost like an exact science, and the once universal frill is rare. What we have now to deal with is the evil starting into existence suddenly and unexpectedly, and needing instant treatment if the exposure is to be saved. A plate passes through the developing solution all right, it fixes without change; but once the final washing is started frilling sets in. The insidious foe is first seen at the corner perhaps, and even while watching it, swelling and loosening of the film is seen to grow and extend. A few seconds of time wasted, and the possibility of remedy is lost. Much depends upon what there is at hand capable of arresting the evil—possibly nothing whatever. But even then there is no need for despair, for it will be found that if the plate be put back again into the fixing solution very little extension of the evil will take place. As we have before explained, the cause of the defect is that when hypo diffuses into water more than its own bulk of water takes its place, and so if the film be not very firmly adherent to the glass it will expand at some spot where the liquid can easily gain access between it and the glass, and once started the liquid continually gains ground, the loosened film expanding all the time, and producing the familiar frill. Hence when the plate is put back into the hypo the process of swelling is quickly arrested by the converse action of the hypo and water. The loosened and expanded part may, and often does, contract to its original proportions; but, naturally, does not adhere to its vitreous support. There is perhaps a little time lost before this reverse action sets in, and even so small a difference may lead to serious injury to the negative. Still, all things considered, the remedy is usually efficacious and quick.

Another excellent and even better remedy when the material is at hand is to flood the plate with methylated spirit, placing it, if possible, in a dish to soak in the spirit. The frilling is arrested absolutely and instantaneously, and very quickly the frilled portion, though greatly swelled, will return to its original dimensions. At this stage the plate must be taken out of the spirit, and put in the drying rack. When it is dry there will be perceived a milky deposit between film and glass. This is caused by the presence of hypo, which naturally has not been eliminated by the slight washing the plate had before the frilling set in. So far as visible effect goes, a temporary immersion in water will get rid of the milkiness; but frilling will again quickly supervene, so that the only simple means of action is to immerse the plate in water for a few seconds, take it out, and remove the surplus water by blotting it off, then putting the plate to dry and repeat the process till the hypo is presumed to be eliminated. This plan is too tedious for practical work. What should be done is one of two courses—to tan the film either by alum or formalin. Alum is the favourite remedy, because of its cheapness and simplicity, though some say that it is liable to produce within the film itself the elements of future decay. There is, however, no visible effect, and as the presence of gelatine inhibits, for a time at least, the visible decomposition of many compounds, it may be supposed that in the case under consideration the hypo might be washed out when washing the alum out, and no harm result. The other tanning method is to immerse the plate in a solution of formalin five per cent. This will entirely arrest the expansion of the film, and washing may be carried on with impunity, it being remembered that a film treated with formalin is very impervious, and will need a time twice as long as when that agent has not been used.

It may be noted that either alum solution or formalin may be used in lieu of methylated spirit at the very outset of the frilling. It has been stated that formalin should not be mixed with old fixing solution, as it would reduce the silver present. The best answer to this objection is, put some old and used hypo into a measure-glass, and then add an equal quantity of formalin solution: no action

will be noted, and so it would be in plates: the reducing action in this case is a figment.

There is one other point to be noted. It may be that the frilling has been so rapid that any remedial action would be too late. All then that is left is to let the action proceed till the whole film is loosened. It will be enlarged greatly, and may be put, with care, on another larger plate, or it may be placed in methylated spirit, which will reduce it to its original dimensions; but the drawback to this method is that the film becomes less pliable and elastic, and it is difficult to make it adhere to the glass. Still, when an enlarged negative would be useless, the plan can be but tried. The plans now brought before our readers include all that is necessary to treat the most obstinate and pronounced frilling, and we leave the subject with the intention of some day treating of other disasters and their remedies.

SOFTNESS *V.* FUZZINESS.

A good many young photographers, especially among amateur workers, have, on inspection of various examples of the out-of-focus class of pictures, which, during recent years, have been so much in evidence at several of our photographic exhibitions, wondered by what particular means this peculiar out-of-focus effect, which some wrongly term softness, can be produced, but which, more correctly speaking, is nothing but fuzziness. They are productions of a modern school of workers who have invaded the ranks of photography in a sense similar to a sect of painters who have revolted against the well-recognised canons of art in painting, and have chosen the term "Impressionist" in relation to their productions.

In portraiture there is no doubt that softness, when properly introduced and kept within reasonable limits, affords a subtle charm to photography which is entirely absent in the more keenly microscopic sharpness we see produced by means of unsuitable optical instruments in this branch of photography. The term softness, however, must not be confounded with what has within recent years come to be known as fuzziness or out-of-focus effects, for there is as much difference between the two as there is between night and day, for in portraiture it is well known there is a vast difference between the results obtained under different optical conditions.

This is, at once, evident by the charming images a high-class portrait combination will produce when used by an expert worker, as against those images obtained by lenses less suitable for this particular class of work. In the former case there will be an apparent roundness and plasticity in the image produced by a high-class portrait combination, that is entirely absent in the keen cut microscopic detail produced by means of lenses of the rapid symmetrical type. The result in the one case being charmingly soft, without in any sense being out of focus, whilst in the other the image will appear so keenly cut as to yield an unpleasant feeling to an artistic eye.

Some years ago a great deal of consideration was given on the part of photographers to the production of large direct heads, by which is meant images as large as, and in some instances, slightly larger than the original, and it was at that distant date pointed out that where portrait combinations were employed for this purpose a special knowledge of the optical properties of such lenses was required by an operator, before the best, or, indeed, anything like really good results could be obtained with their aid. Portrait lenses fulfil in a wonderfully accurate manner the purpose for which they were made, viz., the taking of a portrait of a person placed at a moderate distance from the camera, say from twelve to twenty-four feet. When they are employed, or, as it may be more properly termed, strained to accomplish more than this, as we frequently see attempted by photographing life-size heads with their aid, and the image or sitter has to be brought in somewhat close proximity to the camera, then a very important alteration in their use is required. Strange to say, but few photographers seem to appreciate this, for the moment a portrait lens is employed to produce an image larger than the original, it is out of place in its customary form, and the front lens of the combination must then become the back lens, or, in other words, it is necessary to reverse the combination completely. Many years ago, long before the advent of the more modern productions of the fuzzy-school workers of the present day, a valuable prize was awarded to a series of large head studies, produced by a portrait combination, strained in the manner above referred to. The chief characteristic of these pictures was said at the time to be a peculiar softness, the method of producing which puzzled a good many photographers to understand.

In portraiture, as generally understood, there are well recognised methods of producing diffusion or softness, where merely small images are being dealt with. Such means are well known to every portrait photographer who uses portrait combinations for the purpose, and specially designed mechanical arrangements have been provided by opticians for the separation of the back lenses, or elements of a portrait combination to readily yield a pleasing amount of diffusion when such lenses are employed, and this extra degree of diffusion or softness is desired. With other forms of portrait lenses, not fitted with such convenient means of separating the back elements, the same effect may be produced by the insertion of rings of different widths between the back lenses of the combination. By this means a lens which very probably may be yielding a very sharply defined image in the centre of its field, but which towards the edge displays a considerable amount of aberration, is caused to sacrifice some of the sharpness of its centre, and will work more harmoniously (although in a softer manner) over its entire field.

It is not, however, in portraiture alone, in which this softness has within recent years been so caricatured, and prominently brought before the public by a class of workers who have striven to overturn many of the original standards in photography. By the introduction of sickly impressionism, many of their productions have been so extravagantly outré as to merit strong condemnation on the part of those who do not care to see photography held up to ridicule by such caricatures. One of the great charms in landscape work in the early days of photography was likewise "softness," but of a very different order to what we now see perverted into fuzziness. In former years this delightful factor in landscape work was obtained by a careful study of the subject in regard to light and shade, and the care taken in fully exposing and otherwise treating the plate. Perhaps as great a factor as any in such productions was the employment

only of such lenses as are specially suitable for landscape work, for it is well known that the use of rapid symmetricals considerably stopped down yields a map-like impression in landscape work that is by no means agreeable to a cultivated taste. With the employment of single lenses, however, the results are very different, and it is no secret that when in former years this class of lens was always employed for landscape work, pure and simple, by our best workers, the productions were characterised by a charming amount of softness and roundness seldom seen in present-day working by those amateurs whose photographic kit embraces only one lens which has to do duty for all classes of photography. Hence, at former-day exhibitions on criticising prize pictures, such an expression as "How delightfully soft!" was invariably heard in connexion with landscape work. It must not, however, be understood that this softness, as then appreciated, partook in any degree or semblance of what is now termed fuzziness. As then understood softness meant a carefully focussed picture in one or more of its planes, with a delightful introduction of subtle atmosphere as well, and such productions were looked up to and recognised as a necessary feature or standard in high-class work.

Impressionists would change all this and institute instead a method of working which is at once inimical to the great advantage photography confers upon mankind as the most truthful means in many instances of recording scenes and structures which are cherished chiefly, if not entirely, for their truthfulness.

Against this truthfulness we are asked to accept what? In many cases such exaggerated, distorted representations of nature, as are merely born of the imagination of the impressionist, whose chief aim is to depict our dear old granny as she never looked, or clothe the family homestead in such a garb as to make it almost unrecognisable to those who love such dear old scenes by reason of many cherished memories of the past. Pictorial photography, as many would have us now accept it, is vastly different from the more healthy productions of former years. Photography is essentially truthful, or should be so, first of all by reason of its name, "Sun Writing." Within certain limits this truthfulness need not be inimical to art, even although it shows us things as they actually appear, not as impressionists would depict them, or the more healthy artistic mind desire to see and portray them by means of pigment and brush. The impressionist nearly always strives to produce by means of photography what he has not the talent to achieve as a painter. In many instances we see endeavours made to cause photography to yield a sickly, or as some choose to term it, æsthetic sentiment, notwithstanding its unsuitableness for depicting what in reality is truly within the domain of the painter; and this false application of photography has done much to foster a striving after effects that frequently partake of the ludicrous.

Some one stated once, "That a first-rate photographer is a man who unites many talents, and is more useful to the world than three-fourths of all the painters, and nine-tenths of all the sculptors now living. He is not to be counted out or left out of the organization of a community; he is, in fact, much less easily dispensed with than a painter.

Broadly speaking, this is the true platform upon which photographers should stand, viz., truthfulness and utility to mankind. The author of the above quoted sentiment never could have intended to include as photographers those drones who have found in photography a ready field to introduce their incompetences and new sensations, whose vanity is to be an amateur of something, and who, having tried art, and having failed, must perforce fasten upon photography as a means of airing their morbid ideas.

The production of these fuzzy, out-of-focus effects, especially in landscape work, has been much in evidence within recent years, and, like a good many other things, has attracted the attention of young photographers, and those who are never slow to run after what partakes of a revolt against well-authenticated standards of excellence.

Of the different methods by which the fuzziness may be introduced into a photograph, mention may be made of a means which the writer showed and explained to the late Mr. J. Traill Taylor many years ago. At that distant date, the use of coloured screens was just coming into practice in conjunction with isochromatic plates, and it occurred to the writer when studying the best position to place these screens in situ, that probably such would be found in the diaphragm aperture itself. To carry out this idea he got an optician to counter-sink a slight rebate around the apertures for the glass—the intention being to treat such cover-glasses to a coating of coloured collodion, whereby a yellow screen would be provided. This led to further experiments at the time, resulting in the employment of films of varying thicknesses and densities, which were used by inserting the same in the counter-sunk portions of the stops of the lens. On comparing the results obtained by means of these filaments some curious effects were observed, some of which at the time were recognised as detrimental to fine definition. Here, then, lay at least one hidden or unknown method of producing what in more recent years has been looked upon as a positive advantage in landscape work, but which, at the time, was condemned by the late Mr. J. Traill Taylor, as being detrimental to that fine definition so necessary in photography. Since then other writers have been struck with the same effects which these composite diaphragms are capable of producing in the way of fuzziness, some partaking of a strikingly peculiar character, as if one sharp image was superposed above a softer one.

These combination diaphragms can be easily made by counter-sinking the stops of a lens as previously stated, and inserting over the apertures thin films of collodion, having likewise an aperture cut out of them, and according to the different apertures employed, so will there be yielded a greater or less amount of fuzziness in the resulting images. There are other means of producing these questionable effects, now so glaringly displayed in what some term pictorial photography, such as the printing from double negatives accurately superposed the one above the other, a method employed many years ago by practical workers to cause an obliteration of the hard crude lines when copying such subjects as wood-engravings and similar objects on which the lines would appear incongruous when magnified, were no means employed to subdue or soften the same. There may be also mentioned several dodges in printing by which similar effects can be obtained; but the use of combination diaphragms opens up a wide field for those who care to waste time and material in the production of these highly questionable and outré effects in landscape photography.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

THE sixteenth annual meeting of the Photographic Convention of the United Kingdom commenced at Oxford on Monday, in conjunction with the Union Internationale de Photographie. During the day some four hundred members arrived and reported themselves at the Grand Jury Room, Town Hall, where the Hon. Secretaries and members of the Local Executive Committee attended to serve badges of membership. In the afternoon several parties were formed, and, under the direction of local members, visited places of interest in the city.

RECEPTION BY THE MAYOR.

In the evening the Mayor of Oxford (Mr. G. Claridge Druce, Treasurer of the Ashmolean Oxfordshire Natural History Society) gave a reception in the the Town Hall to meet the members of the Convention, and to celebrate the amalgamation of the Ashmolean and Oxfordshire Natural History Societies. The Mayor, who wore Court dress with his civic robes, was accompanied by Mr. and Mrs. H. Balfour, Dr. and Mrs. Veley, and Miss Claridge, officials of the amalgamated societies, and the guests, who included members of the University and Aldermen of the city, wearing full academic and civic dress, were received in the Arcaded Hall. At nine o'clock his Worship proceeded to the platform in the Town Hall, which was now crowded with a large and brilliant assemblage. There were also on the platform Sir William Herschel, Bart., the President; Mr. C. H. Bothamley, F.I.C., F.C.S., Past President; Mr. W. Crooke (Edinburgh), Past President; Mr. G. F. Bainbridge, J.P.; Mr. F. A. Bridge, Hon. Secretary and Treasurer; and Mr. Thomas Bedding, F.R.P.S., Retiring President.

The Mayor said they had a duty to perform as citizens of Oxford, the first duty of course being to give a hearty welcome to those members of the Photographic Convention of the United Kingdom who had come to Oxford, and he thought it was a very happy beginning for the new century that Oxford should be chosen as the place to which the Convention should come. Oxford had many advantages and many beauties which deserved to be more widely known, even among those who lived in its midst; if that was true of those who lived in its midst, how much more must it be true of those who lived far away. They were glad to see there were many persons coming from far-distant places to see Oxford, and they welcomed especially those members from France and other countries on the Continent, who by their presence showed how international was science, and he thought they might claim at this time that photography was a science—almost one of the exact sciences. When one went back to the late years of the thirties when photography was first practically tried in the Daguerreotype by Daguerre, a silver plate being coated by fumes of iodine, with that compound called iodide of silver, it was necessary to expose the plate for as much as thirty minutes in order to get an image, he thought they would be able to point out even to those lay people present, who were not yet bitten with the mania of photography, what enormous advances had been made during those years in lessening the time necessary for the exposure of the photographic plate or medium. Photographs were now obtained quite readily with a thousandth of a second exposure, and he supposed that was quite looked upon as slow now. The very rapid exposures that were given were not after all like toys, they had taught them great scientific truths. In the case of a bullet flying from a gun with an enormous initial velocity, the air waves before the bullet had been shown on a plate in a way the human eye could never see them unassisted. Such things as these were only some of the many manifold ways in which photography had been a help to its sister sciences, and it was even now only in its beginning. When one remembered the applications to stellar work, how happy was the Convention when it had for its President the distinguished son of a distinguished sire, bearing the name of the Astronomer who discovered the great planet Neptune, and whose descendants had shown that keen interest in photographic work which they all there thought most highly commendable. That night Sir William Herschel had come to show them in his Presidential address what the possibilities of photography in the future would be, and he was quite sure the members would go away impressed b what they had heard. Before he sat down, let him again offer t every member present who came from other towns, a very heart welcome to Oxford. He hoped they would carry away with the many mementoes of Oxford, lovely photographs of the histori buildings and other treasures of which Oxford University and Cit is the centre. He hoped they would have pleasant weather to enjo it, and if they did they would go away impressed with the beauty o Oxford, and they would say at any rate some time or anothe between the year 1901 and 2000, they would come again t Oxford at a Convention.

Mr. Thomas Bedding, the retiring President, said that one of th greatest pleasures that anybody occupying the position that he had ha the honour of filling during the last year was that of introducing hi successor, and that night the pleasure was allied with an exceedingly simple task. It needed very few words of his to commend Si William Herschel to that gathering. The Mayor in the eloquent address by which he had opened their meeting had given some ex cellent and cogent reasons why anybody bearing the distinguished name of Herschel was a fit and proper person to occupy that position in their Convention. But to him there was another and perhaps equally important reason why they should welcome Sir William Herschel to the Presidental Chair of the Photographic Convention. They were aware that that meeting partook very largely of an international character, and who could more fittingly occupy the position in an International Photographic Convention, than the bearer of a name which was of international renown in science. He was not going to discourse to them upon the theory of heredity, but he thought they were distinctly to be congratulated upon the fact that they were to be presided over by a gentleman who was a descendant of that Sir John Herschel, to whom they as photographers owed a very great deal. Sir William took, and had taken very great interest in the topic of the hour in photography, that was photography in natural colours; and that night, to let them into a little secret, he was about to give them a most beautiful and luminous discourse with a number of strikingly beautiful illustrations of what colour photography had reached at the present stage. He was quite sure that from that moment a new page in the history of the subject would be turned over. It was their privilege as a Convention that that page would be turned over by Sir William Herschel, and that they had the great pleasure and privilege of listening to him that night. Without further remark he would ask Sir William to take the chair, and formally introduce him to them as the President of the Convention.

Sir William Herschel, amidst general applause, then took the chair, and expressed his thanks to the Mayor and Corporation for their great kindness in receiving the Convention as they had done that evening, and placing that beautiful room at their disposal. Hospitality claimed precedence of all other privileges, and therefore if he put the Mayor's name before that of Mr. Bedding he would be only carrying out an old-world established custom. Addressing Mr. Bedding, Sir William begged to offer to him and the members of the Convention his most sincere, and he could truly say his most humble thanks to them for the great honour they had done him in choosing him as their President. No one shared the pride in the name more than he did himself. For any other merits of which he had heard a good deal more that night than he had ever heard before, he must ask them kindly to let the remembrance of those words lie altogether in abeyance, and to trust not to the words of praise that had been said to them, but to the really actual subject-matter he would introduce to them that night. If that was not enough to give them pleasure he did not know what pleasure meant in science. One word more he must add. Mr. Bedding and the Mayor had referred in very proper terms indeed, to the great satisfaction it must be to them to welcome among them those who had come across the sea to visit that ancient City on an occasion of that kind. He should refer later to the great debt of gratitude that they owed to France and to Germany for their work in photography, and if he postponed his words of thanks till the moment came, he hoped they would not think he had forgotten the duty.

The Mayor then presented the Retiring President with a Vice-President's badge, and said there was one other duty which they would

ow him to perform. That day witnessed the first meeting of the ıalgamation of two great societies—one of them an old and ustrious society that took its name from Elias Ashmole, a great nor to this University, and to whom they owed the Ashmolean useum, which, as they knew, in great part was made up of adescant's Museum in London. All the wonderful array of things ought from all the known parts of the world at the time were thered in Tradescant's Museum in London, and Elias Ashmole, with at power of acquisitiveness which he possessed in a very high gree, managed to get hold of it. In memory of Ashmole a ientific Society was established of those who were prominent orkers in Oxford. It numbered amongst its members His Majesty. ıe other Society to which he alluded was one of quite recent nes, but was numerous and strong—the Oxfordshire Natural istory Society—and it had been felt by those interested in both cieties that better scientific work could be done in the future if ese two bodies with common interests should join together, one inging the rich store of a great library, and the other a large num- r of members. It was hoped that the amalgamation would work every way for the furtherance of that science which they all had heart in Oxford. He thought that gathering was a very happy ıgury for the future of those amalgamated societies.

COLOUR PHOTOGRAPHY.

RESIDENTIAL ADDRESS BY SIR WILLIAM J. HERSCHEL, BART., to the Sixteenth Annual Meeting of the Photographic Convention of the United Kingdom, Oxford, July 8, 1901.

The attempt to reproduce the natural colours of objects in a picture them by means of photography may be regarded according to a an's fancy either as a confession of weakness, of lack of artistic ower in oneself, or as a laudable ambition to invoke the powers of ature to do what, with all human skill, no artist can ever expect to o, or ever claims to do. The artist, whether of the pencil or of the alette, has a liberty of expression which must for ever make him aster of the spirits of men when they seek the aid of painting or awing to represent any scene to their senses. He alone understands ıe spirit that seeks his aid. He alone knows how to minister to it the way that will most delight and instruct it. God has given him great wealth of materials, and the incomparable gift of genius in is use of them to interpret a scene to his fellow man; if he fails, as e often does, in his task, that is no more than human frailty involves. When he succeeds, he has given us a joy which we never dream of taining in any other way short of once more beholding the object our desires as we saw it in some happy moment of our lives. I n speaking, of course, only of realities, and not of poetical or leal art.

No one can be more conscious of the vast interval that lies between imself and the true artist than the humble follower of nature along ıe paths of colour photography. To describe his position as a udent fully and justly would occupy more time than you can spare ıe; but of this I am confident, that no artist can have his feelings ıore keenly cultivated, his appreciation of the delicacies of hue and f shading more exalted, or his ambition to equal nature more excited y the first fruits of his labours, than the patient, watchful handler f the camera and its adjuncts. The artist, indeed, stands at a range disadvantage here. No joy can ever reach him which he has ot, in the richness of his imagination, already tasted before he meets face to face on his canvas. But who that has hung in eager xpectation over the growing wonders of the sensitive plate would xchange his happiness when success rewards him for that of the rtist over his own handiwork—surprise, gratitude, exhilaration—ıese are the sudden moods of the photographer who throws himself ıto the arms of Nature, and trusts to her methods, while incessantly leading for more and more of her instruction. What shall I say of is many, many disappointments? Let them pass. We know their alue, and the artist knows this too. Our joys and his are not the ame, but both are ripples of that *ἀνηριθμον γελασμα*, the countless aughter of the ocean on which God's great gift of light dances and ntrances us.

So it is in the most perfect humility of spirit that we approach the subject of our discourse this evening—the practical methods now known to us of producing coloured photographs.

These fall into two groups. In the first, as now in our common possession and practice, come those which employ coloured glasses or films to feed the photographic plate, leaving the latter to take what it will, or refuse what it will, according to the high commands impressed upon it by the sun. Let no one be under the delusion that here is any room for the colour artist, man, to tamper with the result, to distribute the colours according to his fancy. The very contrary is the case. No department of photography is so hopelessly bound to perfect honesty, and freedom from trickery as colour-photography. A first-year apprentice in the studio of Mr. Herkomer would as soon think of improving the master's touches! It would mean ruin to the picture. Whatever colour is supplied is fairly offered to the sun at every pin's head of the plate alike—but whether it is to be seen at all—and if seen whether it is to be seen in its full strength or weakened to any necessary extent, is not in our hands. That rests with the light itself to determine which falls there on the sensitive surface, and woe to the man who tries to interfere there. He may use some influence in regard to considerable areas at a time, just as the ordinary photographer can shade or modify the light to produce general effects, but as to details he dare not say a word. He might as well try to improve a miniature with a house-painter's brush.

The first specimens of this kind which I introduce are those of Mr. Ives's process.

The three photographic positives here thrown on the screen together as one picture are plain black and white. They each act in the same way that the natural object did—they do not, indeed, absorb the colour of the covering-glass, but they do what comes to the same thing; they block it out either totally or in various degrees as each point of the object did by absorption. The positive was obtained by photographing the object through a glass of somewhat similar colour. That it is not the very same colour is due to the fact that the photographic power of coloured light is not on all fours with its colouring power upon the retina.

To go into anything like detail on this complex and still debated part of the science of colour-photography would be quite impossible—and I am glad for your sakes that it is so, for only a strong expert like Mr. Ives or Mr. Sanger Shepherd could lead you aright there. Suffice it to say that at this point the judgment of the human eye is the final court of appeal, and no conclusions based upon anything less than large practical experience, can be deemed final. We are still in the purely empirical stage of knowledge as to the physical connexion between the colour and the actinic power of any given light. We are not even sure that a given colour of a given intensity has a constant actinic power on a given film. What we see here is the result of Mr. Ives's immense practical study.

His Kromskop introduces the three colours to the eye, not by superposition, which as you will readily see would put three extinguishers on the top of each other, but still by true *com*-position. The mirrors (sheets of transparent glass) which do this are models of inventive power. They are not clear glass but tinted, and the reason for this is a matter of refined delicacy. The already green image passes through a transparent green glass, placed on a slope which thus serves on its front face as a mirror for the blue image. The latter would be reflected from the back surface also if the glass were clear white; but being green it absorbs the second reflection sufficiently (in the double passage of the blue light) to make it innocuous. The composite blue green image passes on to the eye through another sloping transparent mirror placed to reflect the red image in the same line of sight. The same danger of a double red image is avoided here by tinting the mirror blue-green, which lets the blue-green image pass, but kills the red light which endeavours to get twice through it. The perfection of the register is thus preserved.

Of a cognate character, but very different in its method, is Mr. Sanger Shepherd's process, in which three differently coloured films are *super*posed one on the other in a single transparency. They are all positives without any opaque silver deposit to block out light. The only gradation is from clear white to the deepest colour of the dye on each film—superposed they act as absorbents, and so effect the same

purpose as Ives's black and white photographs, but with the enormous advantage that where they do not absorb each other they let clear white light through—whereas Ives's plates can only show white by combination of three more or less enfeebled primary colours.

To explain the choice of the three dyes shown at sufficient length would occupy too much time. Suffice it to say that each lets through a carefully adjusted *couple* of the primaries which Ives uses singly. The original negatives (three in number) are taken through the single primaries, and each is printed on the film which is dyed by both the others. It is really a very simple device, and one of the happiest conceptions in the history of colour photography; but as I always get a sick headache when I try to explain it, I beg you will not put me to the test. I believe Mr. Sanger Shepherd is here, and he is hard and clear as glass about it.

The next system is that known to us as Dr. Joly's, and now as the Joly-Macdonough process. Sheer pressure of time makes it impossible to trace the development of this from the first suggestions of Du Hauron to the present day. You will only look to me here to describe the results obtained.

We deal here solely with the three primary colours, as before in Ives's. The colours are laid on the screen, or in the slide, on a plate of glass, in very thin lines, in triplets of colour, one red, one green, one blue, covering the whole plate impartially, Where nothing interferes, as in the background here, you have white. There is here neither composition, nor superposition of the colours, but mere juxtaposition. The eye settles the matter between the adjoining colours as best it may, and although the general effect is very much the same as by *com*-position or *super*-position, there are characters about *ap*-position colours which differ considerably from the other two. It is hard indeed to get just comparisons between the three methods, and I am not aware that any really scientific experiments for that purpose have been made, but as one star differeth from another in glory, so it is here. The original negative—a single one, which is a great consideration in common use of it—is taken through a single plate of glass (the taking screen), ruled with colours almost identical with these; and each colour line of the viewing screen is then blocked out or graduated precisely as for Mr. Ives's sheet colours, by the black deposit which the positive puts over each separate line. The Macdonough method latterly introduced to us by Mr. Tripp, the spirited owner of the late Mr. Macdonough's rights, uses much finer lines, a carefully adapted sensitive plate, and a carefully adjusted orange-yellow light filter. The results are before you, and I think you will agree that they raise the very highest hopes of a practical success for colour photography being within our reach, if only we are not too greedy and exigeant. By this method a single exposure gives you the single positive which, backed by a viewing screen assumes the natural colours with an accuracy which we can only describe as amply sufficient to satisfy a ravenous appetite. To spoil our enjoyment of these and the other lovely products of the camera which we have seen by dwelling unduly on the shortcomings is to my mind a sheer act of vandalism. By all means let criticism come in to help us on to perfection, but meanwhile let us feast on the good things provided for us and render our heartfelt thanks, first to the silent toilers whose anxious and too often crushing labours have gained for us such a charming addition to our pleasures in life, and then, as always we must honestly do, to the bountiful Giver of that which alone makes life worth living—a joyous and a grateful spirit for every advance in knowledge and in skill.

The processes so far touched on are all the results of constant seeking after easy roads along practicable inclines. The next one known by the name of the inventor, Dr. Lippmann, is in every aspect different. Brilliant as the results are which I am able to show you, it is the most difficult of all to practise; as if light could not surrender its secrets without a desperate struggle. Mr. Edgar Senior stands, as far as I have been able to learn, almost alone in England as a successful worker. Dr. Neuhauss in Berlin is one of the very, very few on the Continent whose devotion to this splendid endowment of science has been rewarded by adding a crowning triumph to that of Dr. Lippmann, which I will endeavour to explain presently. But first I must go back a few years and refer to the startling application made by Otto Wiener of the powers of photography to analyse the nature of its own life. The doctrine of the "stationary light-wave" had been disclosed, and turned to account, as early as 1868 by Wilhelm Zenker in the explanation he offered of Becquerel's spectrum, in its natural colours, on a chlorinated silver plate. I am fortunate enough to have here a specimen of Becquerel's handiwork given by him to my father in 1849; which is still, as far as I can judge, in nearly the same state as I have seen it to be any time in these last twenty years. I shall be happy to show it to any one afterwards in moderate light. The colours of the spectrum are dim indeed, but quite unmistakable.

Zenker could not prove his explanation by experiment. It was Otto Wiener, in 1890, who conceived the idea of doing this, and it is difficult to imagine a more beautiful or exciting experiment than that which he carried out.

He assumed Zenker's view to be true, that when light (say monochromatic, for in fact he used the bluest part of the arc light) falls perpendicularly on a mirror, and is reflected on its own tracks, it instantly meets the incoming wave in such a manner as to form a new kind of wave, of the same wave-length and period of oscillation as before, but of greater vehemence of swing, and having this further peculiarity that the whole line of the ray becomes like a stretched fiddle string, vibrating strongly, but never shifting the position of the dead points, as an ordinary advancing wave of light does. The consequence is that the vehemence of the vibration is steadily applied to the ether there where the crests and hollows of the vibrations occur, while the intermediate nodes (fixed positions, observe), are undisturbed, though under enormous tension of periodic intensity and nullity. Zenker asserted that actinic alteration of the sensitive salts must take place at these points of agitation, and not elsewhere. Wiener desired to prove this, and he did it thus: The points of agitation will in their millions form planes of silver dust (after development) parallel to the mirror, and alternating with planes of soluble salt which will be removed in the fixing bath. He covered a glass plate with an exceedingly dilute and sensitised collodion film, which when dry he made to be only $\frac{1}{30}$th part of the wave-length of sodium light (D) in thickness. Consider for a moment the delicacy of such an instrument of research. The ordinary film we use may be the $\frac{1}{10}$ of a millimetre thick; it will carry in its body say 300 actinic planes of D light, but between any two of these might lie 10 or 15 of Wiener's sensitised films. Now imagine a glass plate, carrying one such film only, laid flat on the mirror, film downwards, and then tilted up very little at one side, so as to cut through the actinic planes at a long slope. Then let monochromatic light fall plumb on the mirror through the perfectly transparent film. This Wiener did, with the result which I now show you. Here is a beautiful reproduction of his own photographs (Mr. Robinson's work). In some of them you see the parallel bands of black where the plane of the film cut the successive actinic planes with stripes of clear white between representing the planes of the nodes. It was easy to show that these distances fitted with what the wave-length required they should be; and thus Zenker's explanation of Becquerel's good fortune was proved true.

I have not said where the first actinic plane lay in respect to the mirror. Wiener proved this also. This photograph shows it—he pressed his flat film hard against the convex face of a very flat lens, instead of resting one edge on a plane mirror. The lens reflected light enough for his purposes, and here you see the rings in which the film cut the spherical actinic planes. They obey, you see, the necessary law of diminishing intervals, and you now see that at the centre where the film and the mirror practically form one sensitive plane, there was no deposit, a statement confirmed by the law of the diameters of the rings.

If I may interpret this according to my imperfect knowledge of optics, where modern English text-books seem so to disagree, I would say that by this exquisite experiment photography had established a fact of crucial importance in the theory of light, viz., that the first actinic plane formed by reflection is at a quarter of a wave-length from the mirror. It follows as a consequence almost irresistible to common sense, as Wiener says, that there also is the first rocking of the stationary wave. I dare not, indeed, offer this to you as an accepted certainty—the Vatican has not yet pronounced on it in

fallibly, as far as I am aware; but, assuming it to be true, see what it means—nothing less than this, that we have, by the infinite delicacy of photography, obtained a definite ocular demonstration of the precise seat of power which ether waves have over chemical compounds. If I hesitate in committing my own belief to this explanation (and my belief is a matter of absolutely no importance to any one else) it is because it is not inconceivable that the disruptive action which does take place may after all occur close round the spot where the stationary ether of the node, and therefore the matter which is affected, is under alternate tension and relaxation. However that may be in physics, the difference is not of immediate importance to us in photography that I see. The actinic planes were proved by Wiener to exist. Lippmann turned them to vital account for us, and gave us, in the way we all know, true colour photography. He used thick films for the express purpose of securing what Wiener desired to avoid, reduplication of the actinic planes, and with them the strong creation of colour. Here are some of the most exquisite results of his process. I owe them to Dr. Neuhauss, who kindly supplied me with a spectrum and a vivid picture from what I may call still life—and to Mr. Senior, who has placed his best specimens of a spectrum with the Frauenhofer lines at my disposal for your service. A more precious one than any of these is this given me by Dr. Lippmann himself, a tribute to my father's memory as a pioneer of photography, which I shall be happy to show afterwards. It is the simple naked film itself.

Before parting with Lippmann's process I feel sure that you will like to see the decisive evidence obtained by Dr. Neuhauss of the presence in the film of the supposed strata of silver spangles, as I may call what looks like a brown stain more than anything else, by transmitted light. He has actually made a microscopic section of the colour cradle, and by means of the most refined conditions has been able to take once more by aid of photography a visible picture of the subtle work of light in the interior of a Lippmann film. Here is a copy of it on the screen which he has sent me himself—with his explanation of its import and its manufacture. All room for doubt (if science could cease from doubting its own creeds) would seem removed by this simple fibrous-looking strip of lines. It is a rare pleasure to be able to exhibit such brilliant colours, and such surprising demonstrations of their cause, here in Oxford, and to acknowledge at the same time that the whole series of investigation and invention which have furnished these magnificent results is the fruit of French and German industry and genius.

At the conclusion of the address some excellent slides were shown by Mr. Bridge, the Hon. Sec., and attention was divided between these and the refreshments, which were served in the Mayor's parlour, Committee room, and other convenient places. The handsome and massive Corporation plate was on view, and an object of especial interest was Cronje's riding whip, which was presented to the Mayor by one of the Colonials on visiting Oxford after returning from the war. The Hungarian Band was engaged, and played during the reception.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION FROM A NEW ZEALAND STANDPOINT.

Members of the newly formed Professional Photographers' Association will no doubt be interested to learn how that movement is viewed in far-off New Zealand. Writing in "Sharland's New Zealand Photographer" for May, the Editor, Mr. Josiah Martin, shows that he has a thorough appreciation of the necessity for calling the P.P.A. into existence:—

"The weakness of individualism was never more keenly felt than in this age, when labour is everywhere organizing the helpless units of society into a corporate union, which is powerful enough to make its voice heard in the councils of the nation. On the other hand, the peaceful enjoyment of personal liberty is seriously threatened by the growing tyranny of might—which, even in the midst of the most democratic countries in the world—rears its menacing head in the form of the millionaire, the syndicate, the trust, and the combine, with an arrogance greater than that of any oriental despotism, which seeks, for its own selfish ends, to dominate the councils of the State. Masters and employers of labour are learning also that 'union is strength,' and they are striving by various associations for mutual protection to preserve their business interests from the disastrous effects of ruinous competition. While each party is thus striving to advance its own special interests, the necessity for a practical and economic Federation becomes more and more urgent; for in its calm councils every diverse interest should be carefully considered and personal aggrandisement restricted for the benefit of the whole community.

"Photographers in business have several times made spasmodic efforts to bring about an organized association or union, in order to protect themselves against unfair competition, to regulate prices, and to safeguard their mutual interests, but in nearly every case their efforts have hitherto proved abortive, no cohesion being possible when the several parts are mutually repellent. Now, however, a common danger threatens 'the Trade'—an enemy has declared war, and consternation and alarm has awakened the hosts to a sense of their defenceless position. Certain wealthy firms, firmly believing that advertising is the life of trade, have issued a proclamation throughout the world, calling upon all consumers of their own special wares to send to them their portraits for reproduction. For half-a-crown a dozen they promise to give mounted cabinet bromide reprints from any photograph that may be sent to them. They ask only for a portrait, and an undertaking that by reproducing it they will not infringe any copyright. This advertisement has been very conspicuously displayed, and must have cost the promoters a considerable amount, which as business men they reasonably expect to recoup, either from the increased sale of their goods, or from the profits they may make on the orders for photographs.

"The photographers of the old country are virtuously indignant at such an infringement of their prerogative, and recent trade journals are full of notes and correspondence on the subject. Some suggest one thing, and some another; but all agree upon the necessity for promoting a better understanding among the men who make a business or profession of photography, and possibly a new union or association will be established. But what can they do? when the law gives to every sitter the copyright of his portrait, and any one is free to have it reproduced just as one may please, without any reference to the original photographer. For several years past the reproduction of prints in large quantities has passed out of the hands of the photographer; now the reproduction of small quantities is threatened in a similar manner, possibly because the work can be done on a large scale by mechanical contrivances, cheaper than by a single hand. The great advertising traders who are thus attacking the poor man's business have left him just the possibility of making a negative and one print; and until the tobacco merchant or the soap-maker offers to give coupons with their wares entitling the holder to a free sitting for his portrait, the local photographer can recoup himself for the loss of profit on the prints, by arranging for a higher price for taking the portrait. Already there is evidence of a reversion to the original custom of making one copy only for each sitter, and some American professionals are doing good business in this line.

"It may be easy to call indignation meetings, to pass resolutions, form committees and make rules, but no amount of discussion will put back the dial which marks the advance of time and the coming of a new order of things. No professional, whose work has been well tested, need fear the competition of cheap reprints; for it is well known that prints from a copy can never equal in quality those from the original negative, but it is in the small studios that the loss of the most lucrative business will be most keenly felt. The problem of the day is, how to protect small and independent trades against the crushing power of wealth, and how to preserve individual freedom in the face of such a concentrated energy. Other trades are feeling the unequal contest very acutely. Much may be done by the union of kindred interests for mutual defence, but under the principle of federation may we not hope to see the interest of the individual conserved, and some restraint placed upon the ever-growing, but merciless power of accumulated wealth?"

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

By the courtesy of the Honorary Secretary we append a list of the paid members of the Association who have joined since the last meeting:

Ashley, Arthur Ernest, 31, Grove-street, Retford.
Blackburn, Fredk. Tom, The Studio, Station-road, Budleigh Salterton, S.O., Devon.
Capstick, Thomas Edward, Studios, Broadwood and Main-street, Ingleton, Yorkshire.
Coath, John H., F.R.P.S., Photographer, The Fore-street Studio, Liskeard, and the High-cross and Victoria Studio, St. Austell.
Ellis, Arthur W., Photographic Artist, The Sid Vale Studio, High-street, Sidmouth, and at Russell-street.
French, A. E. (A. E. French and Son), The Royal Studio, 24 and 26, South-street, Wellington, Somerset.
Jones, T. Wills, The Magnet Studio, Rhyl.
Lankester, Percy, Photographer, Tunbridge Wells.
Langfier, Louis Saul (Langfier, Ltd.), 158, Sauchiehall-street, Glasgow.
Nesbitt, Herbert Victor (Hutton and Nesbitt, Photographers), Langley Moor and Brandon, co. Durham.
Protheroe, Lewis R., Photographic Artist, 3, Narrow Wine-street, Bristol.
Parker, Robert, Photographer, 288, High Holborn, W.C.
Symonds, William, The Pier Studio, Llandudno.
Simmons, George V., 138, Anerley-road, Anerley, S.E.
Wicks, George Henry (G. H. Wicks and Son), Bristol South Studio, 110, East-street, Bedminster.
Warner, C. B., 10, Broad-street, Hereford.

ON THE CHOICE OF TONING BATHS FOR GELATINO-CHLORIDE PRINTS.

II.

No. 6. The Molybdate Bath.—The salt chosen for the next series of experiments was potassium molybdate. A toning bath of the following formula was prepared:—

Potassium molybdate	20 grains.
Chloride of gold	0.66 grain.
Water	10 fluid ounces.

The prints were washed for ten minutes and rinsed for one minute before immersion in the above bath. The action was fairly rapid, the image passing through several shades of brown in the course of seven or eight minutes. Nine minutes' treatment produced a deep and somewhat cold variety of brown, and six or seven minutes' immersion an agreeable sepia. A shorter period of treatment gave a good reddish-brown or brownish-red. In one or two cases there was a slight tendency to discoloration of the shadows, particularly in those portions of the image lying nearest to the margins of the print. This defect was, however, noticeable only in the case of prints in which, owing to the nature of the subject, the depth of tone in the extreme shadows was somewhat excessive. The colour so produced was a light and dullish red.

Fixing was carried out in the usual manner. Upon the immersion of the prints in the hyposulphite bath, the appearance of the image underwent a speedy change. In the shadows the colour became both lighter and colder. In the more delicate half-tones the alteration was still more apparent, the original warm brown hue of these being exchanged for a yellowish-green. The further action of the hypo-sulphite solution did not produce any improvement in the quality of the tone. The washed and dried prints, it must be added, did not lack brilliancy or vigour, but were objectionable merely on the score of their colour.

No. 7. The Malate Bath.—The salt the toning properties of which were next investigated was sodium malate. The bath employed was made up according to the formula:—

Sodium malate	32 grains.
Chloride of gold	0.5 grain.
Water	8 fluid ounces.

The untoned prints were washed for ten minutes and rinsed for one minute before being immersed in the bath. The toning action was found to proceed with greater rapidity than in the case of any other bath tried in the course of the experiments. A treatment of only two minutes' duration sufficed with the malate solution to give a good brown colour, the shade of which approximated to sepia. It was, however, as a rule found advantageous to increase the period of immersion to five or six minutes, trial showing the slight additional trouble thereby incurred to be amply compensated for by the attainment in the resulting prints of a vigour and richness of tone scarcely to be surpassed. On the other hand, a longer immersion seemed to act injuriously to the quality of the gradation of tone. Several prints were retained in the bath for further treatment—varying in duration from seven to twelve minutes, according to the nature of the subject. In no case was the result obtained in any way superior to what it was in the prints that had been removed from the bath at an earlier stage. Not only was this so, but also the prints so treated exhibited for the most part certain defects. Over-toning was particularly noticeable, and manifested itself by imparting an effect of flatness and want of transparency, whilst, in addition to this, the brown colour of the image exhibited a decided deterioration.

Amongst the merits of this bath must be mentioned the ease and safety with which in practice the operations can be carried out. At no stage in the treatment of the prints was there any appearance of double-toning—using that term in its commonly accepted sense—nor yet of stains, and this even when the action of the bath had been prolonged beyond the period actually necessary.

On the transference of the toned prints to the hyposulphite bath, a slight alteration in their colour was observed. This was most apparent in those cases in which the image had received only a very superficial coating of gold. The colour now produced was of a colder shade of brown in the darker portions of the image, passing through a nicely graded succession of lighter tints to a delicate olive in the softest half-tones. Taken all round, an increase in the depth of the shadows and darker half-tones was noticeable after fixing.

The prints when washed and dried were little inferior in quality and appearance to those which had been toned in the benzoate-sulphocyanide bath. The latter, however, were rather warmer in tone. As a general rule, a finer quality of tone was obtained with the malate bath in the case of prints in which the range of contrast was not of a pronounced description. Those from thin and chalky negatives were less satisfactory in this respect, owing to the somewhat sombre effect of the unbroken depth of colour that was produced.

No. 8. The Malate-Sulphocyanide Bath.—Sixteen grains of ammonium sulphocyanide having been added to and dissolved in the malate bath, No. 7, lately employed, the untoned prints, after washing as usual, were successively immersed in the solution. The usual orange tone, due to the solvent action of the sulphocyanide, speedily ensued, the bleaching of the image being effected in the space of two minutes thereby. After this, toning properly so-called proceeded steadily but somewhat slowly.

Ten minutes' immersion in the solution was found necessary to produce a sufficient deposit of gold. The colour of the prints so treated was a remarkably warm purple, inclining to purple-red in the half-tones. Owing to the highly transparent character of the purple film formed, the gradation of tone produced was unusually fine. The remarkable purity of the whites also contributed in some degree to the resulting breadth of effect. In one respect, however, the bath failed to conform to the requirements which were formulated in the preceding article. Even with the exercise of the greatest care, it was found almost impossible to avoid staining the prints during the toning operations. These stains, though in most cases of insignificant proportions, were peculiarly noticeable by reason of their colour, which was a bright vermilion. Owing to the shortcomings of the bath in this respect several of the prints of the batch were quite spoiled, and the appearance of the majority were more or less marred.

On fixing the prints little or no change of tone was discernible, nor was any difference in their appearance to be detected when they were removed from the hyposulphite bath. The stains, it should be added, were equally permanent, though after fixing their red colour was a trifle less obtrusive. The one objectionable feature characterising this bath might perhaps be got rid of by varying the relative proportions of gold, malate, and sulphocyanide. This, however, is a matter which only experiment can determine.

No. 9. The Phospho-Benzoate-Sulphocyanide Bath.—Experiments were next made with a combination bath containing three salts in addition to the chloride of gold present. The following was the formula that was employed:—

Sodium benzoate	60 grains.
Disodic orthophosphate	75 grains.
Ammonium sulphocyanide	38 grains.
Chloride of gold	1 grain.
Water	15 fluid ounces.

It will be seen, on comparing their respective formulæ, that this bath is a modification of the combination, No. 5, already described.

The prints, having been washed for ten minutes, and afterwards well rinsed, were transferred to the toning solution. They speedily assumed the usual orange colour, an interval of from sixty to seventy-five seconds sufficing to effect the change of appearance. The actual toning process was, however, an extremely slow one. The influence of the benzoate was very evident in the first stages of the manipulations, the tone produced bearing great resemblance to that obtained with the benzoate-sulphocyanide combination, namely, a warm brown or brownish-red. After nine or ten minutes had elapsed the action of the phosphate began in its turn to manifest itself. The growth of a violet-grey tone inclining to a pale blue in its lightest shades was gradually apparent, and in the course of a few minutes the alteration thus effected in the hue of the image became very prominent. A noteworthy feature about the colour phenomena in question was that each of the constituents active in producing the change proceeded to effect its own special work independently of the other. There was, so to speak, no overlapping or superposition of tone values

such as to impart the impression of an image in monochrome. Instead, the effect produced was really a dichroic one, and that of a character rather uncommon. The benzoate—assuming that salt to be the constituent active in producing the warmer tones—appeared to have confined its action upon the image to altering the colours of the shadows and darker half-tones, the remaining portions of the picture exhibiting no change attributable to this source. The influence of the phosphate, on the other hand, revealed itself in operation by completing the work thus left undone. By its means the lighter half-tones and high lights were, in their turn, duly rendered, but in the colder hues characteristic of this salt.

In order to produce the finest effects with this bath it was found that an immersion of from fifteen to twenty minutes was required. The progress of toning during the latter stages of the treatment was exceedingly slow.

Beyond the fact that in one or two cases during the toning operations minute reddish spots made their appearance in those portions of the print representing the greatest depth of colour, no trouble was experienced in regard to stains. As to the spots in question, these were hardly discernible in the finished prints, owing to the circumstance that their colour after fixing did not greatly differ from that of the surrounding shadows.

No visible alteration in the quality of the tone of the prints was effected by the hyposulphite solution.

Altogether the results of the experiments with this formula were the most satisfactory of any. The variety of tone exhibited by the prints in the finished state contributed materially to the beauty of their appearance by helping to emphasise the more subtle contrasts of light and shade. Contrary to what might have been expected, the gradation of effect produced was well-nigh perfect, notwithstanding the wide difference in colour between the shadows and the high lights. There was nothing patchy in the appearance of the image, the warmer tones blending in a natural manner with those of a colder description. In particular, the idea of atmosphere was admirably suggested by the delicate violet and blue-grey tones of those portions of the picture representing objects lying in and near the plane of the horizon.

The novel effects obtainable with this combination bath are such as well merit the attention of professional printers, and the comparative ease with which the operations can be carried out should, apart from other reasons, serve to recommend the formula to those who are dissatisfied with the baths in everyday use.

No. 10. The Benzoate-Phosphate Bath.—A combination bath of the following formula was prepared:—

Sodium benzoate	13 grains.
Disodic orthophosphate	25 grains.
Chloride of gold	0.66 grain.
Water	5 fluid ounces.

The prints, having been washed as before and well rinsed for two minutes, were transferred to the toning bath. The presence of a larger percentage than usual of the chloride of gold naturally tended to accelerate the progress of the operations. A fine purple tone of a crimson shade was obtained in the space of about five minutes. In seven minutes more a deeper but still warm shade of purple was produced, the action of the bath having become now somewhat less energetic. An immersion of fifteen minutes in duration was required to produce a cold purple tone, which, in its turn, when five minutes more had elapsed, gave place to a greyish-black. During the treatment of the prints in the bath there was no appearance whatever of stains or of double-toning, nor was anything of the kind apparent during the subsequent operations.

The proofs were duly washed and fixed in a hyposulphite solution of the usual strength. In the first stages of the fixing process a certain loss in the intensity of the image was noticeable, but afterwards the prints regained much of their former appearance. The quality of tone was only very slightly—in some cases not at all—affected by the action of the bath. The proofs in their finished state were amongst the finest produced in the course of these experiments. The wide range of tone exhibited, and its uniformly agreeable quality, together with the remarkable absence of local defects, were the chief features worthy of note. In the matter of vigour and force of contrast, the best prints of the batch were those which had received from ten to twelve minutes' treatment in the toning bath, a longer period of immersion tending to produce a slight but noticeable flatness of effect.

No. 11. The Benzoate-Tungstate Bath.—The bath next tried was a modified form of No. 4, with the addition of a few grains of an alkaline tungstate. The stock solution was made up according to the formula here given:—

Sodium benzoate	32 grains.
Sodium tungstate	32 grains.
Chloride of gold	0.5 grain.
Water	8 fluid ounces.

After having received the customary preliminary treatment, the prints were transferred to the baths containing the above solution. The action was fairly rapid; so much so indeed, that in from four to five minutes a considerable change was effected in the appearance of the image. The tone produced was a reddish shade of brown. A somewhat longer immersion, viz., eight minutes, gave a rich purple-brown colour. At this stage it was thought well to suspend the toning operations, and the prints were accordingly removed from the bath. After washing, each print was in turn carefully scrutinised before transference to the fixing bath. As a result of this examination, reddish patches, differing slightly in tone from the surrounding gold deposit were detected in a number of cases.

When first immersed in the fixing bath the prints lost considerably in depth of colour. An alteration was also apparent in the tone of the prints last removed from the toning bath, which in place of their late purplish-brown hue now assumed a warmer shade of the same colour. During the fixing, however, the image gradually regained much of its former vigour. The reddish patches above-mentioned did not entirely disappear during the operations, but the alteration effected by the hyposulphite bath in the quality of the general tone served to render them inconspicuous.

No. 12. The Tungstate-Phosphate Bath.—In the next bath tried the benzoate of the preceding formula was replaced by a phosphate. The actual quantities of the respective constituents employed were:—

Sodium tungstate	16 grains.
Disodic orthophosphate	48 grains.
Chloride of gold	0.5 grain.
Water	8 fluid ounces.

Prior to toning the prints were washed and rinsed as usual. The bath was found very rapid in its action. The tone produced varied considerably in range according to the length of the immersion. Three minutes' treatment gave a fine warm brown image, six to eight minutes a reddish black, and ten to twelve minutes a slate grey. On an examination of the prints before fixing, no inequalities of colour of the nature of double-tones could be detected, nor were any signs of stains visible.

No alteration in the appearance of the image either as regards vigour or quality of tone was apparent when the prints were removed to the hyposulphite bath.

The finished proofs were of a high standard of excellence, and were much admired. The tone, it should be added, bore considerable resemblance to that produced by means of the benzoate-phosphate bath.

No. 13. The Oxalate Bath.—Some experiments were then made with a toning bath of a simpler description. The salt selected for its preparation was sodium oxalate, and the formula employed was that given below:—

Sodium oxalate	24 grains.
Chloride of gold	0.5 grain.
Water	8 fluid ounces.

When the washed prints were transferred to the toning bath some minutes elapsed before any change in their appearance could be discerned. When at length the gold began to deposit itself, the resulting tone, a crude brick-red variety of brown, was far from agreeable. With the object of improving the colour, the prints were allowed to remain in the bath for upwards of twenty minutes from first to last, but little further change was perceptible in their appearance. Another objectionable feature that was apparent was the prevalence of double-tones, and the prominent character of these blemishes. The disfiguration in question took the form of large patches of red, which, by reason of the arbitrary manner of their distribution, were particularly noticeable.

In the first stages of fixing, bleaching ensued to a remarkable extent, and the red tone of the image underwent a transformation to an ochre-yellow. Simultaneously, the double-tones assumed a canary yellow hue, which rendered them still more conspicuous. The changes thus effected were not, however, of a permanent character, and after fixing the prints were found to have regained their red-brown colour, and much of their vigour, while the stains, though still visible, were not now so prominent as to arrest the eye. After washing and drying the harshness of tone was not so apparent, but the general effect was unsatisfactory owing to the loss of vigour which the prints had sustained.

No. 14. The Oxalate-Phosphate Bath.—The last bath whose properties were the subject of investigation in the present series of experiments was a combination, containing an oxalate and a phosphate. An addition of 24 grains of disodic orthophosphate was made to the recently employed bath, No. 13. The salt having been dissolved, and the customary preliminary manipulations having been completed, the toning operations were proceeded with. In the space of two minutes the image assumed a scarlet hue. After this the alteration in tone was effected very gradually. A quarter of an hour's immersion produced a crimson shade of brown. As faint red stains were beginning to appear, it was thought well to remove the prints at this stage from the bath. On their immersion, after washing, in the hyposulphite bath, the quality of the tone was greatly improved. The colour produced was a chocolate brown. The image gained considerably in richness and warmth during the operations of washing and drying. No traces of stains were visible in the finished prints, these having quite disappeared when the proofs were transferred to the fixing bath. Al-

together, the results, both in point of technique and in respect of their æsthetic qualities, were highly satisfactory.

At the conclusion of the series of experiments the prints of each batch were brought together, carefully compared, and arranged in four classes according to order of merit. In forming an estimate, in order to simplify matters, only three factors were taken into account, viz., quality of tone, gradation of tone, and vigour, no attention being paid to minor defects, such as stains, double-tones, &c.

The prints were classed as (1), excellent; (2), good; (3), moderately good; and (4), unsatisfactory.

After due deliberation the order of distribution adopted as being the fairest was as follows:—

Class.	Prints toned in Baths.
1	Nos. 9, 10, 2, 5.
2	Nos. 8, 14, 4, 11, 12.
3	Nos. 6, 7.
4	Nos. 13, 1, 3.

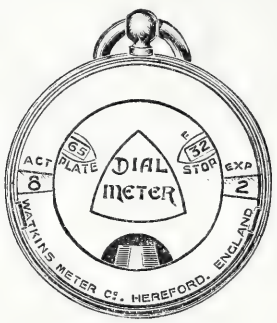
MATTHEW WILSON.

Our Editorial Table.

THE WATKINS DIAL EXPOSURE METER.

Manufactured and sold by The Watkins Meter Company, Hereford.

IF not differing either in actual method of use or principle from the other meters with which Mr. Watkins' name is identified, there are some novel points of detail in the little instrument before us which will be appreciated by those with whom the minimum of trouble in making exposure calculations is a thing to be sought. The plate, f-16 stop, actinometer, and exposure data, it will be observed, are obtained by rotary movements controlled from the face of the instrument. A blue film facilitates the matching of the tint, and, as usual,



the chain can be used for timing seconds. Revolution of the back case of the instrument admits of the movement of the sensitive paper. As Mr. Watkins points out, no figures are in sight except those in use. For the purpose of calculating exposures the instrument is the acme of simplicity. The plate and stop numbers being set, the revolution of the glass face practically "does the rest." Of gentleman's watch size, the dial meter is finished in nickel. The engraved stop values range from f-5.6 to f-40, and the range of plate speeds from 11 to 500.

Studio Gossip.

PORTRAITURE in Sydney (N. S. W.).—"The class of portraits now in greater demand here," writes the editor of "The Australian Photographic Journal," "are platinum and warm-toned bromides; the latter, in the case of several professional establishments, are toned perhaps by original formulæ, and called by fancy invented names: however, our purpose is only to show the superior appreciation of the Australian public for things quiet and in keeping with the feeling of art against the hitherto favoured highly burnished or enamelled albumen and P.O.P. prints with strong contrasty effects, which, we are glad to observe, are retiring with the fashions of yesterday."

PHOTOGRAPHY and Education in the United States.—Our contemporary, "The Photo-Era," gives the following interesting particulars of the employment of photography in American higher education:—"There is a course of thirty lectures on photography each year at the Massachusetts Institute of Technology, Boston, open to third and fourth-year (junior and senior) students, attendance on which is optional. These lectures are devoted to the physics and chemistry of the processes of pure photography and are fully illustrated by experiments. In the Ohio State University, Columbus, Ohio, since 1890, photography is a required study in architecture, civil, mechanical, and mining engineering courses, and an elective in the general science course. Professor Bradford advises that the instruction consist of lectures and practice in exterior, interior instantaneous, colour screen (orthochromatic), tele-photo, copying, micro photography, printing (different methods), and lantern-slide work. A the University of Rochester, New York, there is a course of three exercises per week, two hours per exercise, and given each alternate year It comprises: 1. The principal processes employed in photography 2. One section per week on the Optics of Photography. At the University of Chicago, photography is taught in the department of physics, because it is considered a necessary accomplishment for those who make physic their speciality. The course is confined to scientific uses only, such a spectrum work, micro-photography, slides, &c. At the University of California there are three exercises, of three hours each, on the construction and use of the camera, exposing and developing plates and making blue prints—being part of a course in laboratory physics which is required of all engineering students. At Cornell University, N.Y., practical photography is taught in lectures and laboratory practice, to students who have the requisite knowledge of chemistry and physics. There is also a course in advanced photography with special reference to its application to research work. At the U.S. Military Academy at West Point a large number of Cadets have and use cameras. Two of the academic departments have complete photo-laboratories, and photography is in constant use to illustrate lectures.

THE German Emperor and His Photographs.—"One who sees William II. of Germany for the first time is curiously impressed with the influence of the comic paper. He discovers that his imagination in picturing the Kaiser has followed the exaggerations of the caricaturist rather than the sober reality of the photograph, for the German Kaiser is not at all what his caricaturists make him. In the first place, he is not a large man, neither tall, nor broad of shoulders. Somehow it is the natural bent of the human mind to associate majesty with physical bigness. I believe the old Egyptians represented their Ptolemys and Rameses as giants. And the Kaiser, who knows the psychology of royalty to the seventh shading, has built high on this feeling. Any one of the seventy-eight royal photographers, more or less, in Berlin, will tell you how carefully he always arranges the groupings when he is to have his picture taken in company with others," writes Mr. R. Stannard Baker, in a recent number of "Pearson's Magazine," "and a study of the resulting photographs will show how, almost invariably, he looms tall above the shorter men who surround him. A favourite picture represents the Kaiser standing side by side with the famous artist, Mengel, whose four feet something of stature gives his companion the frame of a Goth. In one of the galleries there is a portrait of the Kaiser in full naval unifrm, standing on the bridge of one of his ships of war. The canvas, which is so hung as to strike the visitor as he enters the doorway, is of enormous size, the figure of the Emperor stands out of it with gigantic impressiveness. Even in many of his smaller pictures, the cabinet photographs, the camera has been moved so close that the Kaiser's face nearly fills the plate, thereby giving an extraordinary impression of highness. The caricaturists have naturally exaggerated the suggestions given by these various portraits, and it is with something of a shock that one realises, for the first time, that the Kaiser is, after all, only a man of common stature or less. In other ways also, a first view of the Kaiser impresses one. A photograph gives no hint of colour. The Kaiser is a brown-faced man, the brown of wind and weather, of fierce riding on land, and of a glaring sun on the sea. His face is thinner than one has pictured, and there is a hint of weariness about the eyes. His hair is thin, and his famous moustache is not so long nor so jauntily fierce as one imagined. There is many a clerk in Berlin who has out-Kaisered the Kaiser in growing a moustache."

WHY are so many professional photographers unsuccessful?—"The amateur photographer, as a rule, finds the occupation of picture-making so fascinating that he is often looked upon as a 'crank' by those of his friends who do not find interest in matters pertaining to the art. It is little wonder that it is by and through the amateur who has taken photography from selection, often actuated by an inborn artistic taste that the great strides in invention and improvement in the photographic art have come instead of from the professional, who is often the victim of condition, having either inherited the business or taken it up as an easy means of livelihood, and who is generally satisfied to plod along in the old rut cut-out and left for him by his predecessors. Before my interest in amateur photography led me into closer contact with professionals," writes Mr. H. G. Reading, in "The Photographic Times" (New York), "I used to wonder why so many of them made such absolute failures of their business. There are few trades that seem to hold out more possibilities for success or better promises of money-making. The demand is constant; the profits are large; the work is clean, pleasant, and light; and yet while tradesmen all around the neighbourhood of the gallery are getting rich, our friend the artist of the sunlight too often seems to be having a hard row to hoe, many in the smaller towns doing little better than eking out a hand-to-mouth existence. Let us look for the cause, or, as the doctors might say, the 'complication' of causes that is responsible for this condition. I think that the underlying cause of the failure of most people who do not succeed in their business is lack of proper sympathy with or love for their work. The proper amount of love for one's business will inspire energy to be constantly seeking after improvement in method and inquiry after every cause of failure. If a man cannot love his adopted business, he ought to get out of it and get into some other that better suits his capacity and let some other fellow make a success where he has made a failure. One day during the summer of 1893, meeting a photographer who had just returned from the World's Fair at Chicago, and wishing to learn of anything new or novel in apparatus that might be on exhibition, I began questioning him as to what he saw in the photographic section, and was astonished to learn that he did not go near the department devoted to his own business at all

you should ask any successful business man how he would run a photo-
aph gallery, he would tell you that he would apply the same business
nciples to it that he had applied to the business which he made bring
cess to him; which means that he would put conscience in his work;
ster technical methods; study art laws and apply them; be prompt
l courteous to all; sacredly maintain his credit with the trade, and never
eive or disappoint a customer. Solomon must have been waiting on
court photographer to deliver some portraits when he heralded his dis-
very that all men are prevaricators, and notwithstanding all the good
vice that Solomon wrote for the betterment of mankind the conditions
ve changed but little since his day. A photographer may be sincere
I think he is telling the truth when he promises to deliver work at a
ted time, but the party who calls at the time specified and finds it not
dy, and has to climb the stairs daily for another week before he gets it,
not always charitable enough to believe it. Of course, the photographer
ways offers an excuse, and he, no doubt, believes that he has legitimate
uses. Too often he allows himself to get out of printing paper, mounts,
chemicals. But is there any legitimate excuse for ever being out of any-
ng? Never. Suppose you wished to take a train, and when you went
the station you were informed by the agent that the train would not be
ng to-day because the company had failed to provide coal for the en-
ne. There is no more reason for a photographer getting out of any of
e requisites for his business than for the railroad. I have known photo-
aphers so poor and shiftless that they had to buy paper a gross at a
ne, and have it come to them C. O. D., and they bought plates and
unts from a retail dealer by the dozen or piece as needed. They
ought they had to do business this way because they were poor.
t so. They were poor because they did business this way. Thanks to
e modern photographic conventions, the more ambitious professionals
e waking up and showing improvement in both work and business
thods, and it is hoped that this influence, together with the influx
m the ranks of the amateurs of many who love this work for the work's
ke, will entirely lift from professional photography the business odium
at the shiftlessness of so many of its followers would heap upon it."

News and Notes.

Messrs. W. and D. Downey, of 61, Ebury-street, London, S.W., who
ve been Court photographers for nearly forty years, have just been
pointed photographers to His Majesty the King.

Deal.—A well produced and illustrated souvenir of this favourite sea-
e town on the south coast, has been issued by the Health Resorts De-
opment Association. It includes a special article on the Deal fishing.
copy may be had post free by addressing the Town Clerk, Deal.

Exhibition at Widnes.—An exhibition of paintings, water-colour draw-
s, photographs, engravings, and other objects of art will be held in the
unicipal Technical School from the 2nd to the 17th August next.
try forms may be obtained of Mr. J. W. Towers, Honorary Secretary
the Widnes Photographic Society, Widnes.

"Rhineland," published at 30, Fleet-street, London, E.C.—This little
ok describes and illustrates fresh holiday districts in the little-known
e valleys of the Rhine. It is pointed out that leaving London in the
ening, and the chief northern and midland towns in the afternoon, it
possible, at small expense, to reach some of these valleys early the
llowing afternoon, via Harwich and the Hook of Holland.

"One Hundred Gems of English Scenery," is a new monthly publica-
n at a shilling a part. The illustrations consist of collotype prints from
gatives of well-known places of scenic and historical interest, Windsor
d Durham being amongst those represented in the part before us.
e publishers are the Graphotone Company, of Enfield, and 2, Maclean's
ildings, London, E.C., whose venture deserves every success.

"The Eastman Building, the gift of Mr. George Eastman to the
chanics' Institute, Rochester, N.Y., was recently opened with appro-
ate ceremonies," says "Wilson's Photographic Magazine" for June.
fter the formal opening the building was given over to a series of
blic entertainments, covering six days, so that the people of Rochester
ght have abundant opportunity to make themselves familiar with the
ilding and its splendid work. We learn that the affair was a grand
cess, all classes co-operating to express their appreciation of Mr.
stman's generosity."

Messrs. Hutchinson and Co., the publishers of "The Living Races of
nkind," have now embarked upon a companion work to be called
"he Living Animals of the World," which will be issued in fortnightly
rts. The new work will be a comprehensive natural history written by
e highest authorities on what is claimed to be an entirely new plan,
e feature being that the illustrations, of which there will be about
00, including a large number of coloured plates, will be exclusively from
otographs collected from all parts of the world, whilst another feature
l be that the work will be free of all scientific names and expressions,
e intention being that the work shall be "popular" in the widest sense.
rt I. will be ready on July 15.

Cameras in Self-Defence.—Wherever royalty of any nation visit, they
e sure to be beset by the ubiquitous snap-shotter. Some do not object,
t some do, and sometimes they adopt some little strategy to foil them.
re is the latest we have heard of. In the "Globe," of Saturday last,
read that when the King of Portugal recently visited Madeira he
s besieged by photographers anxious to get a snap-shot of the royal party. Whenever his Majesty noticed this, he whipped out a Kodak of his own and promptly snap-shotted the snap-shottist. It would be not a little interesting to learn which pictures proved the most interesting to those who secured them—those taken by the King of nobodies, or those taken of the King snap-shotting with his Kodak?

Tally Ho!—This great hunting spectacle at the Hippodrome has recently been successfully cinematographed, and the pictures are now being shown on the screen at some of the provincial halls. Of course, such an achievement has been going the round of the press, and, as usual, with some extraordinary statements as to how the thing was accomplished. It is said that the electric light employed was equal to half a million candle power. One account mentions that a portion of this large volume of light was obtained from "forty arc lamps of forty thousand ampères each." It would be interesting to learn the construction of these forty arc lamps which would carry a current of forty thousand ampères, and how that current was obtained at the Hippodrome on this occasion. One reads of strange things at times.

We have received the Thornton-Pickard Manufacturing Company's album of half-tone reproductions of photographs that were successful in the company's last competition. Some data anent the latter may be of interest to intending entrants to the next competition which closes on October 1, next:—"About 1000 prints were sent in, and the standard of excellence showed a marked improvement on those entered in the competition of 1898. Several of the highest prizes were taken by lady amateurs, who contributed a full share of the best entries, and whose pictures were conspicuous by their taste and refinement. Many photographs taken with the focal plane shutter which were excellently conceived failed to take prizes because of their lack of proper form or because of incorrectness of exposure. Notwithstanding this, a large number of excellent photographs of moving objects were sent in, which shows that an ever-increasing number of photographers are turning their attention to this phase of photography, and are meeting with marked success."

More Arctic Expeditions.—The "Standard's" Berlin correspondent, telegraphing on Friday last, says that the Swedish Geodetic Expedition to the Arctic Regions, which was unable to finish its astronomical and topographical work last season, or account of unfavourable conditions of the ice, will make another journey this year. A list of the names of the scientific staff is given, and amongst it is that of Dr. Rubin, of the Upsala Observatory, who will, of course, undertake the astronomical work. The correspondent also says that the Relief Expedition, fitted out by the Duke of Abruzzi is to start, shortly, for Franz Josef Land, where a search will be made for the three men who disappeared during the sleigh expedition. The ship Capella is to be taken to all parts of the Franz Josef coast, and search expeditions are also to be sent into the interior. With all these expeditions to the Arctic regions, aided as they are by photography, we, who stay at home, should, in time, become as familiar with them as those who visit them, though, at present, comparatively few have seen the pictures that have been secured.

Development in Hot Weather.—Messrs. Cadett and Neall, of Ashtead, have issued the following hints on the development of their plates:—"Warm or cool your developer to sixty-five degrees Fahr., as the temperature may necessitate. Pour the developer over the plate in one sweep along the edge. If poured in the middle of the plate towards one side, the developer will form a line of developing bubbles on its return flow and these cannot be got rid of without rubbing the film. There is also danger of these bubbles forming when a small quantity of developer relatively to the plate is used, as the film is apt to become partly uncovered for a few seconds, and bubbles are formed on the film when the developer flows over afterwards. Do not wet the film before development. Use plenty of developer, and use what we recommend. To dry quickly, our plates being very heavily coated, after washing soak in methylated spirit, sufficient to cover the plate for about twenty minutes, then pour off the spirit, remove the surplus moisture from both sides of the plate with some soft material, and leave for a few minutes to thoroughly dry. In case the plates should be found giving surface green fog, in using ammonia, this can easily be removed by placing the negative, after fixing, in a fresh solution of hyposulphite of soda of the same strength as the fixing bath to which a few drops of saturated solution of ferridcyanide of potassium have been added, so as to make the hypo solution of a light lemon yellow colour. Care must be taken, however, not to add too much of the ferridcyanide solution so as to affect the density of the negative."

"The Stereoscopic Photograph."—With this title Messrs. Underwood & Underwood, of London and New York, are issuing an illustrated magazine which is devoted to advocating the charms of stereoscopic work. With each copy an original stereoscopic print is enclosed. We cordially welcome the new-comer and trust that it will be the means of popularising a beautiful but neglected branch of work: In a preliminary note the publishers say:—"The scope of this periodical will include articles by eminent writers on various subjects, as a description of the different countries and peoples of the world viewed in the light of present-day facts; also the latest results of archæological investigations in the different lands where these are being carried on, together with explanations from time to time of the nature of the stereograph, the laws which enter into its construction and use, the benefits which may be derived from it, and the new methods of making and classifying the stereographs of a country. In other words, we shall aim to make this magazine most interesting and instructive, one which will be characterised by the highest literary and artistic merit, and therefore invaluable to the school and home. It is also our intention to insert an original stereoscopic photograph in each issue, one which has to do with some striking matter of present day interest or which is pre-eminently instructive in itself and occasionally to accompany this with an interesting article which shall look far into and

unfold its distinctive characteristics. We believe that in this way, we can best help our readers to see how much instruction and delight they can obtain from their stereographs, for if used properly we know that stereographs will contribute many a glad hour to their experiences, and furnish an equipment for life's battles which shall be most helpful and enduring."

COUNTRY Photographic Societies.—"Opticus" in the last number of the "Dioptric and Ophthalmometric Review," has the following remarks on country optical societies, and the apathetic manner in which they are supported. Much the same state of things prevails with regard to many photographic societies, particularly in regard to professional support. The observations of "Opticus" may be commended to the notice of country members of the Professional Photographers' Association:—"There is both a narrow-minded and a broad-minded way of looking at an Optical Society. Its inception is always more or less a severe trial to its formators. Let us take for example some large town or city in which there are, according to the directory, about twenty-five opticians. Some enterprising soul, with a taste for optical affinity, sets out with the view of inducing his brother opticians to combine, to meet in order to interchange ideas on optical business and ethical subjects; his labours usually meet with little success, for if he is a man of some influence and standing, the others will look askance at him, wondering whether he is not, after all, ping it for the advertisement that it is likely to bring him. If he is a small man with no other qualifications than that he has studied optics and is of energetic turn, the others will contemptuously turn from him. Suppose, however, that the small man is so energetic that he succeeds in gathering some fifteen to twenty adherents. If he does not happen to be extra energetic he will never get any further, inasmuch as the opticians outside the society will have selfish scruples for fear lest by joining they might be giving away their own knowledge to a body of what they might term 'outsiders.' My own experience of these gentry is that they are wofully and densely ignorant of some of the very first principles of the scientific side of their own business. I would not give a rush for the man who was so 'clever' that he could not learn some little thing by mixing with his fellow-opticians, even if they were his inferiors in business standing. I myself live in an ozonic atmosphere of refraction pure and simple, untainted by, and free from, the least suggestion or suspicion of any branch of optics that has not a relation to spectacles. Neither is my knowledge new-born, for it stretches back over a longer vista of years than I care to look back upon. There is little optical literature that I do not see—there is no theory, however wild, that I would not listen to—no instrument, however impracticable, to which I would not give a trial, and there are few theories that I have not heard and few instruments that I have not tried—and yet I have never yet attended an optical meeting, however small, from which I have not come away with something added to my store of knowledge either from a scientific or a business point of view. If, however, you or your business is so long established (for though you may have bought an old business but yesterday, you have all the feelings of an old optician) that you do not care to mix with the vulgar plebs and base canaille of an optical society newly formed, by all means stand aloof, and you will be rewarded by seeing the members of the society profiting by the exchange of ideas to make commercial headway in the town, and then you will wonder why these optical upstarts should have succeeded in taking away your trade! And your wonder will be further increased by the knowledge that your competitors are actually getting better prices than you do. Of course, they are doing better work, in better style, and giving better satisfaction; but then, as a highly-respectable long-established optician, you are so myopic, with such dim outward eyes and such subtle inward vision that you are too conceited to notice it. Suppose, however, still speaking to the old-established optican, that you consent to take an interest in this newly-formed body of opticians, you will possibly find a rare mixture, you will hear things said that will perhaps revolt your old-established optical sensibilities, you may come across unknown men who offend your susceptibilities—but, bless my life, it will do you a world of good! It does not follow that because, in a meeting, some man, of whom you never heard before, gets up to contradict you, that he is wrong and that you must be in the right! Listen to him, and if he is really wrong show him the error of his ways. If he happens to be right, be thankful—and take your thrashing quietly and with a contrite spirit."

Commercial & Legal Intelligence.

THE Axe Brand Showcard.—Printed in colours in celluloid, and mounted on tin support, the showcard issued by Messrs. Fuerst Bros., 17, Philpot-lane, E.C., should certainly be instrumental in drawing attention to the firm's specialities. It measures 10 by 5 inches, and is sent post free to photographic dealers on application.

THE Ilford Showcard.—An excellent example of good technical photography is attached to the new P. O. P. showcard just issued by Ilford, Limited. It is a gelatino-chloride print from a negative of a farmyard scene: suggestive of the style of Colonel Gale. The card itself, which measures about 19 by 13 inches, has the words "Ilford P.O.P." boldly impressed on a light grey ground, and is both attractive and in good taste.

THE Gripper.—The Eustace Manufacturing Company, of 306, Cleethorpe-road, Grimsby, has sent us a specimen oak frame made with the "Gripper," a simple mechanical device advertised in the outer pages the JOURNAL. The frame is exceedingly well made, and the corners a accurately joined together. If the piece of work before us be a criterion of what the "Gripper" can achieve in frame-making it deserv commendation.

AT the Mansion House Police-court on Saturday last, William K drick, aged 49, a firework manufacturer of 2, Ravenscroft-street, Hackn road, was charged with being concerned with A. J. Macintyre (t prisoner in the above case), in obtaining from Messrs. R. and J. Bec Limited, of Cornhill, a camera worth £12 12s., by means of a forg order, purporting to be signed by Messrs. Corbyn Stacey and Co., who sale druggists, of High Holborn, W.C., and further with attempting obtain from the same firm under similar circustances, three cameras, a one microscope, of the value of £42 11s. Detective-Inspector Holm gave evidence as to the prisoner's arrest, and said he admitted havi sold a camera. Upon him was found a newspaper cutting relating to t proceedings against Macintyre at the Clerkenwell Police Court. T accused was remanded, and the Lord Mayor declined to grant bail.

INFRINGEMENT of Copyright.—Last week Messrs. Henry Wilkes Green a William Wilkes Green, trading as Messrs. H. and W. Green, photograp printers, College-street, Rotherham, sued Fred. Strapps, photograp mount dealer, 47, Canal-street, Nottingham, for £2 damages for fringing the registered design of a photographic mount, and publishi the same. Plaintiffs also sought for an injunction to restrain defe dant from further infringement.—Mr. A. Barlow (acting on behalf Messrs. Oxley and Coward, Rotherham) appeared for the plaintiffs, a pointed out that only nominal damages were claimed, having regard defendant's pecuniary position, plaintiffs' object being to restrain defe dant from unfairly making and dealing in photographic mounts, which plaintiffs were the designers and patentees.—The plaintiffs ga formal evidence, and produced a registered copy of their patent. Th stated that defendant had made and sold their registered design, where they had sustained at least £2 damages.—Defendant denied that he h sold the mounts, nor had he made them on his own account.—His Honou But they bear the name of "F. Strapps." Are you not F. Strapp No, I am Fred. Strapps.—William Wilkes Green, one of the plaintif re-entered the box, and in reply to Mr. Barlow said he recognis defendant as the man who had traded as F. Strapps.—Defendant sa he had not traded on his own account since November last. Cross-e amined by Mr. Barlow: He had traded in Nottingham at 13A, Georg street, 47, Canal-street, and previously to that at Radford-road. present he was working as a journeyman for the firm of F. Strapps.—M Barlow: Have you made these mounts?—Defendant: I may have ma some of them, but not on my own account and I have not sold any. Who has sold them?—F. Strapps.—Who is F. Strapps?—Defendant d clined to answer, but was told by his Honour that he must reply the question, whereupon he said that F. Strapps was really M. Strap As the result of further questions by Mr. Barlow it was elicited th M. Strapps was really defendant's mother.—His Honour gave judgme for the amount claimed, with costs, payment to be made forthwith. perpetual injunction was also granted, his Honour warning defendant th he would find it dangerous if he resorted to trickery of the kind he h displayed in court.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
15.....	Walthamstow Photo.....	Ordinary Meeting.
16.....	Ashton-under-Lyne.....	Excursion: Ashford. Leader, Al Shaw.
16.....	Gospel Oak	Demonstration: *Enlarged Negat* Messrs. Morris & Palmer.
17.....	Borough Polytechnic.....	Monthly Print Competition.
18.....	Croydon Microscopical	Excursion: Riddlesdown. Conduct the Botanical Committee.
20.....	Borough Polytechnic.....	Excursion: Edgware and Stanm Leader, F. W. Bannister.
20.....	Croydon Microscopical	Excursion: Dorking. Conductors. Roods and J. H. Baldock.
20.....	South London	Excursion: West Drayton.
20	West London	Excursion: Thames—Greenwich Fer
20.....	Walthamstow Photo.....	Excursion: Zoological Gardens.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATIO

JULY 4,—Adjourned Annual General Meeting, Mr. A. Haddon in chair.

The evening was entirely devoted to the consideration of notices motion for the alteration of the rules, special legislation being in duced to define the extent of the word "arrears" in reference to scriptions, and to limit the privileges of members in arrears. It agreed to continue to support the affiliation of photographic societies.

Mr. T. E. Freshwater passed round an album of views of the re proclamation at the Temple Bar, respecting the coronation of t Majesties the King and Queen.

Prof. Stebbing, of Paris, made some observations on the present posi of photography in the neighbouring Republic with special reference the cheapening tendency and its effects.

PHOTOGRAPHIC CLUB.

y 3,—Mr. F. A. Bridge in the chair.

r. G. W. Tottem passed round a 12 by 10 enlargemnt on rough bromide er of a slow brand, the image on which was of a faint yellow colour lly to be distinguished by gaslight. The piece of paper was one of nty-four, all used on the same day, developed with fresh amidol solu- and fixed in fresh hypo solution. Each print had all the appearances properly organized bromide print on its removal from the fixing , and until within fifteen minutes of the first washing. After that, it t as shown, and so did the others except that four of them had hes, of the size of a crown piece, that were normal or black. Half- e pieces of the paper did not go wrong in this way although precisely same treatment was given.

uestions were asked as to the nature of the water used, whether the er floated or sank, and whether the image as shown was re-develop- ?

r. E. W. Foxlee asked whether the maker of the prints intensified negatives with mercury, because, if so, there may have been some of solution in the dishes and a bleaching action set up. A piece of the t was subjected to dilute ammonia, but there was no reaction that ld indicate the presence of any mercury in the image.

r. H. P. Smith ascertained that the prints were probably fixed and hed in a vessel that was not in his opinion large enough for so many ts. Papers that sank to the bottom never got a proper washing, would prints that were allowed to lie in a mass in a comparatively ll vessel.

r. G. E. Brown added that prints charged with hypo solution and w to dry exposed to the air would be surely subject to some degree bleaching.

he Chairman said that any suggestion that the means taken for the elopment of a silver image must have some influence upon the nature hat image, was one with which he could not agree. He held on the rary that the images were identical whatever reducing agent was d. The question was one either of fixing or of washing or both.

r. J. W. Mason held that improper washing was at the bottom of the ble. He had seen similar results when bromide prints had been put tanks to wash, and had been permitted to sink to the bottom in a s. Half of a pint covered by another had just this appearance while half to which the water had free access was good.

was generally agreed that the paper was not at fault, and that the on for the trouble was to be sought in the modus operandi of the ker of the prints.

Patent News.

following applications for Patents were made between June 24 and e 29, 1901:—

ERA FITTINGS.—No. 12,791. "Improvements in Camera Fittings and the like in connexion with Changing Apparatus." ARTHUR BROWN-RIDGE KERRY.

TTERS.—No. 12,812. "Improvements in Apparatus or Means for Releasing or Operating Photographic Shutters; applicable to other purposes." ARTHUR HENRY EDWARDS.

LULOID.—No. 12,863. "The Manufacture and Production of New Celluloid-like Products." (The Deutsche Celluloidfabrik, Germany.) JAMES YATE JOHNSON.

NTING APPARATUS.—No. 12,865. "Improvements in Printing Apparatus, principally for use with Photographic Processes." WILLIAM WALLIS.

ED SCREENS FOR COLOUR PHOTOGRAPHY.—No. 12,922. "Improvements in Machines for Ruling Screens or Plates for Photographic Purposes." Complete specification. DWIGHT KASSON TRIPP.

LULOID.—No. 13,058. "The Manufacture and Production of New Celluloid-like Products." (The Deutsche Celluloid-fabrik, Germany.) JAMES YATE JOHNSON.

TE LIFTER.—No. 13,064. "Photographic Plate Lifter and Holder." ERNST DAEGEL.

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice taken of communications unless the names and addresses of the writers are given.*

*** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SULTAN OF MOROCCO.

To the EDITORS.

ENTLEMEN,—Although the matter is not strictly photographic, I ight possibly some of your readers would be interested to have before them a few extracts from an article in the July issue of "National Review," dealing with the Sultan of Morocco, whose expensive tastes in the matter of cameras were described in last week's issue of your JOURNAL. The whole article (by Walter B. Harris) is very interesting and informing. "It is a common argument amongst the Moors," writes Mr. Harris, "that their Sultan is not aware of the extortion that his subordinates and officials are practising upon the population; but such an argument can hardly hold good, for just as the Governors of the district squeeze the general public, so they in turn are squeezed by the Court; and the Sultan must know that the fortunes that his officials amass, and that he confiscates, are extorted from the tribes." This is evidently a case of "when ignorance is bliss it is folly to be wise." We could all indulge in expensive luxuries if we could adopt these methods. Speaking of the Sultan's character, the author of the article says:—"He is very young still, probably not more than 20, and with all the temptations and want of restraint with which he is surrounded, it is little to be wondered at, though much to be regretted, that his pursuits are frivolous and ill-suited to the almost holy position which he fills. That he has plenty of intelligence there is no doubt. He has taken to photography with such a will that he obtains the most excellent results. He develops and prints his own photographs, and even mounts them himself—and very excellent specimens of art they are. He shows a great interest in all new inventions, and is not content in being merely shown their workings, but insists upon understanding their methods of production." The article extends to several pages of the review, and no attempt is being here made to summarise it. The author concludes with some remarks as to the future of Morocco. He says it is impossible to say much as to this; it is all a matter of speculation." He observes: "It need only be pointed out that, in the interests of all the Powers of Europe, it is necessary to maintain the status quo. The internal condition of the country is not satisfactory. The recent long series of arrests, imprisonments, and confiscations has disturbed the tranquillity of the governing classes, who do not know whose turn may come next, while it must be confessed that the young Sultan's European tastes have not increased his popularity. . . . There is little hope from Morocco from within. No reforms will be introduced voluntarily. Whether Europe could insist upon some amelioration in the condition of the country is too large a question to discuss here. The young Sultan is intelligent, but his intelligence wants guiding into the right direction. The Moors are the most Puritanical of all Moslems, and look upon the introduction into Court circles of a Spanish circus and French danseuses with indignant horror. It is not too late to put a stop to all this. The Ministers of the Powers should point out to the Sultan that the road he is pursuing is the road to his own ruin, and to the ruin of his country. So far from encouraging Mulai Abdul Aziz to spend his revenues in a search for novelty and a craving for the tastes of civilised Europe, it would be far better to turn him back again into a course of conduct compatible with his position, which would ensure him the devotion of his people and the respect of the whole world. It is the only hope for Morocco." Possibly the young Sultan will find salvation in the pursuit of photography. If he continues in the lavish way that he has commenced, the process may be somewhat expensive; and we might express the hope that he may be able to devise means other than confiscating property, whereby his expensive tastes may be gratified.—I am, yours, &c., J. A. R.

July 8, 1901.

A CONSCIENTIOUS SITTER.

To the EDITORS.

GENTLEMEN,—The enclosed quaint letter was received this morning from a servant girl, and if you think it worth reproducing in your JOURNAL you are at liberty to do so. If you do, please let the spelling remain as it is in the original, but leave out the name of the writer of it.—We are, yours, &c., ELLIS AND CO.

18, High-street, Sutton, July 3, 1901.

"I am writing these few lines to ask you if you mind leting it stay till I am paid it is now this month and then you will be sure to have it because I kept it until Saturday night and then I went to shop and paid for some frames with the mony I had for you so Sir if you could kindly wait til lthen I then send it on as soon as I am paid Sir not troubl and think you wont get it but I am like that I dont like to be in peoples debt myself Sir will you drop me a line if you cowld wait till then.—I am yours truly ———."

PHOTOGRAPHS REGISTERED:—

R. T. Watson, 70, Anlaby-road, Hull. *Photograph of group of the Oldham Football Team.*

A. W. Yallop, 198, High-street, Gorleston, Great Yarmouth. *Photograph of Mrs. Brown-Potter.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

HYPO.—There is, unfortunately, no longer any Photographers' Benevolent Association in existence to which such a case as yours could be referred.

H. WILMOT and J. R. C.—The fault is that the negatives are much over-exposed. You must bear in mind that the light is very strong, and highly actinic, just now.

ADDRESS WANTED.—W. S. writes: "Will you kindly put me in communication with the maker of the 'Luxfer Prism Glass,' mentioned two weeks since in your JOURNAL?"—In reply: The address of the Company is 16, Hill-street, Finsbury, E.C.

ENAMELLING PRINTS.—G. writes: "Will you kindly give details of the best methods of producing a high enamel on large quantities of silver prints? Time required is a consideration. I am not acquainted with the collodion enamel process."—See reply to "Mere."

THE REGISTRATION OF PHOTOGRAPHS.—L. B. BRADSHAW writes: "Please say cost of registering photograph, and who to send same to? Print mounted or unmounted?"—In reply: Please send our publishers two unmounted prints, and one and sevenpence, and they will effect registration for you.

YELLOW STAINS ON PRINT.—"PYRO" writes: "I would esteem it a favour if you can tell me the cause of the yellow stains in enclosed print; they are more perceptible when print is damp."—In reply: Simply imperfect fixation. Either the prints were allowed to stick together while they were in the hypo, or that was too weak, or insufficient time allowed for its action.

BOOK QUERY.—"JOHANNES" writes: "What handbook could you recommend for an amateur who has had some small experience in photography, but who wishes to have a more complete knowledge of the subject?"—In reply: Probably "Science and Practice of Photography," by Mr. Chapman Jones, would suit our correspondent. But we should be better able to advise if we had more definite ideas as to the experience he has had.

ALBUMENISED PAPER.—G. A. GOUGH writes: "Is there any one who now supplies unsensitised albumen paper? I have applied to several chemists who make a feature of photographic materials, and none of them keep it, and they say it is not sold now, but they could procure me some ready sensitised."—In reply: All the large dealers supply it, though possibly it may not be stocked by the smaller ones. Apply to such houses as Marion's, Houghton's, Griffin's, and the like.

COLLODION POSITIVES.—G. BIDGOOD says: "I have nearly two pints of enamel collodion. If I were to iodise that with the iodide of cadmium, bromide of ammonium, and alcohol, as given on page 1074 of the ALMANAC, would it do for glass positives?"—In reply: No, it would be quite unsuitable. The pyroxiline used for enamel collodion is of a different character from that required for either negatives or positives. Furthermore, the collodion, with the further addition of alcohol, would not give the structureless film that is necessary for positives.

STAINS ON FINGERS.—"METOL" would like to know if we know of anything that will take the stains off the hands and nails: "I am developing contact prints all day, and my nails are black and my hands are very brown. I wash my hands well with hot water with no effect. Should like to know if it will hurt the skin?"—In reply: Metol acts very injuriously on the skin with some persons, causing painful results. Probably the brown stain on the skin can be got off with pumice stone, or by rubbing it over with chloride of lime. If the nails are badly stained we do not know how the stains can be removed.

TRANSFERRING GELATINE FILMS.—R. G. writes: "Can you suggest any satisfactory method for transferring the gelatine films of Kodak negatives from their celluloid supports on to glass? I am constantly finding that my best negatives happen to be on celluloid, which is faulty, either owing to scratches or to joints in the strips, and although these do not show very much in contact printing, enlargement becomes almost impossible. The usual text-book formulæ all relate to glass negatives, and though hydrofluoric acid is, no doubt, very effective with them, it does not attack celluloid."—In reply: One of the methods used for glass negatives is to soak them in a dilute solution of carbonate of soda, and then in very dilute hydrochloric acid, that will answer equally as well with the films. Probably the best way with these thin films would be to dissolve the celluloid away entirely in amyl-acetate, or a mixture of that and methylated spirit. The film can then be transferred to the glass.

A BUILDING QUERY.—"PERPLEXED" writes: "I have recently erected property and occupied same some nine months; the printing yard is overlooked by two windows which are ten feet away from my wall. As the windows were there when I came can I erect a hoarding on my wall in front of them?"—In reply: You can put up anything you like on your own premises, supposing it does not interfere with your neighbour's ancient lights. Whether you can erect the hoarding you propose depends upon the time that the windows have enjoyed an uninterrupted light. A period of twenty years confers the right, "Ancient Lights."

STUDIO.—"SOUTH LIGHT" says: "I can have an excellent position for business (portraiture), but the only place I could build the studio is where it would be lit with a direct south light. I am a fairly good photographer, having had fifteen years' experience in operating, but never in a studio with a south aspect. Do you think it is possible in such a studio to produce high-class work?"—In reply: Yes, certainly; but you will find it a little more trouble to work, at the beginning, than it was in the studios you have been used to. We should advise you to have the studio glazed with ground glass, and, also, have the means of well ventilating it during the summer months.

STUDIO-BUILDING.—T. CRAMPTON writes: "Could you advise me as to the best way of improving the light of the room (sketched), by the use of the Luxfer prism glass? I want the room for a photographic studio, which would be the best part of the room to place the sitter? Please give name and address of the firm that supplies Luxfer glass."—In reply: Sitter should be placed at the western end of the room. As we do not know to what extent the light is obstructed at the north window, we cannot say the kind of prism glass that would be best. Better write to the Luxfer Glass Syndicate for samples, and, at the same time, give them a description of the buildings outside the room. The address is 16, Hill-street, Finsbury, E.C.

ADDRESS WANTED, &c.—"MERE" asks: "(1) For the address of Kershaw photographic dealers in shutters. (2) Instructions how enamelling is done on photographic mounts, and then embossed."—In reply: (1) Mr. Kershaw has been dead, we believe, for many years. (2) First treat a well-cleaned glass plate with French chalk, and then coat it with enamel collodion. When that is set, place it in water until all the ether and alcohol is washed out—known when all 'greasy' appearance has gone. Then immerse the plate and print in a five per cent. warm solution of gelatine, avoiding any bubbles, and well squeegee together. When partially dry squeegee on a piece of backing paper, prepared for the purpose, and sold by all dealers, and allow to dry. Strip off and trim, and then emboss, and finally attach to the mount with glue applied round the edges.

AGREEMENTS.—"METOL" writes: "Seeing your correspondent's ('X.Y.Z.') query in last week's JOURNAL, re agreement not having been stamped, and reply in which you say it does not stand good to either party I may say my case is very similar. Some four years ago I took a situation as managing operator, and after going on trial and giving satisfaction had to sign an agreement not to commence business in the same town under a penalty of £250. The agreement was not stamped, but signed by both. I shall feel greatly obliged if you will kindly let me know whether my agreement stands good or not?"—In reply: The agreement is of no good as it stands, as it is unstamped. But it can still be stamped upon payment of a fine of ten pounds, in addition to the stamp that would have been required in the first instance. Then the agreement will become valid.

STUDIO EXPOSURES. — "PUZZLED" writes: "Last Saturday I had occasion to take a group of four children in the studio. It was a splendid bright day, and I used a small stop and I exposed as quick as I could take the cap off, and on again, but the plate was considerably over-exposed. I took several of the same pictures with the same unsatisfactory result. The puzzle to me is the next sitter, taken immediately after the group, was nicely exposed, in fact, I gave it twice the exposure, and they were both developed in the same manner with pyro-ammonia developer. The lens is a Dallmeyer portrait lens."—In reply: Many things may account for it. Most likely the light had changed between the two exposures, particularly as you say you gave double the exposure in the last case, and that was right. A mistake may have been made in the stops, or the last plate exposed was not of the same rapidity as the others, &c.

COPYRIGHT.—C. T. writes: "A photographic view dealer in this town arranged with me for use of copyright negative for the purpose of obtaining collotype prints, I agreeing to accept one gross out of 500 as consideration. The man he—the dealer—sent negatives to made the block, or had it made elsewhere; but when written to complaining of delay in return of negative, wrote regretting that it had got broken. He offers to replace negative by copying; but as I am not disposed to accept that I have written him claiming two guineas compensation for loss of copyright negatives and order. He refuses to deal with me in the matter as negative was sent by dealer. He also, through dealer, speaks of my claim as absurd. must say that I did not even obtain my 144 copies, as by some mistake, with which I have nothing to do, the block was made quarter-plate size, instead of whole-plate."—In reply: Your remedy is in the County Court, but you must proceed against the one to whom you lent the negative, the one you dealt with. You have no claim on the third party.

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EX CATHEDRÂ.

Acetylene Apparatus. Acetylene has not realised all the expectations that were formed of its future usefulness to photographers when the discovery of a practical method of producing it on commercial lines was first announced. Possibly this has been due rather to the exaggerated, but indefinite, notions concerning its applications that every real novelty is sure to give rise to, than to any actual shortcomings or difficulties. But, though in photography it has not succeeded in creating any great demand, acetylene has steadily pushed its way in many other directions, and undoubtedly its usefulness will be increasingly recognised as means are invented for applying it to purposes which require special appliances to adapt it. Messrs. Thorn and Hoddle, of 135, Victoria-street, S.W., who were among the first in the field to exploit acetylene, have had occasion to move to larger and more convenient premises at the address above given, and upon a recent visit we found that though as might be expected, the trade is principally in installations for ordinary lighting purposes, there were several arrangements on view for applying acetylene to scientific and other uses which are more or less novel. We may say that various improvements have been introduced into the well-known "Incanto" generator, which seems to be thoroughly reliable and automatic. A useful piece of apparatus, where acetylene is burned, is an improved form of boiling or cooking stove, in which the Bunsen principle of burning a mixture of gas and air is adopted, as in the ordinary stove for coal gas. A difficulty in applying the principle with acetylene has been in preventing firing back and a slight explosion, annoying though harmless. We satisfied ourselves that in the improved form this difficulty has been effectually overcome. Indeed, we tried vainly to produce an explosion. The same principle has been applied to the ordinary upright tube Bunsen burner for the laboratory. The property of the acetylene flame of being, to coin a convenient word, unblowoutable, renders it particularly suitable for outdoor illumination, and thus the adaptation of it to a signalling lamp for army or other purposes seems apposite. The lamp we saw in action struck us as being thoroughly practical, and, including its generator, sufficiently portable. A more simple arrangement for stage illumination had every desirable adjustment. One more novelty we may refer to is a burner for ordinary lighting with a bye-pass, a convenience which, in some situations, is a most desirable one. Messrs. Thorn and Hoddle are now experimenting with a view to the use of acetylene with an incandescent mantle. There are some minor difficulties to be overcome, but as far as the amount of light obtainable is concerned we had ocular proof that acetylene puts coal gas in the shade. The adaptation of acetylene to the optical lantern and as a studio illuminant for portraiture are too well known to need further reference.

* * *

English Dry Plates. The English dry plate has secured a high reputation throughout the world for cheapness and excellence. But for protective tariffs in foreign countries there can be no doubt that the business would acquire still larger proportions than at present, notwithstanding the perishable character of the sensitive film. On the

14th of last month we drew attention to the fact that an important firm of dry-plate manufacturers in Germany had been compelled to increase its prices, the difference being 3d. per dozen upon the popular size, 9×12 cm., which is rather larger than our quarter-plate. The fact should be an incentive to English manufacturers to popularise their dry plates in Germany. We now notice that the tears of the German photographic press are being drawn by another circumstance, which is also well worth the attention of our dry-plate makers. A new Customs Tariff is in course of arrangement in Germany, and it is probable that the duty on glass will be raised. It now stands at 6 marks per 100 kilos, which is about equal to 3 marks for ten square metres of dry-plate glass. By the new tariff it is proposed to fix an arbitrary weight of 70 kilos per 10 square metres for all kinds of photographic glass, and duty will be payable accordingly. This means an increase of about 40 per cent. in the rate. Imported dry plates, doubtless, will have to bear the higher rate, but as German manufacturers have to draw their supplies of glass mostly from this country and Belgium, the duty is not discriminative so far as the trade in the German home markets is concerned. But it appears that two-thirds of the plates made in Germany are exported, and if this increase has to be borne by the manufacturers to encourage the national glass industry, it must give other countries an advantage in foreign markets. The English manufacturers should not be slow to seize it.

* * *

An International Congress. The twenty-third Congress of the "Association Littéraire et Artistique Internationale" will be held at Vevey (Switzerland) on August 7 to 13. The following programme has been drafted:—

1. Proposed revision of the Berne Convention.
2. On the position of legislation in various countries from the point of view of the Berne Convention.
3. A comparison of the Berne Convention with that of Monte Video.
4. Publishing agreements and German legislation.
5. The right of property in artistic work from the point of view of dramatic art.
6. On the execution and reproduction of work by mechanical apparatus.
7. The constitution of an international tribunal for literary and artistic property.
8. Creation of an international juridical Lexicon.
9. The history of the protection of copyright in various countries during the nineteenth century.

The subscription for participation in all the proceedings of the Congress is fixed at 20 francs. There are several points of importance to photography in this programme, and the proceedings should be watched by all whose interests are affected by international legislation concerning literary and artistic work.

* * *

P.O.P. in Hot Weather. Given freshly and accurately made solutions, paper which is recently from the makers, clean dishes, fingers, and utensils, and there is no simpler operation than that of toning P.O. prints; beginners cannot be too frequently warned that accurate and methodical working is essential to complete success in this, as in oth photographic processes. Another point too frequently f gotten is this: although P.O.P. is a generic term used see ingly to cover various makes of gelatino-chloride paper, does not follow that these papers are all, or even any t of them, similar in manufacture; in other words, the tre ment which is found best for one brand, or it may be mo than one, is not necessarily that which succeeds best wi the remainder. If we look through the toning formulæ, supplied with these various papers, we note some variatic for which there is, no doubt, very good reason. The exp may with his one bath produce very good results with thr or four brands of paper, but it does not follow that the us generally will be as successful, indeed in our experience t young amateur is likely to make a mess of it. We ha more than once heard dealers say, "You will have no dif culty in toning these papers (referring to P.O.P.); they a all alike, and one is as easy to tone as another." This scarcely the fact, and is not fair to the customer, who, fo lowing on the old lines probably, fails with the newer pap to get quite such good results as formerly. The difficulty intensified when, as often happens, the amateur, instead making up his own solutions, trusts to someone else to c this; some one, moreover, who knows little or nothing abo the matter himself, or is in no position to offer any advic It is a fact that many amateur workers, in all good faith and merely to save trouble, look upon formulæ as so man prescriptions, to be safely cut out, and sent to the neare chemist to be dispensed. We know of one instance whe the well-known formula for Edwards's glycerine and pyr developer was copied out and handed to a chemist to compounded, and the photographer, to his bewilderment, r ceived in due course one of those blue-fluted poison bottle dear to the pharmacist, neatly labelled, "The Lotion, poiso to be used as directed." There is some excuse, of course, t one unfamiliar with photographic processes and formula In the years anterior to the great amateur influx, the chemi might very reasonably regard such a recipe as somethin applicable to a form of skin affection; but why, one natu ally asks, when there are dealers in plenty, and so man chemists stock and sell photographic chemicals, go, as seems deliberately, to one who does not profess to tou this class of chemical?

* * *

Some Causes of Double Tones. We were shown recently, by a recru in the photographic rank and file, batch of P.O. prints which demonstrated some remarkabl effects in the direction of double and other tones. Ou friend, on request, brought out his toning bath, which turne out to be a concentrated solution of gold and sulphocyanid carefully put up by his druggist, blue poison bottle, &c., a complete, but no directions for use attached. No harm, c course, would have resulted from this, and certainly no blam could be laid on the compounder, but our amateur faile entirely to get any good tones, although, as he put it, he ha used the solution "diluted with water, and finally in its co centrated form," and was inclined to blame paper, tonin solution, and chemist impartially. We improved upon h results considerably, and, with another make of paper, g some beautiful prints, proving not only that the solution w all right, but also, which we knew before, it was not quite th best formula for the paper which our friend had been usin P.O. papers have attained (all of them) a high degree of e

lence, but there is with them a variation in keeping quali-
s and sensitiveness. This variation is not perhaps very
nounced, but is unmistakable to those who have had much
perience of them during the last few years, and at all
ies and seasons. Particularly is this variation noticeable
en prints have been made purposely for development. If
s extra sensitiveness be granted, it sufficiently accounts
certain variable, not to say erratic results, not always
be attributed to inexperienced manipulation, so much as
use of a bath which is not the best for the purpose, not
scribed exactly, but not recommended by the makers.

* * *

t Weather ecautions. With the advent of hot weather difficulties in printing with P.O.P. are likely to be more quent; but there is no doubt those difficulties are easily to surmounted by remembering a few simple points, such as following:—Use a paper which is known to keep fairly ll, not a paper which is recommended as suitable for velopment; let it be as fresh as possible, carefully stored d handled, not exposed to even moderate daylight more n absolutely necessary either before or after printing; id unnecessary delay in finishing the prints; tone oftener, necessary using a bath as prescribed by the makers; to h bath may be added, as tending to make it more easily rkable, a grain or two of sodium sulphite (equal to the ount of gold present, but dissolved and added separately). is tends to slow the bath, and is a preventive of double es; finally, pay more attention to the temperature of baths—not a rinsing or preliminary wash of prints in ter probably registering 55° F., followed by a toning h which may be (aided by the warm hand) anything up to 7° F. This, followed by a fresh hypo bath at 45°, is not culated to produce the most pleasing results. The alum h also, if freshly made, will be below the normal tempera-e. In short, baths of low and fairly equal temperatures, ng ice to obtain these results if necessary, are very de-able at all times and seasons, but particularly during the og days." The remembrance of these little points will ble many a young worker to considerably improve the lity of his prints.

PHOTOGRAPHS ON JEWELLERY.

one period portraits in brooches, lockets, &c., were very ch the fashion, but that was a long time ago; indeed, it es back to the days of the Daguerreotype. The fashion, wever, remained for a long time—well into the sixties—d a very good business was done in coloured portraits—niatures—for jewellery, and high prices were charged for se of the better class. Afterwards the fashion—like all hions—underwent a change, and this kind of picture d out. There is just now an indication of its revival, d several inquiries have reached us within the past few eks as to the best method of producing photographs on tch cases, articles of jewellery, and the like. These eries, however, do not relate to portraits in brooches d lockets, but to pictures on such things as watch cases, tal match boxes, cigar cases, and similar articles. It is y obvious that the photograph, in practice, cannot be oduced direct on the object, and it follows, therefore, that must be transferred to it from a support upon which it has previously been made. It is equally manifest that when it is transferred to the metal it must be attached to it in some permanent way, and that it must also be protected in such a manner that it does not suffer mechanical injury with ordinary everyday usage.

We have a choice of several processes by which such pictures may be produced. There is the carbon process, for example. With this the picture can be developed on a temporary support, say, the ordinary commercial flexible support, when it can afterwards be transferred to a metal or other surface that has previously received a coating of gelatine containing a little chrome alum, and afterwards varnished. The film of a transparency by the wet collodion process, or that of a gelatine one, may be stripped from the glass by the hydrofluoric acid method, and then floated on to the article, prepared with some adhesive, such as gelatine, and be afterwards varnished to afford it protection against abrasion. Paper prints may also be utilised for the purpose, as in the so-called "crystoleum pictures"—namely, the print cemented on to the metal, and then the paper rubbed away with glass-paper or other abrasive material.

A correspondent has been good enough to send us a method he has in use, and with his permission we give the full working details of it; and it will be seen that it is extremely simple in practice. First prepare the following:

No. 1.

Plain collodion, of a tough character ...	1 ounce.
Venice turpentine	20 drops.
Castor oil	10 drops.
Spirit of camphor	2 drops.

The above will require thinning with ether and alcohol—about a quarter of an ounce of each, according to the viscosity of the collodion.

No. 2.

Take the white of one egg, remove the germ, and put into a bottle with 2 ounces of water and 3 drops of liquor ammonia, and shake well for a few minutes.

No. 3.

A bottle of Zapon Enamel, "No. 103." This may be obtained from the Frederick Crane Chemical Company, 22, Newhall-street, Birmingham, at 1s. the bottle. The method of working is as under:—First, a vignetted print of the desired size is made on glossy collodio-chloride paper, toned, fixed, and washed in the ordinary way, and dried. It is then flowed over with No. 1 solution, and the surplus drained back into the bottle, just as in varnishing a negative. The object of this coating is to strengthen and thicken the film for a future operation. When quite set the face of the print is well coated with Higgins's or other similar mountant and laid, face downward, on a clean plate of glass, and well squeegeed in contact with it. It is then allowed to become thoroughly dry. To transfer the picture to a watch-case or other article, the proceeding is as follows:—Put some warm (not hot) water into a porcelain dish, and dip the glass plate, with the attached photograph, into it, and as soon as the paper has become slightly softened, remove and commence rubbing it carefully away from that portion of the subject that is required in the

finished result with the ball of the finger. The plate may require re-dipping in the water two or three times to soften the paper during the operation. The object of removing the paper only from that portion of the print that is to form the finished picture is that a margin of paper is left, which will be somewhat of a support to the delicate film of collodion.

After all traces of the paper have been rubbed away to just a little beyond what is required in the finished picture, immerse the plate in very hot water, when the film, together with the paper margin, will be quickly detached from the glass—the latter serving as a support, and keeping it intact. It is then allowed to dry. When dry, with a pair of scissors cut off the paper margin and trim the film to the shape and size of the watch-case, or other article, to which it is to be affixed. Next flow over the surface of the article with No. 2—the albumen solution—and, without delay, place the film picture in position upon it, and press in contact with a soft silk handkerchief, taking care that all creases in the collodion are removed as closely as possible. This done, and without further delay, flow over with No. 3—the Zapon Enamel—when it will be found that any slight creases that might have escaped the pressing down with the handkerchief will at once disappear. The picture is then, without touching, allowed to dry, which will take some hours—say all night. The picture is then finished, and should prove very durable, inasmuch as the varnish with which it is coated is, practically, a very hard lacquer. Although the method has taken some little time to describe, it is really a very simple one in practice. In the abstract it is simply a collodion film, cemented to the metal with albumen, and then coated with a very hard and durable varnish.

In the early days of the collodio-chloride process, when "potichomanie" was the rage amongst ladies' amusements, a paper was sold, with a soluble substratum of gelatine, which could be stripped off, by treatment with hot water, after the picture was cemented to the inside of the vase. Some little while ago a similar paper was on the market —"Novitas"—but we think its manufacture, like the one of old, has been discontinued. If such papers as these were available it would be advantageous in the method just described, inasmuch as it would save having to get the paper off by rubbing it away, and the picture would be left quite free from all traces of grain or scratches, which may possibly not be the case when the paper is removed by mechanical means, unless it is very carefully done.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Annual Meeting at Oxford.

The Photographic Convention of the United Kingdom, of which Sir William Herschel, Bart., is the President, and Mr. Thomas Bedding, F.R.P.S., the outgoing President, commenced its annual meeting at Oxford, on the 8th inst., in conjunction with L'Union Internationale de Photographie, and as stated last week the first general gathering of the members was at a reception given by the Mayor of Oxford, Mr. G. Claridge Druce, in the Town Hall. The weather throughout the succeeding week was of an ideal character for the various excursions which had been arranged, and altogether the Oxford meeting has been most successful, a result in great measure due to the excellent arrangements and untiring zeal of the local executive committee, of which Mr. G. W. Norton and Mr. Mardon Mowbray, were the secretaries, and of Mr. F. A. Bridge of London, the general honorary secretary and treasurer of the Convention. Through the influence of members of the Oxford Camera Club, special privileges were granted to the members of the Convention to photograph within most of the Colleges. In some instances this permission has never before been granted to any Society, and it was therefore all the more appreciated.

The only item on the programme for Tuesday, the 9th inst., was a river excursion to Abingdon and Dorchester, which proved most enjoyable, although the heat was somewhat trying. Messrs. Salter Bros.' new and commodious steamboat, "Reading," was chartered and this being found not large enough to accommodate the whole of the excursionists, the "Swan" was also secured. In the unavoidable absence of the President, his place was taken by the Vice-President, Mr. Bedding. A short halt was made at Iffley, where the fine Roman doorway in the Church and the delightful scene of the old Mill attracted attention. Abingdon was reached shortly after noon and cameras were quickly brought into operation round St. Nicolas Church, the Town Hall, St. Helen's Church, the remains of the Abbey, and the curious cloistered almshouses. Luncheon was served in the Corn Exchange, Mr. Bedding presiding over a company numbering about two hundred. Subsequently the trip was continued down the river past Clifton Hampden, with its picturesque Church set on a rock overlooking a charming stretch of the river; and Burcot, with its well-kept river-side gardens (formerly occupied by Jabez Balfour). At Day's Lock, the party landed and walked to Dorchester, where the historic Abbey occupied attention for an hour. The return journey was delightful in the cool of the evening. Tea was provided on board, and Oxford was reached about ten o'clock.

The annual general meeting of the Convention took place in the Assembly Room, Town Hall, on Wednesday the 10th inst., the President occupying the chair, and, in the name of the Oxford Camera Club, thanking the Convention for accepting the invitation to Oxford. The ballot for the Council resulted in the election of the forty members nominated by the retiring Council, and on the proposition of Mr. Snowden Ward, seconded by the Rev. T. Perkins, it was agreed to accept the invitation to Cambridge next year which came through Mr. Sanderson. It was decided to substitute October for August in Rule II. Mr. Thomas Bedding proposed a hearty vote of thanks to the members of the Oxford Camera Club, their hosts this year, for all that they had done. Nobody but a comparative old Conventioner, such as he was, could realise the enormous amount of detail work which necessarily devolved upon the body taking upon their shoulders the duty of the local organization of the Convention, and he was sure they would all thoroughly agree with him, that the members of the Oxford Camera Club, and in particular the executive of that admirable Society were entitled to their very hearty thanks. Mr. G. W. Norton briefly acknowledged the vote, and similar compliments were passed to the Mayor of Oxford on the proposition of Mr. Bothamley and to Mr. Bridge on the proposition of Mr. Snowden Ward. Messrs. Schumann and Sanger Shepherd were appointed auditors. At the Council meeting which followed, Sir Robert Ball was elected President for 1902.

In the afternoon the President invited the members to a garden party in the picturesque grounds of Worcester College. The weather was of an ideal character for the occasion, and although the sun shone with the fierceness of an Indian solstice, there was some compensation in the cool, velvety greensward and the refreshing shade of the umbrageous trees, while there were also ample opportunities for the use of the camera. The refreshments and the singing of a glee party were both excellent, and in the Provost's private gardens, which are seldom thrown open, there was an interesting selection of stereoscopic slides by the Ives' process, and the apparatus of Professor Wood, of the United States, for viewing one of his brightly coloured slides obtained by the diffraction method. The official group of the Convention was taken by Messrs. Hills and Saunders.

The annual dinner and smoking concert was held the same evening

the Clarendon Hotel Assembly Room, the chair and vice-chair ng occupied respectively by Sir William Herschel and Mr. Bedding. e company, which numbered about 170, included the Mayor of ford (Mr. G. Claridge Druce), members of the Oxford Camera ıb, French, Belgian, and German members of L'Union Inter- tionale de Photographie, and a number of ladies. After the toast the King, Queen, and the Royal Family had been duly honoured, r. Bothamley proposed the "Photographic Convention of the ıited Kingdom," and said he believed he was right in stating that at Convention had afforded the first formal opportunity for a re- ion between the photographers of the United Kingdom and their low workers on the Continent, to whom they owed so much. He ought if they had done nothing more than that they might claim at they had to a large extent justified their existence, and he ped, as time went on, they would have further opportunities of sociating themselves, not only with Continental societies interested photography, but also with photographic societies across the tlantic. Mr. Bridge, whose name was associated with the toast, plied, and said that, looking at the Convention any way they liked, was in a better condition than ever it was since it first started. his was due to a combination of circumstances. In the first place, was due to the immense amount of trouble taken on behalf of the onvention by their retiring President, Mr. Thomas Bedding, and in e next place, it was due to the place where they met. Not a little the success was due to the presence amongst them of their friends om the other side of the Channel, and there was not the slightest ubt that many of their members had made a special effort to come Oxford, if only to offer the hand of friendship to their Continenta l ends. He had the privilege of proposing the next toast, and tha t ought him to another reason for the success of the Oxford Con- ntion, which was the work done for it by the members of the xford Camera Club, to whom they owed their hearty thanks. He d to couple with the toast the name of Mr. G. W. Norton, the local on. Secretary. Mr. Norton, in reply, said it had been a very proud casion for the members of the Oxford Camera Club to show the auties of their native city, and as he had heard from many how uch they had enjoyed their visit: that alone was a sufficient reward them for any little work they had done in bringing them together. ey had had the foundations laid for them of many future happy etings of this kind, because, of course, the members of the Camera ub would always attend Conventions.

Mr. Bedding, in proposing the toast of 'L'Union Internationale de otographie,' said that for many years he had been the unworthy cipient of great honours at the hands of the Photographic Con- ntion, and that evening witnessed the very crowning of those nours, for he was to be the official mouthpiece at that delightful nction of welcoming the visitors from the Continent of Europe. rtunately for him it had been his happy destiny for a number of ars past to make himself familiar with the literature of the photo- aphic public on the Continent, and they could hardly imagine the eat delight he felt at that moment in welcoming the bearers of mes that were classical in the annals of Continental photography. e cherished the idea that photography would be one of the agencies universal peace, and he would ask them to imagine the time when e Convention would meet in Germany, Belgium, and France, and ight they not anticipate that their friends would be as glad to see em in their several countries as the members of the Convention ere to see them in the delightful city of Oxford? Hearty applause as followed by the singing of the Marseillaise and the German ational Anthem. Mons. E. Juhl, from Hamburg, who spoke in nglish, said his colleagues of L'Union had requested him to thank e Committee and Sir William Herschel, Mr. Bridge and Mr. Norton, r their kind and hearty welcome and for the generous hospitality hich had been extended to them in the beautiful and historic city of xford. Mons. Pector, from Paris, replied in French, and said they ould carry away with them the happiest recollections of their visit Oxford, and when those interested in photography came to them the Continent, they would always receive a hearty welcome. He ank to the constant success of their numerous and grand Association d to the health of the members of the Oxford Camera Club. Mons. uttemans, from Belgium, speaking in English, also responded, and said he and his friends would be glad to meet the members at the meeting of L'Union Internationale de Photographie to be held next year in Switzerland. The health of the President was proposed by Mr. Snowden Ward, who referred to the charming and delightful afternoon they had spent in the gardens at Worcester College, at the invitation of Sir William Herschel. The toast was enthusiastically drunk, and briefly acknowledged by the President. Mr. Baker proposed "The Photographic Press," for which Mr. Bedding, the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, replied. The concluding toast of "The Ladies" was introduced by Mr. Claude Rippon, and acknowledged by Mrs. Snowden Ward. At intervals the Magdalen Glee Singers greatly enhanced the pleasure of the evening by their excellent singing.

On Thursday the Convention made an excursion to Warwick and were entertained to lunch in a most liberal style by the Warwick Dry Plate Company, who also supplied dry plates of all sizes free for refills, and had arranged a well-appointed dark room for the use of those requiring to change plates. Warwick proved very rich in photographic tit-bits, and a large number of plates were exposed. The dark room was commodious, and had double doors. Sir Montague Nelson presided at the lunch, which took place in the Guildhall and was attended by about two hundred persons. The toast list was a short one, consisting of "The King," "The Visitors," and "The Warwick Dry Plate Company." The most cordial expressions of welcome and thanks were made use of by the speakers, and the Continental visitors were not forgotten. M. Juhl replied in German, which was most happily translated by Sir William Herschel. In the afternoon brakes were chartered for Guy's Cliff and Kenilworth, and were largely patronised. Other members went to Leamington, but many found Warwick, with its historic castle, too charming to leave. The Conventioners returned to Oxford at half-past seven, after a most successful and pleasant day.

In the evening Mr. H. H. Turner, F.R.S., Savilian Professor of Astronomy in the University of Oxford, gave an address at the Town Hall, on "Photography in relation to Astronomy."

Professor Turner said the applications of photography to astronomy were so numerous and important that it would be hopeless to deal with them all in a single lecture, but he proposed to take one point in which astronomers differed from photographers, in that when they had taken a plate they sat down to measure it. The result of such measures was to obtain the places, distances, and sizes of the heavenly bodies. The same, however, might be done with landscape photographs, and the lecturer proceeded to show by a diagram how, if two photographs were taken at one hundred feet apart, and the positions of the objects measured on the plates, their real positions on the ground could be determined with nothing more than a little arithmetic. Two photographs taken close to the Observatory were shown, and from them were deduced the positions of New College, St. Mary's Church, and the Radcliffe Camera. Precisely in this way astronomers determined the positions and the distances of the planets. For instance, the little Eros, which had received so much attention from astronomers during the past winter, had been photographed just in this way and for this purpose. The camera was shifted rather more than a hundred feet—in fact, some thousands of miles—and to carry it so far the rotation of the earth was employed. But it was a simple matter to take one photograph, wait a few hours, during which the earth carried the camera some thousands of miles, and then take another. From the measures on the two, the distance of the planet could be deduced. The little planet might seem too insignificant to be the cause of all this trouble, for not only had two photographs been taken, but many hundreds by astronomers in all parts of the world, but it was really the representative in this instance of the whole solar system. In finding the distance of Eros they were finding the distance of the sun and of the other planets. The lecturer next emphasised the fact that he had made no mention of angles. The rules for finding distance and position had been accepted in a form which took no notice of angles. This was an advance suggested by photography, and had led to a simplification of many processes and formulæ in astronomy, as was illustrated by one or two slides. Passing on to other advantages of photography in astronomy, the lecturer remarked upon the ease

and rapidity with which a photograph was obtained. To make a drawing might take months or years, while a photograph could be obtained in a few seconds or less. Sometimes the opportunity was too short to allow of a drawing being made, as in the case of a total eclipse of the sun which only lasted a few minutes. On the screen was shown probably the best drawing ever made under such conditions, namely that by Mr. Wesley at the eclipse of last year in Algiers, when the French had shown such international courtesy in lending their magnificent telescope at Algiers to an Englishman because he happened to be familiar with the corona. But it could not be expected that drawings would often come up to this standard. As a rule they were vastly inferior to photographs in faithfulness, which was the second point noticed to the advantage of photography. Thirdly, the photograph was a permanent record and much more convenient than numbers. To record the position of a star, a photograph required only a single dot, whereas ten or twelve figures might be required to express the same position in numbers.

Again, the photograph had an advantage over the eye in its cumulative action, whereby very faint objects could be photographed by long exposures, so faint that no eye had seen them even with the largest telescope. Another point was the importance of the automatic action of the plate. Discoveries could be made by simply exposing a plate and leaving stray planets to record themselves upon it without any attention, or the minimum of attention, on the part of the observer.

The lecture, which was listened to with the greatest attention and interest, was illustrated throughout by a variety of slides and diagrams. At the close, Sir William Herschel proposed a hearty vote of thanks to Professor Turner. The lecture was followed by an interesting exhibition of lantern slides by members of the Oxford Camera Club.

On Friday the Convention had an excursion to Banbury, Broughton Castle, and Compton Wynyates. At Banbury the party which numbered about 120, were met by Mr. S. H. Beale, the Hon. Secretary of the Banbury and District Photographic Society, and Mr. W. Potts. Many of the members photographed the Cross, which, however, is quite a modern erection. The majority preferred the Reindeer Inn, dating from 1570. A very fine oak-panelled room, entered from the inn yard, has been declared to be the finest specimen of a Jacobean room to be found. The party then drove to Broughton Castle, the family house of Lord Saye and Sele, but now in the occupation of Lord Algernon Gordon Lennox, who was at home, and explained many of the interesting features of the interior. At noon, a start was made for Compton Wynyates, the seat of the Marquis of Northampton, dating from the time of Henry VIII., a very picturesque building of red brick. A Protestant Chapel on the ground floor, now used as a lumber room, has an interesting oak screen. Here many photographs were taken, and a picnic lunch was eaten in the grounds. At four o'clock, the brakes left for Banbury, and the return train reached Oxford about a quarter-past seven.

In the Assembly Room at half-past eight, Dr. Moritz von Rohr read the following paper.

Sir William Herschel, in introducing Dr. von Rohr, said he was sure they would all welcome him heartily into the office of lecturer for that night, both on account of the exceedingly interesting subject—one on which all their success depended—and also on account of his eminence abroad, and his kindness in coming across the ocean to meet them and give them the fruits of his wisdom:—

ON PERSPECTIVE AND DEPTH OF FIELD, WITH SPECIAL REFERENCE TO SHORT-FOCUS LENSES.

On receiving the kind invitation of the Convention's Council to read a paper on an optical subject, I endeavoured to choose a theme of general interest. Considering the great popularity of small cameras provided with objectives of short focal length, it seemed a point of some importance to inquire somewhat closer into their way of rendering the objects; so much the more as it is only a short time ago since we had some correspondence in one of the leading photographic papers about the question of depth of field.

I choose to treat perspective and depth of definition because these two qualities are closely connected with the general problem of photographic delineation; to represent solid (three-dimensional) objects on a plane (two-dimensional) surface. Every one of us will have read in some catalogue or other that the optician cannot correct his objectives for depth of focus, and that he cannot be held responsible for exaggerated perspective, if his customer uses a short-focus lens for taking a portrait on a comparatively great scale; when I take up this subject to-day, I wish to show that perspective and depth of definition are settled before the rays even enter the lens.

We will proceed according to Professor Abbe's theory, as far as it deals with the function of diaphragms, and I will begin by treating photographic perspective.

Let us first take the simple case of a pin-hole camera, and suppose that we obtain pictures with it, wherever we place the ground glass (fig. 1). If we now consider the representation of these two posts, P_1

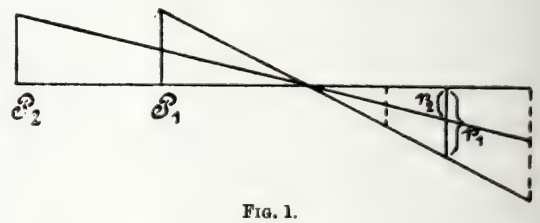


Fig. 1.

and P_2, on the ground glass, we notice that their images p_1 and p_2 bear a certain relation to each other, say $p_2 : p_1 = 5 : 10$. By altering the position of the focussing screen the image may be enlarged or diminished in size; but the relation of the two images (say $2p_2 = p_1$) remains obviously the same. In order to alter this relation, we have to alter the distance of the pin-hole. From the drawings, you may

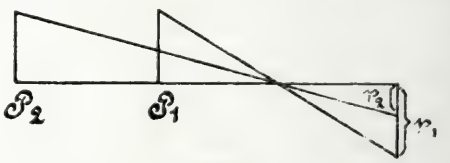


Fig. 2.

easily infer that this relation decreases $p_2 : p_1 = 4 : 10$ for a shorter (as in fig. 2), and increases $p_2 : p_1 = 6 : 10$ for a greater distance of the stop from the object (as in fig. 3).



Fig. 3.

Proceeding now to the more complicated case of a photographic objective, we will first assume that it is stopped down rather much, say to *f*-40 or *f*-50 (fig. 4), so that a great range of objects will appear sufficiently sharp on the ground glass in F if we focus for P_1. The



Fig. 4.

post P_2 will also be defined sufficiently sharp, and the whole image will at the same time appear much brighter than in the former case of the pin-hole camera. But one important difference is to be observed against our former case: we are restricted to a certain definite distance, say O F, in other words, we have *one* definite scale of reduction only of the objects in focus, and that is given by the well-known formulæ connecting the position of the image with the position of the object and the focal length of the lens. To find out the law according to which the lengths of the different objects *not* in focus are reduced on the matted surface, or, in other words, to find out

the perspective for the delineation on the ground glass, we look for the *object* conjugate to this drawing appearing on the focussing screen. Although the objects are represented thereon, they are obviously not themselves conjugate to it, because their sharp images cannot possibly lie in one and the same plane conjugate to the ground glass, and as the delineation here is formed by the intersection of certain rays *after* their passage through the objective, we must look for their intersection with the conjugate object plane *before* they enter the lens.

We will now first consider the way of the rays in front of the lens (the conjugate rays), and then find out the conjugate object plane. As our objective was stopped down considerably, we may exhibit the whole pencil emitted from any object point by one representative ray, passing through the middle of the diaphragm. In order to obtain a clearer idea of the course of said ray, we detach for a moment the front lens of our objective together with the small diaphragm (fig. 5).

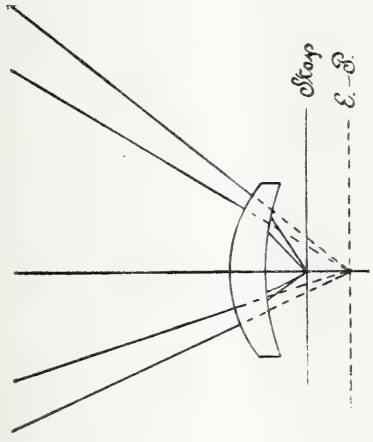


Fig. 5.

Supposing a bright object (polished pin's head) in the place of the diaphragm, the rays passing from it through the lens undergo the collective action of the lens as shown, and an eye placed in front of the lens will perceive the virtual image (of the pin's head) or of the diaphragm at a certain distance behind the lens. Rays travelling in the direction shown, before the objective, and these only, meet after refraction exactly in the diaphragm. According to Professor Abbe's appellation, we will call this image the *Entrance Pupil.*

Returning now to our objective, we may assert that every point on the side of the objects visible from the place of the lens, within the limits of the embraced angle, will determine a ray pointing to the entrance pupil, and passing through the objective; for the whole object side the entrance pupil evidently serves as the centre of perspective. Directing now our attention to the conjugate plane, we remember, looking at fig. 4, our supposition of the objective being focussed for P_1. For lenses free from astigmatism and showing a flat field as modern lenses do, the whole plane drawn through post P_1, perpendicularly to the axis is conjugate to the ground glass, and any point on this plane will appear sharp on the ground glass.

Having now ascertained the conjugate rays as the entire variety of rays aiming at the centre of the entrance pupil, and the conjugate plane as the "*plane focussed for*" (pl. f.f.) we have only to find the intersection of these rays with the said plane; in other words, if, after determining the pl. f.f., we project it on every object point from the centre of the entrance pupil we obtain the real object, the image of which appears in *n*-fold reduction on the ground glass. Now we clearly see the whole part the objective plays as regards perspective, given the object and the centre of the entrance pupil and determined the pl. f.f. (it generally passes through the chief parts of the objects and is therefore in Mr. T. R. Dallmeyer's treatise* designated as *the chief object plane*); the whole perspective is also determined, so that the only thing left to the objective is the linear scale of reduction.

In viewing any perspective delineation one has to be careful how to select the correct distance between the eye and the picture. We obtain this distance by applying the same reduction to the distance between entrance pupil and pl. f.f. as exists between the delineation on the pl. f.f. and the image. (If we photograph a bust from a distance of 12 feet at a quarter natural size, the correct viewing distance from the photograph is 3 feet.) If the correct distance be always observed (fig. 6), we get the same impression when viewing

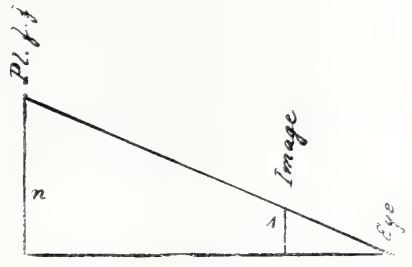


Fig. 6.

the photograph as the objects depicted on it represented themselves to the eye at the place of the entrance pupil of the objective, and this is unquestionably the correct impression.*

In accordance with this rule it is advisable, by looking at the object itself, first to determine the centre of perspective; one will then invariably obtain a pleasant impression when inspecting the photograph from the right distance. But if, on the contrary, the size of the objects in the image is our principal aim, it will, in the case of short-focus lenses, become necessary to reduce the distance between object and lens, thereby altering the perspective. In extreme cases, i.e., in *mis*-using short-focus lenses, we may be compelled to advance too close to the object, and to take a photograph from a standpoint totally unusual for ordinary contemplation; in such a case the picture, notwithstanding its perfect correctness, will appear unpleasant, even if it be viewed from the proper distance. Summing up, we may say perspective is a function merely of the distance between pl. f.f. and the entrance pupil; the objective has nothing to do with it; the only part it plays consists in reproducing the delineation of the pl. f.f. in a certain reduction. If the photograph be viewed from the correct distance, it must necessarily convey the right impression. The only thing to be observed from a pictorial point of view is with regard to the selection of the standpoint; to avoid an unpleasant impression, the distance between pl. f.f. and entrance pupil must not be smaller than the ordinary viewing distance of the objects photographed.

The foregoing considerations on perspective remain correct also in the case of objectives with large apertures. Every photographer will be aware that the different points on the focussing screen of a stopped-down objective representing object points in front of or behind the pl. f.f. do not alter their position if the iris is opened, but only appear more and more indistinct. Therefore, everything belonging to the perspective of a photograph remains unaltered.

The reason for this blurring is not difficult to give. It is founded on the fact that objects at different distances in front of the lens are rendered sharp at different distances behind it (fig. 7). So the cone of rays emitted behind the pl. f.f. is brought to a union in front of the ground glass, and on this plane shows a spot or circle of confusion instead of a point, and likewise for a cone of rays emanating from a point in front of the pl. f.f. From this drawing the reason becomes evident why in a modern rapid objective the image on the ground glass is composed of sharp points for objects lying in the pl. f.f. and of smaller or larger spots belonging to points at shorter or longer distances from the pl. f.f. As in the former case when discussing perspective, it will here also simplify matters to find out the object conjugate to the delineation on the ground glass. Being aware of the connexion between focussing screen and pl. f.f., we have

* "Tele-photography," p. 95. London: Heinemann 1899.

* There may, however, arise a difficulty from the fact that the proper viewing distance lies within the least distance of distinct vision, being less than 10 inches. In this case, the picture must be inspected by means of a magnifier, or we have to substitute a copy so enlarged that the proper viewing distance comes up to 10 inches.

only to look for the intersections between pl. f.f. and the cone of rays in front of the lens. From a similar consideration as in the former

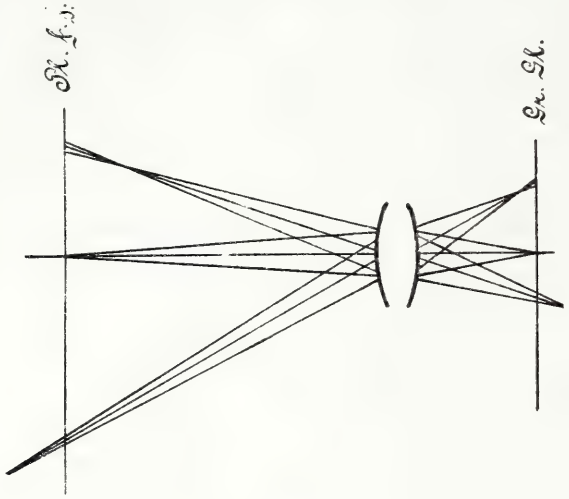


Fig. 7.

case of the small stop it is equally evident (fig. 8) for a large stop that only such pencils pass the diaphragm after collection through the front lens which are directed originally towards the entrance pupil.

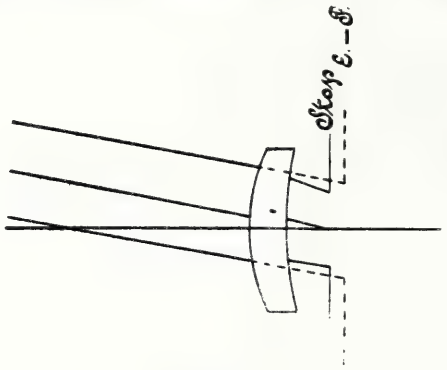


Fig. 8.

The common basis of all the pencils coming from the object side and passing through the lens is, therefore, the entrance pupil. Consequently we obtain at once the conjugate object looked for, by projecting every object point within the angle of the objective on the pl. f.f. by means of a cone having its apex in the point and its basis in the entrance pupil. By this method, founded on Professor Abbe's theory of the entrance pupil, we get rid of the action of the objective altogether so far as depth of definition is concerned; in other words, we consider the depth of definition question in the case of an ideal lens giving a perfect reduced image of the delineation constructed on the pl. f.f. The indistinctness present in this case has nothing whatever to do with the state of correction of the objective, the type of construction, &c. It is the consequence of the fact that an object of three dimensions is to be projected on *one* plane by means of pencils of definite aperture. The whole problem is definitely fixed when pl. f.f., distance, and diameter of the entrance pupil are given.

The above-mentioned indistinctness presenting itself very remarkably, the interest of photographers was intently fixed on it, and in the very first photographic time the idea was maintained that different objectives possessed this fault, as it was called, in a different degree, and principally the difference observed in long and short-focus lenses awakened interest. The question put in such a case is—as far as I am aware—generally the following: given for a system with given aperture a certain object distance or scale of reduction, which is the depth of definition (sometimes also called depth of field or inadvertently depth of focus), if a circle of indistinctness of 0·01 in. is allowed? In this question—it is true—everything is distinctly stated, but we are far from treating photographs taken with systems of different focal lengths alike. An example will clearly show it: supposing two photographs representing the same object taken with two lenses of different focal length from the same standpoint and under the same standard of indistinctness (0·01 in.), then nearly always the depth of definition in the smaller photograph is greater. Now, it may be necessary to project these photographs (or congruent diapositives) on the screen, and in order to obtain the same convenient size of objects in both cases, the larger may have to be magnified 20, the smaller 40 times. We immediately see that by giving different linear magnifications to these two diapositives, the depth of definition will diminish for the smaller because the same circle of indistinctness is magnified twice as much in one case as in the other. It is not difficult to give the reason for it in our way of contemplating the subject. We are aware of the fact that we obtain every dimension in the pl. f.f. by multiplying the conjugate image dimension by the scale of reduction. This naturally applies to the circle of indistinctness as well; consequently admitting the same circle of indistinctness of 0·01 in. to a photo reduced 200 times, as to a picture reduced 400 times, we admit in the first instance on the pl. f.f. spots of 2 inches diameter, and of 4 inches in the second case. Although the photographs taken from the same standpoint show exactly the same perspective, quite different standards are applied to distinctness in pl. f.f.

I think we could find a way out of this difficulty by going back to the meaning of distinctness of vision. In consequence of the construction of our eyes, we are not able to distinguish a perfectly sharp point from a spot appearing under a certain small angle generally taken as 1'.* The diameter of the spot passing as a point is therefore dependent upon its distance, and may be considered, according to the old theory $\frac{1}{3438}$ of this distance, or one inch for every 286·5 feet. If we allow on the pl. f.f. such circles of confusion only which subtend no greater angle than 1', the delineation on the pl. f.f. will appear perfectly sharp to an eye at the plane of the entrance pupil. In the same manner we may call the conjugate photograph perfectly sharp if we view it from the correct distance, for obviously in this case (see fig. 6) the angular measure (1') remains unaltered because object and viewing distance undergo the same reduction. One sees immediately that for photographs taken with short-focus lenses the diameter of the circle of confusion in the image becomes smaller than with long-focus objectives, because the viewing distance decreases in the same ratio as the reduction increases. Such pictures, however, can be subsequently magnified to the size of images taken with larger lenses from the same standpoint, and they will then prove equal, taking exception of the deterioration connected with the process of magnification. I may mention here that it is obviously unnecessary to fix the angular standard of distinctness at 1'; every multiple will do as well if for scientific or artistic purposes a higher or lower standard seems desirable. The ordinary standard of 0·01 inch in the photograph corresponds—the distance of distinct vision being taken as ten inches—to 3' 26" or the 3·4-fold amount of the former. But whatever standard we may use, it seems advisable to employ the angular and not the linear measure.

We are now in the position to answer the following question: Supposing angular indistinctness and perspective remaining constant, is there any advantage as regards greater rapidity together with the same depth of field in using short-focus lenses with the object of subsequent enlargement of the image? According to our way of treating this question there are given the pl. f.f., and together with the distance of the entrance pupil, the diameter of the circle of confusion in the pl. f.f. For any size of the entrance pupil we may very easily determine the depth of definition (fig. 9). Let the circle of confusion in the pl. f.f. be represented by C C, then it is only necessary to draw straight lines from both points representing the entrance pupil to each point C. By this means two points, D D_1, are defined and, as one immediately sees, D D_1 is the required depth of definition consistent with the given distance between pl. f.f. and entrance pupil, the size of the latter, and the given angular value of indistinctness. Any objective at the place of the entrance pupil, and with an entrance pupil of the same size, has exactly this same

* According to the old theory this angle was taken as 1' for normal eyes; from more recent investigations we know that now and again people are found able to distinguish much finer detail; even $\frac{1}{3}$ of the normal standard (10") sometimes occurs.



MEMBERS OF THE SIXTEENTH ANNUAL

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HI CONVENTION OF THE UNITED KINGDOM.

8[13th, 1901.

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lepth of definition, D D_1. Now, as the intensity increases with the quare of the diminution of the focal length, the size of the opening emaining constant, the advantage of short-focus lenses is apparent.

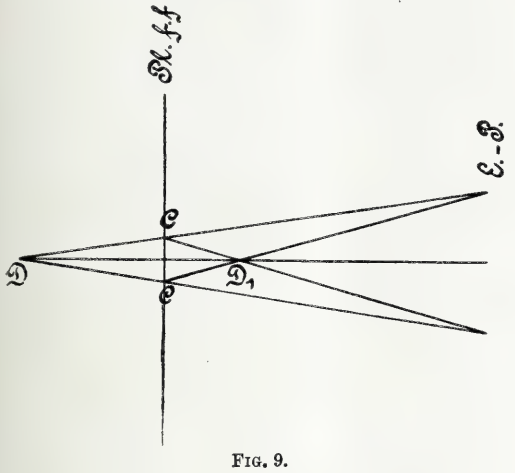


Fig. 9.

Assuming two objectives, one of half the focal length of the other, he shorter one will give in a quarter of the time a picture which, y subsequent enlargement, may be made congruent to that of the onger.

The other question of interest presenting itself is the following: How great is the advantage of the short-focus lens as regards depth f field, perspective and relative aperture being constant? This annot be answered in so general a manner as the preceding question; he advantage somewhat varies according to the general formula for he depth t depending upon the distance d (between pl. f.f. and ntrance pupil), the size of the entrance pupil a, and the indistinctness i in the pl. f.f.

$$t=\frac{2d\,ni\,a}{a^2-n^2i^2}\ ^*$$

To illustrate this formula to those not versed in such calculations I hoose a certain fixed distance of 2 m (6 ft. 6·7 in.), and gave for wo objectives of 140 mm. (5½ in.) and 210 mm. (8¼ in.) focal ngth, the connexion between depth of definition on one side and ze of entrance pupil and distinctness on the other side by means of iagrams (figs. 10, 11). I connected all the points where the depth of efinition was equal to certain fixed lengths from 1 to 12 inches. he axes of the diagram are divided twofold: the horizontal cording to the numbers of millimetres giving the size of the ntrance pupil, and underneath this size as part of the equivalent cal length, the vertical axis according to the indistinctness in the nage i and according to the indistinctness ni in the pl. f.f. (We now for a fair comparison this latter value must be taken.) Metric easurements are employed in consequence of their decimal subivision; in the lines of equal depth of definition, however, inches vith the approximate value of 25 mm. instead of 25·4 mm. to an ich) could be ascribed. Looking at the diagrams one immediately otices that the curves of equal depth of definition become straight nes emanating from the origin. This has the consequence of a ery convenient construction of these lines, and furthermore the onnexion of a constant depth of definition with indistinctness and iameter of the entrance pupil becomes evident. I may at the same me point out that only by introducing the linear measure of the ntrance pupil, the diagram becomes so simple, whereas by dividing the horizontal axis according to relative apertures (f-10, f-15, f-20, &c.), in equal intervals we should obtain a kind of hyperbolic curve. The reason for this lies in the fact pointed out before, that the whole projection by means of which the delineation on the pl. f.f. was obtained is quite independent of the focal length of the lens. With regard to perspective and depth of definition, the photographic objective plays only a part of secondary importance in reproducing an ideal but nevertheless perfectly determined plane object on a certain scale of reduction.

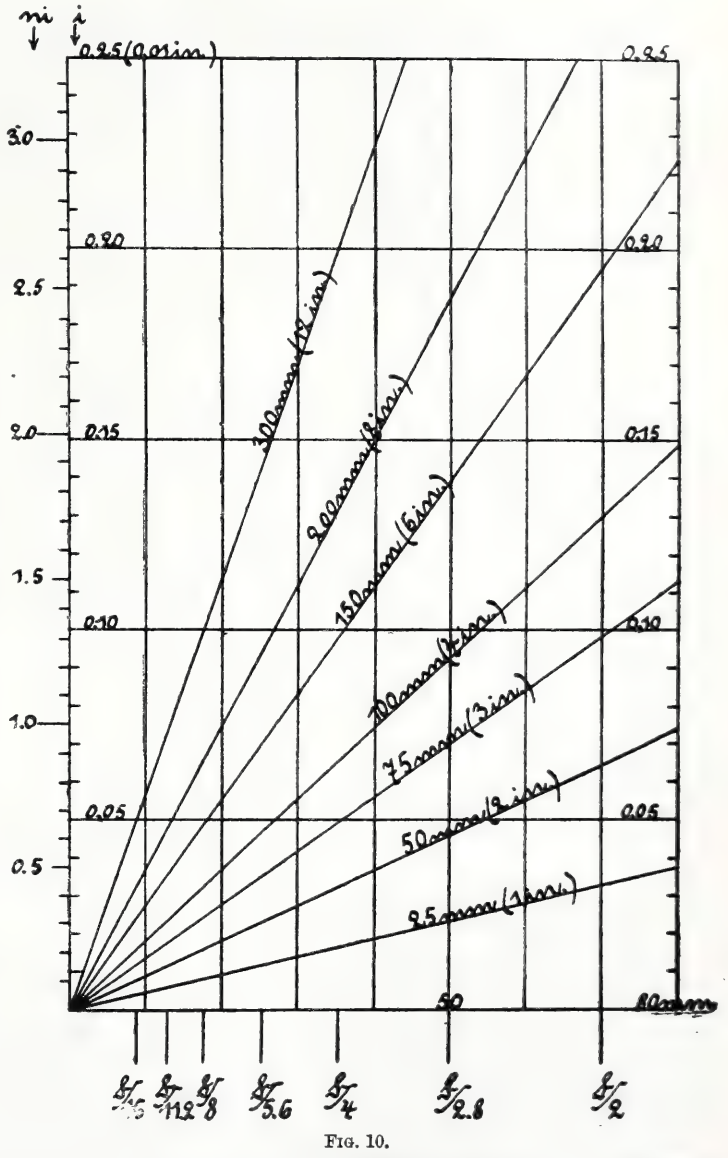


Fig. 10.

Lines of equal depth of definition for an objective of f=140 mm. 5½ n.), focussed for a plane at a distance of 2 m. (6 feet 6·7 in.).

It will not be difficult to gather from these diagrams a corroboration of our previous statement. Assuming, for instance, ni=0·85 mm., we have for f=210 mm. (8¼ in.), a depth of definition of 2 in. for a=68 mm. or f-3·09; whereas for f-140 mm. (5½ in.), we obtain ni=0·85 and depth of definition=2 in. for the same a=68 mm. or f-2·06. If we now stop down the smaller lens to f-3·09 or a=45·3 mm., the depth of definition for ni=0·85 mm. becomes 3 in. or it varies inversely as the focal length. This is always the case so long as the diameter a is great in comparison with ni; if a and ni are quantities of the same order, the depth of definition of the smaller objective increases much faster than in the inverse ratio, but in this case one must go back to the formula.

From the preceding paper we are entitled to the following conclusions: small lenses show no disadvantage compared with large ones, as far as perspective is concerned, if the photograph is taken from a sufficient distance and a suitable magnifier (or magnification) is provided to look at the picture from the real centre of perspective.

* For anybody interested in inquiries of this kind, I may remark that by viding numerator and denominator by a^2 and defining the auxiliary angle by

$$\tan\frac{w}{2}=\frac{ni}{a}$$

e formula becomes,

$$\frac{t}{d}=\frac{2\tan\frac{w}{2}}{1-\tan^2\frac{w}{2}}=\tan w$$

these formulæ anybody accustomed to tables of logarithms will be able to d very soon any of the four quantities t, d, ni, a, if the other three are ven. Generally a table with four decimals will amply suffice for our aim.

With regard to depth of definition—the distance from the pl. f.f. remaining unaltered—small lenses possess decided advantages even though we claim constant *angular* indistinctness. If the same depth

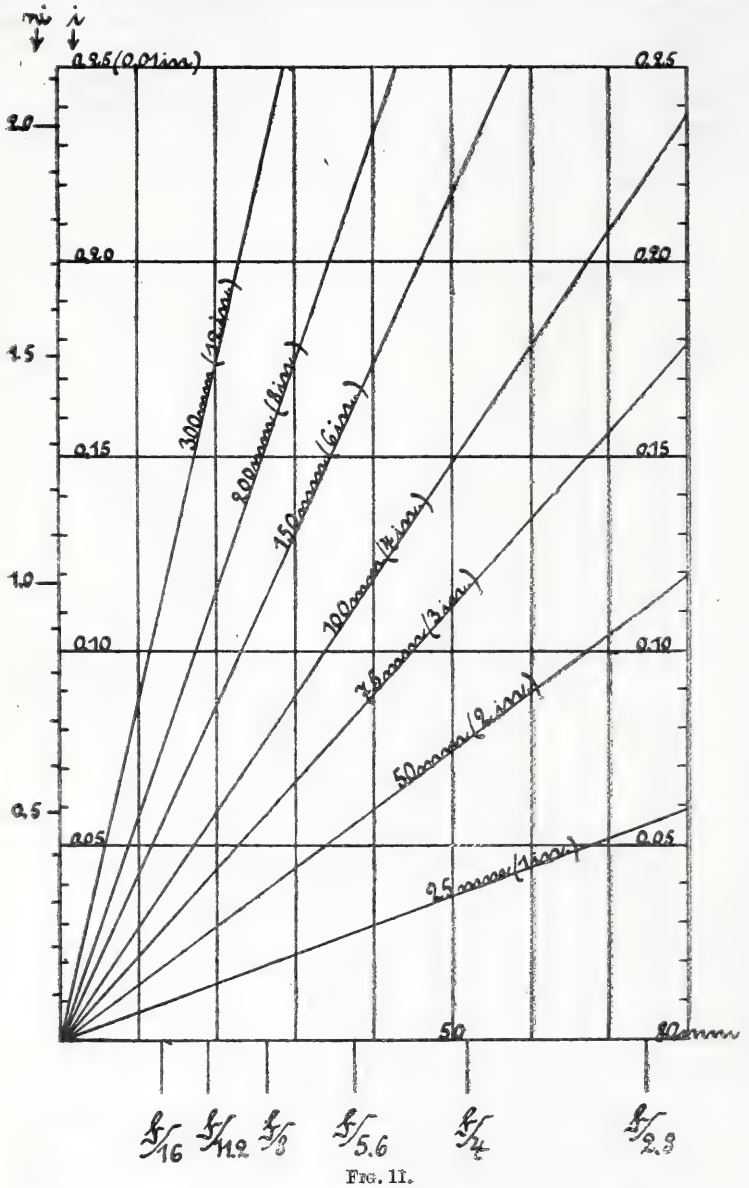


FIG. 11.

Lines of equal depth of definition for an objective of f=210 m.m. (8¼ in.), focussed for a plane at a distance of 2 m. (6 feet 6·7 in.).

of definition is our object the time of exposure shortens as the square of the focal length, and if the relative aperture of the lens remains unaltered, the depth of definition extends at least in the same ratio as the focal length decreases. DR. M. VON ROHR.

Sir William Herschel proposed a cordial vote of thanks to Dr. von Rohr, and said he should have liked to hear him in the rooms of the Royal Photographic Society, speaking to persons more able to enter into the thorough detail which he had given them than perhaps most of them there, because, after all, they were amateurs almost all of them, and did not profess to be mathematicians of the art. He understood Dr. von Rohr to say that to see a photographic picture properly one must have at one's disposal certain data as to the nature of the camera, the focal length and all that with which it was taken. Would it be possible, if photographers mastered his instructions, to place on any picture which they thought it worth while to take such care of, a note of the proper distance at which that picture ought to be viewed in order to get the true perspective?

Dr. von Rohr replied in the affirmative, and said there was no doubt that every picture taken in a camera could be viewed, and must be viewed, at one particular distance from the plane of the picture. Viewed from any other distance the picture would appear more or less distorted, and a great many of the cases in which the fault of distortion was found would lose their foundation if the picture was looked at from the right standpoint and with one eye. They could not look properly with two eyes at a picture which was taken with one lens alone.

"Seeing not Believing" was the title of a lecture delivered by Mr G. Watmough Webster, which proved very interesting. In the course of his remarks Mr. Webster said that the eye was the sense organ whose integrity was valued before any or all the others. It was exercised the most, and yet under a large range of conditions it is the one whose messages to the brain were least trustworthy. When the eye spoke to the brain the very simplest matters of every day life were liable to be wrongly translated—the aspect of the heavens by day, and the heavenly bodies by night, of the buildings and the streets around us, the countenances of our friends, the garments we wear—all were very different from what we imagined them to be either in size or in proportion. The illustrations which would follow were devised and collected to prove the difficulty—it might almost be said the impossibility—of forming correct impressions of the several relations of objects—colour, size, proportion, position, and even their actual form. It might be pointed out that there was what might be termed an ophthalmological aspect of the subject in an abnormality present in greater or less degree in the eyes of most persons, and known to surgeons as astigmatism. It cause was a deviation from absolute symmetry in either the surface of the eye or its lens, and its effect was to cause a point to be seen as a line in one direction, not always the same for each eye. Two or three diagrams were thrown on the screen to illustrate this point. Parallel lines in one direction appeared to the astigmatic to merge into one another and ceased to be sharp and clear. Upon turning the diagram upside down the fogginess was transferred to one of the other groups of parallel lines. Opticians remedied the defect by what were termed cylindrical glasses in the spectacles they supplied. Examples were then given to show how the senses might be deceived as in the case of the crossed fingers placed on a marble which appeared to be two, or on the nose, which seemed to have a double tip. This was an excellent example of erroneous judgment when experience was at fault. The next diagrams showed how the eyes alone were deceived. These were a series of the letter S and the figure 8, which, when shown in the ordinary way presented nothing remarkable, but when turned upside down the disproportion between the top and bottom lobes was so great as to become ludicrous. As a matter of fact, whenever we are familiar with any set of objects running in pairs, so to speak, our sense of proportion became blunted, and the greater the familiarity, the greater the warping of the judgment. This was one reason why so many people were dissatisfied with the counterfeit presentments of their friends as supplied by the photographer. We were accustomed to see in our friends' features life and animation, motion in fact, and when the immobile print was before our eyes we were in consequence able to see an extraordinary lack of symmetry in the lineaments, just as in the upside-down letter S. Still more droll did this crookedness of features become if we looked at our friend's face in a mirror. Then again we were outside our experience, with the effect of enabling our innate sense of proportion to have fair play. A large number of diagrams followed, to show how the eye was deceived as to the length and direction of lines, and the size of objects.

The lecturer also referred to a very singular phenomenon, the fact of the moon high up in the heavens. What was its apparent size? or in other words what objects held out at arm's length, and as it were placed side by side with the moon, would appear to the eye to equal it in size? The usual answer ranged from a cheese through a dinner plate, to a half-crown piece. But the true companion object was neither a dinner plate nor half-a-crown, nor even a threepenny piece; an average-sized pea placed on a pin, and held out as described, appeared quite as large as the moon.

The evening terminated with an exhibition of some colour photographs by Messrs. Lumière's process.

Saturday, the last day of the Convention, was devoted to various short excursions to places in and around Oxford. The morning was showery, but in the afternoon the weather cleared, and a delightful time was spent.

DEATH OF MR. W. J. STILLMAN.

The death of Mr. W. J. Stillman, which took place at his Surrey home on the 6th inst., at the age of seventy-four years, removes from our midst one, the story of whose adventurous career includes the history of some of the most stirring episodes in the annals of Southern and Eastern Europe during the past century.

Mr. Stillman was personally known to many in the photographic world, and from an early period was an enthusiastic photographer. Little of his work has been seen in recent times, but, until a few years ago, he was a frequent exhibitor at the Pall Mall Exhibition. The series of photographs of ruined temples and other antiquities of Athens, produced by him in 1869, was certainly the finest work of the kind that had been done up to that time, and it has hardly been surpassed even now. Mr. Stillman joined the Photographic Society of Great Britain in 1885, and remained a member until his death.

Mr. Stillman was American by birth, having been born in the State of New York in 1828. His early intention was to become a painter, and, with a view of studying art, he visited England in 1850. Here he devoted himself to the study of the great masters. Among the friends he made were Ruskin, Millais, and Rossetti, and his style was greatly influenced by their teaching and example, so much so that on his return to America his work was distinctly pre-Raphaelite in character.

In 1851 Kossuth's tour in America in the cause of Hungarian freedom inspired Stillman with enthusiasm, and he placed his services at the disposal of the revolutionary cause. An opportunity was soon found him for active employment, and he was sent on a mission to Hungary to recover the Hungarian Crown jewels, which had been buried during the insurrection of 1848–9. He was unable to accomplish his object, owing rather to want of efficient co-operation on the part of those whose business it was to act with him than to any deficiency on his own part, but, though disappointed, he was not disheartened, and agreed to take part in a rising that was then being arranged to take place in Milan. Until the time was ripe he retired to Paris to renew his art studies. The Milan rising was abandoned, and Mr. Stillman returned to the United States, and occupied himself with painting.

It was at this period that Mr. Stillman commenced his connexion with journalism. A paper was started by him, the title of which, "The Crayon," indicates its scope. It was not a financial success, but it was the means of bringing him into contact with Longfellow, Emerson, Lowell, Agassiz, and other notable literary men of his own country.

In 1861 Mr. Stillman was appointed United States Consul at Rome which was then under the Papal dominion, and, later, exchanged his consulship for that of Crete. Here, his sympathies with the oppressed found full scope for activity, but his endeavours to obtain justice for the down-trodden Cretans from the Turkish rulers naturally brought him into notice, and exposed him to insult and even open hostility. The strain of the life obliged him to resign his appointment, and, moving to Athens, while still continuing his endeavours on behalf of the Cretans, he produced the series of photographs we have referred to.

A few years were then spent in England, and in 1875 Mr. Stillman commenced his connexion with the *Times*. His first work for that paper was as a correspondent in the Herzegovinian insurrection, and the subsequent campaigns. When opportunity occurred, he made journeys in Albania and Montenegro, and our Foreign Office was undoubtedly often influenced by his reports in the *Times*. Subsequently he became *Times* special correspondent at Athens, and still later in 1886 at Rome. On his seventieth birthday he resigned his position, and retired to a quiet spot in the country.

Mr. Stillman will be remembered better as a journalist than as a photographer or a painter. His pursuits were so many that to excel in any one was difficult, nevertheless in all he made a reputation. In later years the photographic world has heard little of him; but when photography was more difficult than it is now, he was one of its most honoured exponents, and a frequent contributor to the JOURNAL and the ALMANAC.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION

The following additional members have joined the Association since last week:—

Christian, J. Hamilton, Photographer, Salisbury-buildings, Park-road, Peterborough.
Foster, Lewis Joseph, 21, Bodfor-street, Rhyl, N. Wales.
Macartney, James, Photographer, St. Meddans-street, Troon.
Neville, Tilsley, Aintree Studio, 71, Walton-vale, Aintree, Liverpool.
Nielsen, August, Artist and Photographer, Kilkenny, Ireland.
Osborne, Clara (Thomas Chambers, Osborne and Chambers), 38, High-street, Bilston, and 24, High-street, Bridgnorth.
Salmon, Herbert William, Park-road, Teddington, S.W.
Scamell, Edgar, 120, Crouch-hill, London, N.
Watt, Robert M. (junior partner, Watt & Son), 30, Reform-street, Dundee.
Wicks, John Leigh, Baddow-road, Chelmsford.

RECENT IMPROVEMENTS IN OZOTYPE.

[Reprinted from the "Journal" of the Camera Club.]

This is the second time I have had the honour of demonstrating this process before an audience who are supposed to know something about the latest movements in the photographic world. It would, perhaps, be superfluous to enter into minute details as to what ozotype is. I will describe it very briefly as a modification of the well-known carbon process, in which the image, instead of being produced upon a sensitised pigmented gelatine film, called carbon tissue, is printed on the paper which is to be the permanent support of the picture, and an insensitive pigmented gelatine film is laid down upon it. This variation in the procedure gives the picture in its correct position as to right and left, and no transfer is required. The image is distinctly visible during exposure, and requires only a short washing in cold water to fix it.

Any new process, especially one that is based upon the delicate chemical changes induced by the action of light, involves an immense amount of experiment, and is dependent upon so many factors that it may be considered presumptuous for one individual to carry them to an issue. This process is so novel that no book or person could give me any useful information, and everything had to be done by the exhaustive process of trial and error.

I have made some improvements after a period of observation and experience, and I flatter myself that at the present time any person with a fair knowledge of photography, and gifted with a determination to overcome initial difficulties, could turn out some very artistic work. Ozotype pictures are unlike those produced by the carbon process, and the new method cannot, therefore, be regarded as a rival of the old. They are less photographic in appearance, and present a broader effect, partaking somewhat of the character of paint laid upon paper. The beautiful examples of ozotype, by M. Robt. Demachy, lately on view at the Royal Photographic Society's rooms, will show what can be done by a worker with true artistic instincts, who knows perfectly well what effect he wants to get, and works it out with forethought and assiduity.

My own examples I have brought to show you this evening are all untouched, the different results being produced either by modification in the acetic acid bath, or by means of different qualities of paper. The first consideration in every photographic printing process, and, indeed, in all artistic work is the foundation or basis upon which you are going to produce your picture. Paper is the only material I have yet worked upon—glass and other supports will probably come later. Any good drawing paper may be used, the so-called lithographic art papers being unsuitable, as in nearly all cases the surface dressing decomposes the sensitising solution. The F and M (fine-glazed and matt-surface) papers supplied by the Ozotype Company give excellent results, and are easy for the beginner to work; but fine cartridge, Turkey mill, O. W. Michallet, or Whatman, hot-pressed, may be used if a particular character of paper is required to give a certain effect. Having selected our paper, we proceed to the consideration of sizing. In my little pamphlet, entitled "Lessons in Ozotype," I insist that all papers should be sized. I made this injunction in the interest of beginners, who might find, especially in winter time, that the pigment plaster did not properly adhere to the paper, leaving small white spots in pulling it off. However, as M. Demachy says in his lecture before the Photo Club de Paris, sizing is a matter of taste, the more sizing used the brighter will be the picture; but there is a limit, for too much sizing may cause the high

lights to wash away. Ten to fifteen minims of the sizing solution to each drachm of sensitising solution is sufficient for smooth paper; rough paper requires twenty to twenty-five minims. Where no sizing is used, and the paper is an English or French drawing paper, the effect is rather more like a gum bichromate picture, and would suit many subjects.

I will now show you the way to coat a sheet of royal size paper, with the sensitising and sizing solutions mixed, making one operation.

Pigmenting the Initial Image.

Having made the initial print, which will keep many months if placed in a portfolio out of contact with the air, the next step is to lay the colour on the image. This is performed by placing a piece of pigment plaster in contact with the image under the surface of a solution which will cause the substance, which has been produced by light, to act upon the gelatine film, so as to render it insoluble in proportion to the varying amount of light product. This solution is called the acetic bath, and consists of very small quantities of acetic acid, hydroquinone, and sulphate of copper. The action of this solution is difficult to explain, and requires further experiment before I can say positively the precise chemical actions that take place. Of course, there is a reduction product formed, which is probably $Cr_2O_3CrO_3$, and there is also the metallic chromate resulting from the loss of the acid character of the sensitising solution under the influence of light. This is Mr. A. Haddon's theory, and I am inclined to think it is the correct one. It would appear from this hypothesis that a reduced product and an oxidising substance are formed, and it may naturally be inferred that both an oxidising agent and a reducing agent are required to develop the maximum amount of soluble chromium compound. Experiment has proved this to be the case. A judicious mixture of acetic acid and hydroquinone has the strongest action. Three parts of acetic acid to one part of hydroquinone is a good proportion. If we prepare—

Hydroquinone	20 to 25 grains.
Glacial acetic acid	60 mins.
Water	40 ounces.

We might also call it a standard formula; but if this solution is used alone there might be a tendency for the details in the high lights to wash away during development. We must, therefore, find a substance which will, in the presence of a chromic compound, assist the insolubilisation of the gelatine. There are two metallic salts which will produce the desired effect, namely, ferrous sulphate and cupric sulphate. Ferrous sulphate, in the presence of a chromate, has a very powerful action on colloids, probably on account of its reducing property, added to the peculiar character of an iron salt. I find this salt not very reliable in its action; it did not agree very well with hydroquinone either in action or in solution. Another drawback was that it had to be weighed out in grains, which was inconvenient. I have, therefore, substituted sulphate of copper, and I find the acetic solution will now keep quite clear for a fortnight or a month. The copper solution is also very convenient to use, as it can be kept indefinitely as a 10 per cent. solution. The copper solution should be used with judgment. If a thin negative is printed from it, it would be an advantage to over-expose and use a minimum of copper, say, 20 to 40 minims of the 10 per cent. solution. On the contrary, if the negative possess strong contrasts, a fair amount of copper, say 100 to 150 minims, should be added to the acetic bath. For prints from ordinary negatives expose until the details in the high lights are visible, and add 60 to 70 minims of the copper solution. Some remark may also be made with regard to the effect produced by varying quantities of acetic acid, which seems to have the property of causing the action to penetrate into the film of gelatine, giving depth of colour in the shadows. If we were to make up a solution, say—

Water	40 ounces.
Glacial acetic acid	120 minims.
Hydroquinone	20 minims.

the action would penetrate so far into the body of the film that it would soon reach the paper backing of the plaster, and then probably spread itself out, producing a blurred picture. The same effect, however, without the blurring could be carried out by using a definite quantity of acetic acid and hydroquinone, and arresting the progress of the penetrating action by sulphate of copper in varying proportions to suit different characters of negatives. In prints from weak negatives, we want the action to penetrate into the film to produce depth in the shadows, and, therefore, we use less copper. In prints from negatives with strong contrasts, our object is to obtain detail in the high lights. We therefore use the detail-giving copper, and we modify the progress of the action into the body of the film. I have gone somewhat fully into the properties and nature of the acetic bath, as I am convinced that a proper understanding of its action is the key to success. When this is once mastered, then ozotype will be found the most plastic of all photographic printing methods, not even gum bichromate excepted. (The lecturer then proceeded with the practical part of the pigmenting operation.)

Thomas Manly.

Discussion.

Mr. C. H. Bothamley was sorry he could not say anything from the practical point of view. There were many points of considerable interest about ozotype, especially as regarded the acetic bath and the copper solution. It was fairly well known that acetic acid had the peculiar property of softening and even of dissolving gelatine, and promoting diffusion through the gelatine. The action of the copper was particularly interesting, though it was not quite analogous to the behaviour of copper solution in other processes. Copper salts acted as carriers of oxygen; perhaps, this was how they acted in the case of ozotype. There was also one or more processes for the manufacture of certain aniline dyes. Very small quantities of copper salts promoted the oxidation of particular substances. It was well known that if comparatively small quantities of copper salts were added, then a considerable shortening of the scale of gradation would result, the same effect as would be obtained from a stronger negative. He understood Mr. Manly to say that aluminium salts would have the same effect. Of course, alum would make the gelatine insoluble undoubtedly. What part did hydroquinone play in the preliminary bath?

Mr. Smith Williams asked, Was the process difficult on unsized paper? The glossy effect in the shadows was objectionable; he would prefer to be without it and to use rough paper.

The Rev. F. C. Lambert, M.A., had tried a good many experiments, and obtained curious results—failures, owing probably to keeping the paper in the acetic bath too long.

Mr. Bothamley said that whether the process was the ordinary carbon, ozotype, or gum, he thought it was very important to bear in mind the ordinary division of the image into a soluble part and an insoluble part. It was not a question of the action of light making certain parts insoluble and leaving other parts soluble, nor a question of solubility or insolubility, but differences of solubility. As Mr. Manly had remarked, if you kept the image in too long, it would disappear altogether. Some parts were more soluble than others, but all were soluble, given sufficient time for action.

The Rev. F. C. Lambert had tried to produce local reduction by pouring boiling water upon the gelatine, and it made it leathery—it became practically quite insoluble.

Mr. Bothamley said no doubt that was so.

Mr. Thomas Manly, in reply, said, had Mr. Bothamley tried the effect of putting a solution of bichromate of potash into a test tube, pouring in some fish glue, and then adding a small quantity of a 10 per cent. solution of sulphate of copper? The fish glue was instantly rendered insoluble. It was strange, however, that chrome alum did not make it immediately insoluble. If they substituted chromic acid for bichromate of potash, the effect was the same. It was a result of the experiment that sulphate of copper had the effect of actually rendering quite insoluble the image on the surface of the paper. Ferrous sulphate would make it so insoluble that boiling water would not affect it. Mr. Bothamley was quite right in assuming that it was a question of insolubility, and that of varying degree. If an ozotype print were pigmented with ferrous sulphate and acetic acid alone, then the pigment could not be got away. He had tried most reducing agents, but none of them would act like hydroquinone. The oxidation of hydroquinone would render gelatine insoluble in the presence of chromic acid, or whatever was liberated. He was inclined to think it was the reduction of the chromic acid to $Cr_2O_3CrO_3$. Sulphurous acid reduced chromic acid, but hydroquinone or some phenol reducer must be used. Had any one present tried pyrocatechin? They would find that it coloured the image, but hydroquinone did not.

Mr. Bothamley: Had the lecturer tried aluminium?

Mr. Manly said in three test glasses he placed bichromate of potash and added fish glue to each of them, in one of them ferrous sulphate, and immediately there was a very strong effect. In another chrome alum—a very poor effect. Aluminium also had a very strong effect. The action of copper was certainly this: They had a soluble chromic compound present; directly it came into contact with sulphate of copper the gelatine was rendered insoluble. The experiment with chromates and fish glue was worth a great deal of study. Unsized paper could be used if they were very careful about the temperature of the acetic acid bath, say 78° or 80°, but never higher. He did not think M. Demachy used any size for his work.

THE RONTGEN SOCIETY.

The following are extracts from the annual report for the year ending June 30, 1901:—

During the year 45 new ordinary members have been elected from all parts of the kingdom and the Colonies, and there have been but

few deaths and resignations. The total membership upon closing the accounts were six honorary and 192 ordinary. During the vacation of 1900, the Society suffered a severe loss in the sudden death in September of Mr. Thomas Moore, F.R.C.S., then holding the post of Hon. Treasurer. The average attendance at meetings has been above that of the previous year, showing that increasing interest is taken by the members, and proving to the Council that the present place of meeting is conveniently situated. Papers of great interest, followed by most useful discussions, have been read before the Society during the session. The first place is taken by the President's Address, given by Dr. J. Macintyre, on November 1, 1900. In this address the President dealt most exhaustively with many sides of the X-ray subject. In the course of the address Dr. Macintyre announced his intention of offering a gold medal for the best X-ray tube for practical purposes, an offer very cordially and gratefully received by the Society. The Exhibition evening—with smoking allowed and light refreshments—was again a great success, and its continuance as a permanent feature in each session is evidently desired. The Therapeutic evening—with cases and discussion—was also very well attended, and should, the Council suggests, be a regular fixture. This side of the X-ray question grows rapidly in importance, and one evening in each session at least should be given to it. The thanks of the Council and of the Society are due to the Hon. Secretary, Dr. F. Harrison Low, for his unremitting devotion to the affairs of the Society. He has ungrudgingly given his time to the numerous details which have claimed attention throughout the year, and it is largely owing to his exertions that such excellent subjects for consideration have been provided at the meetings. The Council announces with great pleasure that Mr. Herbert Jackson, F.C.S., has consented to be nominated as President for the coming session. His early researches in the phenomena connected with X rays place him in the foremost position in this country as an exponent of the subject.

News and Notes.

PHOTOGRAPHIC CLUB.—On Wednesday, July 31, there will be a meeting at 8 at Anderton's Hotel. Committee meeting at 7 sharp.

To commemorate the return of the Devon men who volunteered for active service in South Africa, our contemporary, the "Western Morning News," has published an illustrated souvenir of the reception given to the Volunteers at Plymouth. The idea of the souvenir was due to Mr. Ernest Croft, the Secretary and Manager of our contemporary.

WE have received particulars of the Polytechnic Tour to Milan, Venice, Verona, Padua, the Italian Lakes, Lucerne, &c. This tour is open to all, but will afford exceptional opportunities to students of architecture and art photography. The party will be accompanied by Mr. C. F. Mitchell, Lecturer on Architecture at the Polytechnic, and Mr. J. H. Gear, Lecturer on Photography. Every facility will be afforded in the various cities visited for the study of the great Italian masterpieces, both from an architectural and photographic standpoint. To those interested in photography Mr. John H. Gear, F.R.P.S., will give two short lectures upon architectural and hand-camera work, and give instruction to those requiring assistance. He will also take a supply of "Tabloid" Developers and other necessary chemicals, supplying them free to those desirous of developing test and important exposures. The party will leave London on Friday, August 2. The cost of the tour, including second-class travel throughout, and 13 days first-class hotel accommodation, will be £12 12s. Full prospectuses and tickets for the tour may be obtained of the Secretary, The Polytechnic, 309 Regent-street, London, W.

PHOTOGRAPHIC Survey of Manchester and Salford.—This work, which has been for a long period in the hands of a special Sub-Committee of the Manchester Amateur Society, has been brought to a conclusion, although not as complete as it was hoped to make it. A set of the prints has been presented to the Corporation of Manchester, and may be inspected at the Reference Library in King-street. The prints are being exhibited in the cases in the entrance hall, and are changed, we believe, weekly. The President of the Society (the Rev. Henry W. Dick) received a formal acknowledgment from the Corporation in a letter from the Town Clerk, of which the following is a copy:—"At a meeting of the Public Free Libraries Committee of the Council, held the 22nd day of May, 1901, the Chairman and Deputy Chairman reported that on April 25 they received from the Rev. H. W. Dick, Chairman of the Manchester Amateur Photographic Society, an interesting and valuable series of photographs, 232 in number, of buildings in and near Manchester, many of which have been pulled down within recent years. The series is entitled, 'A Photographic Survey of Manchester and Salford,' and it is understood that the Society will from time to time make additions to it.—Resolved:—That the best thanks of this Committee be given to the Manchester Amateur Photographic Society for the valuable and interesting present made by them to the Reference Library."

PHILADELPHIA Photographic Salon, 1901.—The Pennsylvania Academy of the Fine Arts announces that, under joint management with the Photographic Society of Philadelphia, the Philadelphia Photographic Salon for 1901 (fourth year) will be held in the Galleries of the Academy, Broad-street, above arch, from November 18 to December 14, 1901. No awards are offered, and no charge will be made to exhibitors. Each exhibitor will be furnished with a catalogue, which will be the official notification of acceptance. No exhibitor must submit more than ten pictures, each of which must be framed separately. The title of each picture and the exhibitor's name and address must be clearly written on the labels provided, which must be attached by the exhibitor to the back of each picture. Nothing may appear on front of picture except the title and exhibitor's name. All communications and all pictures submitted for exhibition must be addressed to the Pennsylvania Academy of the Fine Arts, Broad-street, above Arch, Philadelphia, Penna., U.S.A. All pictures must be forwarded at owner's risk, carriage prepaid, and delivered at the Academy not later than 5 p.m., Wednesday, October 30, 1901. Foreign contrributors are requested to submit their pictures, unmounted, by post. The management will suitably mount and frame them before exhibition, at no cost to the exhibitor, and will afterwards return them by registered post.

Commercial & Legal Intelligence.

THE Rotary Photographic Company have removed to new premises at 14, New Union-street, Moorfields, E.C.

THE AUSTIN EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The Prize Camera for July has been awarded to Mr. C. Ponting, Flosh House, Keighley, for his negative, "Sunset on the Aue."

MESSRS. Wells and Co., of Avenue-road, Southgate, have issued a new price list of enlarging, platinum and bromide printing, reproductions, postage stamp photos, lantern slides, etc.

ACCORDING to the "Barnet Photographic Record" for July, extension of premises at the Barnet works and increased conveniences for manufacture and output have made it possible to promptly execute a larger number of orders for carbon tissue, and increased confidence may now be felt in getting tissue sensitised or not, in large quantities or small, direct by return of post.

THE Hundred-Thousandth Goerz Lens. — We are informed that the optical establishment of C. P. Goerz at Friedenau, Berlin, has just produced its 100,000th lens—a Goerz double anastigmat, series III., No. 9, focus 60 cm. The event was celebrated by a holiday in all departments of the manufactory. It may be mentioned that the manufacture of Goerz anastigmat lenses was commenced eight years ago.

"THE Photographer."—Messrs. George Mason and Co.'s "Quarterly Journal of Jottings" assumes a new and improved guise with its July issue. It is beautifully printed on good paper, and the contents are well chosen and varied. There is a long and appreciative obituary of the late Mr. G. Mason, with a portrait. "The Photographer" has the following sympathetic reference to the newly formed Professional Photographers' Association: "At last the professional photographers of the United Kingdom have bestirred themselves, and taken action to safeguard their interests. They have been driven to take this step for several reasons, among which may be stated the action of certain large advertising firms, who offered cabinet photographs on premium by means of the coupon principle, as well as other hardships most exasperating to professionals. Already a very large number of photographers have joined the Association, and a general meeting of the members will be held in London on the 2nd inst., when business of much importance will be laid before the meeting by the Executive. The entry money is merely a nominal sum (5s.), and the scheme should be supported by all photographers throughout the kingdom. Mr. Alfred Ellis, 51, Baker-street, London, is Hon. Secretary, to whom all applications for membership should be made.

THE Warwick Competition.—The following is the list of awards in the Warwick Competition for July:—£10 prize, J. W. Eadie, Lenidale, Airdrie, N.B., "Art Gallery, Glasgow;" £5, E. W. Trekle, Photographer, Sparkhill, Birmingham, "Head of a Child;" £1, J. Cannam, Ashley-road, Bristol, "Summer;" £1, C. H. Chaplin, Holme Hale, Crayford, "A Portrait;" £1, J. W. Cooper, Greenway-street, Darwen, "The First Lesson;" £1, Mrs. Josephine Cordiner, St. James' Vicarage, Tavistock-road, Croydon, "The Hope of his House;" £1, F. W. G. Cotsell, Thorne Lea, Extons-road, King's Lynn, "St. Nicholas Church Porch, Lynn;" £1, P. Goodchild, Photographer, 2, Colonnade, Leamington, "A Child Study;" £1, W. D. Gordon, South Villas, Camden-road, London, "St. Margaret's Bay;" £1, E. Heginbotham, Burlington-street, Ashton-under-Lyne, "Haddon Hall Ballroom;" £1, T. L. Hickinbotham, White Ladies' Gate, Clifton, "Thatched Cottage;" £1, W. C. Hope, Park-road, Cowes, I.W., "Yachting in the Solent;" £1, H. J. Horton, Skipton-road, Colne, "Thrushes' Nest and Eggs;" £1, F. H. Lloyd, Barrow-road, Streatham

Common, London, "A Group;" £1, H. G. McBurney, Photographer, Stretford-road, Manchester, "A Portrait;" £1, H. Wilshere-Milton, Sion Hill, Clifton, Bristol, "Piscina, St. Mary's Church, Cheltenham;" £1, D. Murray, Queen-street, Wolverhampton, "An Absent-minded Beggar;" £1, T. R. Nunn, Filey-avenue, Stoke Newington, "Rochester Castle;" £1, Thos. Robertson, Northcote-street, South Shields, "Blasting in Hedley Pit;" £1, F. E. Roofe, 28, Colberg-place, Stamford Hill, London, N., "Mabel;" £1, H. E. F. Toope, 58, Wells-road, Bristol, "Spring;" £1, B. Williams, Tettenhall-road, Wolverhampton, "S.S. Calais-Douvres."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
22	Bradford Photo. Society	Indoor Meeting: Print Night.
27	Ashton-under-Lyne	Excursion: Oughty Bridge (for Wharncliffe Crags. Leader, Mr. Harold Hurst.
27	Hull	Excursion: Holme on Spalding Moor.
27	Thornton Heath	Excursion: Oxted.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 11,—Mr. J. S. Teape in the chair.

Mr. A. J. Brown said that Professor Stebbing had, at the last meeting, referred to the bad prices prevailing in Paris of late, but he thought that London could find instances that were as bad. Quite lately he received a circular offering a dozen photographs for 6d., post free. He rose to the bait, and sent an old photograph, receiving in due course 12 copies, with a penny stamp on the wrapper. They were very good copies indeed, and were of about the size of a postage stamp.

Mr. H. C. Rapson showed some curious effects obtained by printing P.O.P. under rose leaves and fixing without toning. The leaves had a slight tinge of red at their edges, and this tint seemed to be reproduced in the prints, the remaining parts being of various shades of green. He had taken steps to ascertain whether it was due to any transmission of stain from the leaf, but believed that it was not, for where there had undoubtedly been a staining the paper had blackened.

Mr. A. Mackie pointed out that Warnerke had shown that P.O.P. exposed under coloured glasses gave indications of the colours of those glasses.

Mr. A. Haddon remarked that it had been stated that if one took a piece of albumenised paper that had been exposed to light for a short time, or until a slight discolouration had taken place, and then placed a piece of coloured glass over such paper and exposed it to light, one obtained a more or less perfect reproduction of the colours of the glass. He did not believe that those images could be fixed, however, as Mr. Rapson's had been, and that, if one did fix them, one got a uniform tint. In the prints shown, however, one had prints that had been fixed still showing the colours; it would therefore be well worth trying to find the true cause of the phenomenon. Some years ago he had exposed paper, previously degraded as described, to a spectrum which was allowed to fall upon the paper for a certain time, and at the end of which he found there was a decided red tint where the red end of the spectrum fell. He did not remember whether he fixed the print. The experiments were performed long ago by Herschel.

Mr. Haddon then showed a combined dark-room lantern and photographic portable trunk, wherein he was accustomed to carry his plates before and after exposure to keep them from prying hands that had caused him disappointment before, and were directly responsible for his making of the contrivance. It took the form of a strongly made dove-tailed box, the bottom of which was removable, in order that screens could be fitted to act as the front of the lantern. These screens were stowed away in the lid at other times. Candles were burned as the illuminant, and there was ample contrivance for carrying off the results of combustion and introducing a current of fresh air. Five dozen 7½×5 plates could be carried in the box, which was home-made, and under lock and key, in addition to the lantern impedimenta.

Rochester Naturalists' Club (Photographic Section).—A meeting of this club was held last week to consider the reorganization of the photographic section. This section has always had a prominent place in the Rochester Naturalists' Club, but owing to various causes has been somewhat neglected during the past two or three years; and although photography has been assiduously carried out for the greater part of the twenty-five years during which the club has existed, latterly no definite or distinct work has been done by the photographic section. It was with the object of re-stimulating the photographic members that the meeting was called. Mr. Lines, Hon. Treasurer, took the chair; and a President, Vice-President, Secretary, and Committee were duly elected. The objects of the section were then discussed, and a code of rules drawn up. One of the main objects of this section of the Rochester Naturalists' Club is to make a complete photographic survey of the district, embracing a radius of ten miles. The value of this survey in years to come will be great, a complete photographic record being gradually got together, which will show the changes in the district, both from an architectural point of view, and otherwise. Thus a valuable collection of photographs will be got together of buildings that are now, or will be, disappearing, of land that is undergoing changes, either natural or artificial, and form a permanent record of the district. Other suggestions were made by members, and agreed upon, among them that an enlarging lantern be procured for their use, that lectures be given in the winter on similar lines to those held by the Rochester Naturalists' Club, and that the summer excursions be combined with those of the parent club. It was also agreed that each member should contribute a print to a portfolio which would circulate among them, votes being given for the picture thought most of. It was also decided that, if possible, the services of some experienced photographer, such as the editor of one of the photographic journals, should be obtained to criticise the prints, thus helping members in their work. It was further proposed that these pictures be exhibited at the annual conversazione. It was unanimously resolved that there be no additional subscription to become a member of the photographic section, but that all members of the R.N.C. interested in the theory and practice of photography be invited to join the section. Any photographer wishing to join has only to communicate with Mr. F. B. Jefferies, M.R.C.S., &c., Hon. Secretary of the Photographic Section, 4, New-road-avenue, Chatham.

Patent News.

THE following applications for Patents were made between July 1 and July 6, 1901:—

FILM SPOOLS.—No. 13,572.—"Improvements in or relating to Film Spools and the like, and their connexions with Photographic Cameras." JOSEPH THACHER CLARKE.

ROLL-HOLDERS.—No. 13,576. "Improvements in or relating to Photographic Film Roll-holders." SIGMUND GOLDMAN.

CAMERAS.—No. 13,596. "Improvements in and relating to Photographic Cameras." SAMUEL DUNSEITH MCKELLEN.

FILM SPOOLS.—No. 13,695. "Improvements in or relating to Film Spools and the like, and their connexions with Photographic Cameras." JOSEPH THACHER CLARKE.

CAMERAS.—No. 13,697. "An improved Attachment for Photographic Cameras." ALFRED HENRY ROBBINS.

SHUTTERS.—No. 13,702. "An Improved Photographic Shutter." SOLOMON SEBBA and ALCHANAN COHEN.

PRINT WASHER.—No. 13,706.—"An Improved Washer for Photographic Prints." ERNEST ALCWYN MADGE.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ACTION OF BICHROMATE OF POTASH ON THE SKIN.

To the EDITORS.

GENTLEMEN,—That the action of bichromate of potash is usually confined to the hands and arms is true enough in most cases, but not in all. Personal observation in two cases showed rash like measles from head to foot, with great irritation. In one case an assistant of mine became quite unfit for work, and though rest relieved him, still a couple of days' developing brought the rash back in full force. He had to give up carbon printing.

Personally, though developing nearly every day of the week, I am little troubled with any ill effects. During the summer a few patches of irritation will appear on the backs of my hands and round the wrists, which I keep under with a lotion as below, dabbed on with a piece of cloth, and allowed to dry in:—

Water	4 ounces.
Pure carbolic acid	40 grains.
Glycerine	1 ounce.

This formula was taken from an article by Mr. Foxlee in THE BRITISH JOURNAL ALMANAC of 1885.

My advice to any one troubled with this complaint (that is locally) would be: After work to well soak the hands in warm water, using plenty of carbolic soap—"Lifebuoy" does well—or coal tar soap. Dab the hands dry; do not rub, and apply the above lotion.—I am, yours, &c.,

TRADE PRINTER.

THE OPTICS OF TRICOLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Respecting Mr. Ives's criticism of my paper on the above subject, as reported in THE BRITISH JOURNAL OF PHOTOGRAPHY, page 356, a perusal of the complete paper will show the spectroscopic tests referred to are photographed spectrum tests, and therefore perfectly definite and conclusive. The visual tests are simply confirmatory.

The position I take up is not so much that analysis with the Maxwell curves in conjunction with pure colour synthesis is theoretically wrong, as that the method has no practical application, and Mr. Ives in his practice confirms this view by not working the process he teaches, but the one he condemns—that is Professor Maxwell's. My justification for this latter statement is fully set forth in the paper, and when Mr. Ives has examined its full contents he can, if he wishes, dispute the accuracy of the tests recorded.

Meanwhile I shall be very glad to hear what sort of water colour picture will be falsely rendered in every colour by Maxwell's filters? and if Mr. Ives will give us an idea what this is like I will, in return, endeavour to show that by keeping to his Maxwell curves he cannot even reproduce three flat washes of red, green, and blue.—I am, yours, &c.,

HOWARD FARMER.

Polytechnic Institution, July 15, 1901.

THE QUALITY OF BREADTH IN PHOTOGRAPHY

To the EDITORS.

GENTLEMEN,—The old dispute whether photography can lay claim to the dignity of being an art, or not, has been discussed ad nauseam, and not a man is of materially different opinion to that with which he started. Whatever the truth may be, it is certainly the case that such debates invariably tend to the raising of the photographer's standard of taste and execution, and the adoption, little by little, among the rank and file, of ideas and methods that they started by pooh-poohing and shrugging their shoulders at. Whether the camera-craft be an art or not, it is undeniable that the nearer a photograph comes to fulfilling all artistic laws and requirements, the more perfect it is. Even the avowed technician, who declares for a good honest photograph which shall be nothing but the successful result of purely photographic expertness, unconsciously makes use of certain immutable rules that have been known to the artist for centuries, or even he is not satisfied. It would seem, then, that the mechanical nature of his work is never an excuse for ignorance of those rules and principles which apply to the making of pictures, whatever may be the way in which they are produced, whether with brush, pencil or crayon, graving point, carver's or sculptor's tool or, in our case, lens and dry-plate.

One of the most essential and indispensable qualities of anything that attempts to be beautiful is that which is known by the name of breadth, a quality elusive and difficult to explain, but which is infallibly found in all artistic or photographic work of any real excellence. It may be defined as the rendering of the main points and most striking features of the thing or things represented, and the avoidance of all petty and irritating details which are not really necessary to the full expression of the picture. It is the obtaining of a broad and dignified effect that is one of the peculiar difficulties of photography, by reason of the close and minute manner in which the camera seizes and reproduces everything before it, whether desired or not. The very perfection of the process is in this respect its greatest drawback, although, of course, for some purposes it may be a decided recommendation. Artistically considered, our latest superb lenses, with their splendid definition and covering power, are snares and lures for the unwary, tempting them to an unworthy worship of sharpness and detail, where better things might be sought after. Now there is a world of difference between having a picture uniformly sharp, and allowing it to be fuzzy and unsharp in every part. One is more beautiful than the other; indeed, the latter is, if anything, the more objectionable. The most successful picture—and what is a photograph but a picture?—is the one which comes nearest to producing on our minds the same impression and effect that the original would have made. Our eyes do not show us everything as clearly defined and sharp as a needle, nor do they, either, in a healthy and normal state, represent all objects to us with indistinct and softened outlines. The picture or photograph which does either of these things is, therefore, untrue and unsatisfactory. Our eyes do, however, follow the involuntary prompting of the wonderful mental machinery to pay more attention to some things than others, and when we look upon an exquisite view, or a lovely face and figure, we always gaze with attention to some leading feature or features, and scarcely notice the rest. A picture or photograph, then, of that which so attracted us will not produce its full effect unless some parts are emphasised and others subdued or suppressed, or to come to our point, unless the subject is broadly and sympathetically treated. How is it to be done? How is part of the picture to attract the eye more than the rest, when we have to work with such inflexibly truthful tools, which will not gloss over what we would fondly hide, as the artist's brush or pencil may do, but seem to take absolute pleasure in displaying with equal clearness and exactitude at once all that is best and all that is worst in what we wish to represent?

The photographer must learn the lesson of his inevitable limitations, and how by choice of subject, special arrangement and lighting, and the turning of certain properties of his lenses and plates to work for him instead of against him, he may overcome those tendencies to lack of breadth which may otherwise be his despair. It is in portraiture, perhaps, that the attainment of the before-mentioned quality is most difficult and generally more conspicuously absent, and it may not therefore be taken amiss, if the subject is considered more especially with reference to this branch of photographic work. The professional worker in this direction starts, of course, with the great disadvantage that he is obliged, to a certain extent, to accept his sitters as he finds them, suitably dressed or not, and is compelled also, in a great measure, to fall in with their views as to how they will be taken. With all this against him, however, it is quite in his power to adapt circumstances to his own ends and produce work that shall be a lasting pleasure to contemplate. To begin with, he certainly has the matter of backgrounds and accessories within his control, and by displaying taste and judgment in the use of these, can do wonders. Simplicity should, as a rule, be studied in both, and the ornate and striking severely avoided. It does not follow, certainly, that for some subjects highly ornamental details may not with advantage be introduced. It must be remembered that the painter, even, does not confine himself to perpetual Arcadian simplicity in his choice of a background, but, when he thinks it necessary, will introduce the most elaborate ornamentation. What is to be kept in mind is that the sitter must always come first, all else being secondary, and kept in subjection.

The arrangement, posing, and lighting of the sitter are, it is needless to say, of vital importance when breadth of effect is sought after. All that is unnatural and lacking in reposefulness should be shunned, the photographer's aim being to avoid the appearance of any suggestion in his picture that his subject was facing the camera—a result that can only be attained by consummate care and tact. The sitter should be unobtrusively watched, and mental note made of any graceful and fitting position into which he or she unconsciously falls while waiting, and these hints acted upon as the best possible sign-posts and guides to easy and unstrained posing. After all, the latter is a very bad word; we cannot, dare not, pose our sitters, in these days of enlightenment, now that wooden attitudes and glassy stares are at a discount with a more discerning and exacting public. We can only suggest, advise, restrain, smooth out a crease here, gracefully drape a fold there, content ourselves with planing off the rough edges of Nature before introducing it to the all-recording lens and plate.

The lighting of the picture is, naturally, one of the most important things to be considered and studied with a view to attaining artistic breadth of execution. Concentration of light on the chief points of interest, in this case the face and, it may be, the hands, and obtaining a greater or lesser amount of shade over the rest of the arrangement is generally necessary to secure unity and harmony, and prevent the presentation of several clashing and conflicting objects of attraction. Unusual and bizarre effects of lighting are, it goes without saying, productive of a distracting and annoying effect in the resulting photograph; the light should be in complete unison with the general idea and intention of the picture, and quiet and undemonstrative in itself, that is to say, it should pass unnoticed except as part of an harmonious whole.

So much for the arrangement of the original. Nothing now remains but the consideration of how it may most profitably be treated, during its translation into negative and print, to retain those broad and, in the best sense of the word, pictorial qualities that we have probably been at much pains to place in front of our lens. It has already been touched upon to what an extent the definition of different parts of the photograph may be controlled and modified by judicious focussing. It is well to remember, also, the often repeated fact that the use of a large stop gives a broader and more effective rendering of the subject than can be obtained by a small one.

I will not multiply words on the advantages of a full exposure, developing for soft negatives, the choice of a suitable printing process, over which to exercise a certain amount of control and "faking," if it seem fit to us—are they not all written in every photographic text-book? And, alas, after all, what will written or spoken words by the hundred thousand avail to aid in the capture and retention of that admirable and much-desired quality of breadth, unless the worker himself be broad-minded, large-souled, and beauty-sensitive, possessed of the imaginative and creative power that sees dignity and loveliness hidden in common things, and able to bend the mechanical details of his craft, in conformity with his design and intention, to reproduce only what is worth retaining, and reject the petty, frivolous and small.—I am, yours, &c.

BREADTH OF EFFECT.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

H. A. King, 4, Cross-street, Reading. *Photograph of flash of lightning.*

W. Andrews, 13, High-street, Wexford. *Photograph of the Rev. J. Roche.*

Charles & Russell, 10 Royal-avenue, Belfast. *Photograph of Mrs. Patrick Campbell.*

H. J. Kempsell, 1, Railway-terrace, Wallington, Surrey. *Photograph of S. Coleridge-Taylor.*

J. A. Stelling, 60, Peckham-road, S.E. *Photograph of the Revs. J. W. Ewing and A. Adams.*

J. Arnold, 28, Queen's-place, Shoreham, Sussex. *Photograph of cottage damaged by cloud-burst.*

J. Hodge, 62, Durnford-street, East Stonehouse, Devon. *Photograph of group of players and reserves with first team of Devonport Albion Rugby Football Club.*

W. Vick, 12, Stanwick-road, W. Kensington, W. *Two photographs of the interior of St. James's Church, Muswell-hill; and two photographs of the Rev. J. S. Whichelow, A.K.C.*

M. H. B.—The print appears to be a collotype.

OPERATOR writes:—"Before taking a photograph of a church from the highway is it necessary to ask permission of the rector, as I was informed the other day it was illegal not to do so?—In reply: It is not necessary either to ask or obtain the rector's permission. You are quite within your legal rights.

COPYRIGHT.—F. C. J. says there is a very old map of this town, as it was nearly a couple of centuries ago, in the library, and I can obtain permission from the Committee to copy it. When I have copied it, can I make it copyright?—In reply: Yes, you can make your reproduction copyright. But your doing so will not prevent any one else from copying the original, though they may not copy your reproduction.

SALE OF AMATEURS' WORK.—"X Y" writes thus: "I am an amateur, and have taken a number of half-plate views in the neighbourhood, and want to sell copies. What ought the local stationers to give me per dozen for them? One has offered me the ridiculous price of 3d. each mounted."—In reply: All depends upon the quality and artistic excellence of the work, and of that we can form no opinion. Possibly the stationer has taken this into consideration, and offered full value.

COST OF STUDIO.—J. CONWAY says: "Can you give me some idea of the cost of building a studio about 25 ft.×10 ft. on the top of a house? I should like to know which would be the cheapest, one with a lean-to or a ridge roof?"—In reply: We are sorry we cannot, as so much depends upon what has to be done to the roof before the studio is put upon it. The better way will be to get out plans of the proposed studio and its approaches, and then get a local builder to estimate the cost, or give you a price for the work.

COPYRIGHT.—G. A. W. writes: "Some time ago we took some groups. They were not liked; we went again, and took them free of extra charge. These were liked, and ordered from. Since then the rejected ones have become valuable. Is the copyright ours? (2) What are the registration fees? (3) Is it necessary to put copyright on the cards?"—In reply: (1) We should doubt if it is as that was the picture you were really paid for taking, and as it was not approved of, you had to take another. (2) One shilling. (3) Not necessary, but advisable.

SALE OF NEGATIVES AND PRINTS.—R. C. writes: "I have frequently seen advertisements in the JOURNAL for unmounted prints of good portraits, which, I imagine, are wanted to be used as specimens. I have many negatives from which the sitters are not likely to order copies. Is there any hindrance to my selling some to the advertisers?" In reply: Yes, because it would be illegal to do so. The negatives are yours, but it will be illegal for you to supply copies from them except to the order of the sitters. See article on the subject in our issue for June 21.

COPYRIGHT.—R. E. D. writes: "I took two photographs of the opening ceremony of a new church. An amateur has copied my pictures, and is selling copies of same. Can I take any action against him? The photos I did not make copyright. If I made them copyright now could I recover from him for loss through same? Also the best and cheapest way to copyright photographs?"—In reply: You can register the copyright in the pictures, but you will not be able to recover damages for the copies sold prior to the registration. Send two prints, and 1s. 7d. in stamps, and our publishers will effect the registration for you.

ENCAUSTIC PASTE.—G. ROSE writes: "Please tell me how encaustic paste is made, and how it is used for mounting P.O.P. prints; also whether you consider it better than starch for the purpose?"—In reply: Encaustic paste is not a mountant, but a material to be applied to albumen prints after they are mounted, to confer a higher polish and give greater transparency to the shadows. The formula for the paste will be found on page 1079 of the ALMANAC, if you desire to use it.

BOOK ON LENSES.—W. DURHAM writes: "Kindly inform me if there is a book containing particulars of all kinds of photographic lenses."—In reply: "The Optics of Photography and Photographic Lenses," by the late J. Traill Taylor, published by Whittaker & Co., White Hart-street, E.C.

TAKING PHOTOGRAPHS IN THE DARK.—F. W. Donisthorpe asks: "Is it a fact that a photograph can be taken in the dark by rays emitted from sugar? Mr. Isles says in his book that this is so; and also that photographic effects can be got out of bright zinc, wood, charcoal, and paper. If so, why is a plate not affected in its box when it is done up in paper, and the box being made of paper."—In reply: By long keeping, the plates sometimes are. But plate makers, in packing their plates, take every precaution they can for their preservation, and we know that they are usually effective.

COPYRIGHT.—H. Denton & Co. write: "Should we be troubling you too much to reply, through the medium of your valued publication, to the following question? Is a photograph copyrighted or registered at Stationers' Hall protected in the British Colonies? The reason we raise this point is, that we have been informed by the Stationers' Hall authorities that this is so 'under the Imperial law,' but that they do not know whether a bye-law may exist, say, in Australia, Canada, &c., that must first be observed before damages or penalties may be claimed for any infringement, and if you can enlighten us upon this point we shall esteem it a very great favour."—In reply: We are sorry we can give no more information on the point than that you obtained from the authorities at Stationers' Hall. It is possible, if you write to the Secretary of the Photographic Copyright Union, London Chamber of Commerce, Botolph House, Eastcheap, E.C., he may be able to give you some information on the subject.

FIXING.—F. H. KINGSTON writes: "Acid hypo fixing bath: (*a*) hypo, 16 ozs., water, 64 ozs.; (*b*) acetic acid, 6 ozs., sodium sulphite, 1 oz.; (*c*) alum, 1 oz., water, 10 ozs., dissolve and mix and filter after standing 24 hours. This formula was handed me from a friend abroad; will you kindly tell me: 1. If you consider prints are equally permanent (fixed with above) as fixed in the usual method. 2. If it will fix bromide and P.O.P. papers and plates, and about time each should have in this bath. 3. If you suggest any alteration in formula, please quote same. 4. Cause of black and sometimes blue specks on prints, and will a salt and alum bath stop same?"—In reply: 1. We should certainly prefer the usual method. We are no advocates of acid fixing baths, particularly one containing such a large proportion of acid. 2. Yes, but give a longer time than in a plain solution of hyposulphite of soda. 3. If you must use an acid bath, omit at least half the acid and reduce the proportion of alum. 4. Without knowing more of the cause of the spots we cannot suggest a remedy. Better send us an example to see.

CARBON TISSUE.—T. FORBES writes: "I desire to know if you could enlighten me upon the subject I am going to mention, *i.e.*, regarding insolubility of sensitised Carbon Tissue. I am sensitising upon a bath at 3 ozs. of sensitizer to 80 of water, at a temperature of about 50° Fahr., using a few drops of ammonia in the solution; but find my paper is quite hard when I try to develop it. I have tried all remedies I can find in any of the articles on carbon printing, and have not yet found out the cause. After sensitising from 2 to 3 minutes, I place my paper on a greenish chalked ruby glass, and then squeegee all the superfluous bichromate out and place in a room where there has been a gas burning all day, and a temperature of about 100 to 120 degrees is reached; in the morning the tissue is stripped off the glasses and cut up to sizes ready for printing, 'tis after being squeegeed on to the temporary supports and then placed into the water where the trouble comes. The gelatine pigment becomes that hard that I can hardly strip it from the support, in half an hour, and when developed it is covered with nasty, objectionable particles of pigment which cause the prints to look dirty and will not be passed, as our work is of the very highest that can be produced in the process. If you or any of your readers could enlighten me upon the subject I should esteem it a great favour, for I am at a loss to know where it originates from."—We are not at all surprised at the trouble. All text books on the Carbon process give special cautions against drying the tissue where it is exposed to the fumes given off from burning gas, also against drying it at too high a temperature. If the tissue is dried at as high a temperature as 100° or 120° F., and at the same time is exposed to the products of burning coal gas, insolubility must be expected.

NOTICE.

With the present number of the JOURNAL *is given a half-tone photograph of the group of Members of the Sixteenth Annual Photographic Convention of the United Kingdom assembled at Oxford during the week, July 8–13. The negative was taken by Messrs. Hills & Saunders, Cornmarket Street, Oxford. There are* 195 *figures in the group, which is the largest yet photographed at the Convention. A key and list of names will be published next week.*

*** *In consequence of the length of our Convention report, a number of reviews, notices, and other matter, are unavoidably held over till next week.*

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EX CATHEDRÂ.

Photography and Perspective. We think every photographer would do well in reading with the greatest care and attention Dr. Moritz von Rohr's lecture at the recent Photographic Convention. By obtaining a clear perception of the various points he discusses, many difficulties obscuring the mind as to the functions of a lens will be removed. The analysis by which the fact is established, that the perspective of the picture is determined by the distance of the lens from the object, should do much to remove the very prevalent idea that the perspective of a photograph is incorrect. Given a definite standpoint, the focus of the lens only determines the scale of the drawing, or to maintain the illustration with which Dr. von Rohr started, in using a lens we select the definite distance at which the pinhole shall form the image, but by the optician's skill in constructing a lens the pinhole is enlarged, and we obtain more light with which to impress the plate. Where the confusion arises is in the delineation of the subject, probably through force of circumstances, under an unaccustomed angle, and the comparison we make of it mentally with the representation an artist would give us. The artist generally keeps the perspective within narrow limits, and seldom exceeds an angle of 60°. We are not familiar with the appearance of things under a wide angle, and if we wish to appeal to the mind through the eye we shall do well to use the forms we know, rather than invite criticism by presenting them under an uncommon aspect. We may be able to defend them as theoretically correct, but the artist will avoid the difficulty by not placing too much science on his canvas.

* * *

Wide-angle Lenses. As Dr. von Rohr points out, there is no difference in the drawing of a wide-angle lens, as compared with that of a lens of more moderate angle. There is, however, one difference between the two pictures that might be emphasised. If we take any ordinary perspective drawing, we may compare it with the focussing screen. The two are interchangeable. The lens is the artist, and, like him, occupies the station point. If we set up two cameras side by side, one with a wide-angle, and the other with a narrow-angle lens, the individual objects in the latter case would appear larger, but less subject would be included in the picture. Yet, in the case of the wide-angle lens, the perspective appears to be distorted. The fact is, that we have included in our wide-angle picture a nearer plane, which is tantamount to changing the station point. Instead of placing the camera nearer the object, we have placed objects upon the screen which are nearer the camera. The lines of the portions of the picture in the front plane must converge in common with other parallel lines to the same vanishing point, and those near the margin consequently form more acute angles with other lines, and look objectionable.

* * *

Depth of Definition. The manner in which the question of depth of definition was presented by Dr. von Rohr differs from that to which we are generally accustomed. It is usually stated that depth of definition depends upon the relation of aperture to focus. For instance, the late Mr. J. H. Dallmeyer, in his pamphlet on lenses, remarks:—"The shorter the focal length, other things being equal, the greater the depth." Dr. von Rohr assumes ideal perfection in the

lens, which is placed at a definitely fixed distance from the object, and used with a definite diameter of entrance pupil, or aperture. The matter is thus considered independently of the condition of the lens for correction. This is a further step in the direction of simplification. In the case of perspective, we found that the focus of the lens merely determined the linear scale of reduction, and with regard to definition we now find it depends solely upon the diameter of the aperture. The method in which Dr. von Rohr deals with the question of indistinctness is ingenious. If we assume a circle of confusion, and apply it to the photograph in the same way as we do to distinctness of vision, we solve the apparent anomaly of short focus lenses giving greater depth. When we look at the photograph from the correct station point, or enlarge it to the size of one taken with a longer focus lens, the circle of confusion is brought under the same visual angle, and there is no apparent difference.

* * *

Rapidity of Small Lenses. Having dealt with the chief optical factors of the problem, Dr. von Rohr, as might be expected, pointed out wherein lay the chief advantage of the small lens and the small negative. Given two lenses of different focal lengths, but the same aperture, the rapidity will increase with the square of the diminution of the focus. This gives the shorter focus lens a very great advantage, and in the hands of an expert photographer it becomes the means o fextendin gits usefulness enormously. But with reduction in the size of the negative, perfection of apparatus should go hand-in-hand, if the best results are to be obtained by subsequent enlargement. Careful attention should be given to every important detail in the adjustment of the camera. The register of the plate with the focal plane should be perfect, the lens should be well corrected, and the photographer should train himself to judge distance accurately. The quick perception of the right moment to expose seems to be a special gift, but even in this practice will be found of the highest value to the operator of average ability.

* * *

July Meteors. From July 27 to 31 there are usually to be seen showers of meteors radiating from Aquarius that ought to offer inducements to photographers to obtain pictures of them. But so far, the camera has been of little use to astronomy, for Mr. W. F. Denning, in "Nature," writes as follows:—"In previous years much has been effected at the July and August epoch, but still more remains to be done. Photography, of which so much was expected, has achieved little; but its possibilities are great, and it may ultimately prove as successful in this department as it has done in several others. The fact, however, remains that we are still mainly dependent upon eye observations, though they are no more than rough estimates of position, and scarcely capable of being usefully employed in any refined or critical investigation of the subject. . . . Much additional data are required, and as photography has hitherto supplied very meagre results, observers have to fall back upon the old-time method as vastly more productive if far less precise. It will be remembered that, some years ago, it was thought that the photographic plate would soon supersede the observer in regard to the delineation of planetary detail, but this idea has not been realised." We have somewhat fully quoted Mr. Denning's remarks in the hope that some of our readers may take up the gage he virtually throws down, and show in the future that photography can, and will, benefit astronomy in this particular direction.

* * *

A New Storage Cell. When the Faure Planté storage cell was first invented, and the newspapers flooded us with accounts of "concentrated electricity," so many misleading ideas and false hopes were generated, that to this day most erroneous ideas regarding accumulators are current. It had been hoped by many, till they were undeceived, that by the use of storage batteries any and every electric requirement of the photographer could be easily met—arc lighting for portraits, a switch lamp for his dark room, another for photo-micrographic operations, and lately a ready-made current for Röntgen ray work. Well, we all know that accumulators can do this work, but it is not every one who mentally realises the difficulties—the need for occasional charging of accumulators, though they may never have been used, their non-portability, their liability with unskilled labour to short circuit, to buckle, and, altogether, to produce infinite trouble if the current is not on the spot, in which case their raison d'être in so many instances ceases. There is, however, now a definite scientific impression that all this will be changed by the invention of an entirely new storage battery by Mr. Edison. It is no mere rumour that Mr. Edison has invented a cell entirely new in plan, and which appears to have great promise. Mr. Edison in his researches and experiments set before himself five requirements that a new cell should possess. They were (1) absence of deterioration by work; (2) large storage capacity per unit of mass; (3) capability of being rapidly charged and discharged; (4) ability to withstand careless treatment; (5) inexpensiveness. Dr. A. E. Kennedy, at the recent annual meeting of the American Institute of Electrical Engineers, gave a full description of the cell. Beyond saying that it is quite new in principle, the lead sheets being replaced by iron and an oxide of nickel, the electrolyte being caustic potash solution, it is beyond the province of this JOURNAL to give details. But its success is said to be pronounced, and with a given weight of battery, for instance, the Edison cell will give out perhaps three or more times the amount of electricity, while as for lasting out rough usage it is stated that it may, without damage, be allowed to completely run down, and remain so, or even charged the wrong way about—two conditions fatal to the lead cell. It is evident that such a cell—portable and efficient—should, in photography alone, be an enormous boon, and we shall anxiously await its commercial introduction.

ESTIMATING THE VALUE OF A PHOTOGRAPHIC BUSINESS.

OUR advertisement columns, week by week, show that there is no dearth of photographic businesses for sale. There may be, and doubtless are, various reasons for this. Possibly the two principal ones are: (1) that the vendors have already realised a competency from them and wish to retire; or (2) that their owners do not find them, to their ideas, sufficiently remunerative, and, for that reason, desire to dispose of them. We fear from the returns often quoted that the latter is more frequently the case than the former. It is interesting to note the differences in the turnovers given in the advertisements. These vary from two hundred, or less, pounds a year to as many thousands, and more. Now, it is difficult to

imagine, when the gross returns of a business are less than the salaries paid to many operators, what is the value of the goodwill itself of such a business, or if it is really worth anything at all beyond the value of the plant and fixtures? We are frequently asked, through the correspondence column, to give an idea of the value of a business with such and such a turnover, and with no further details than the mere statement of what they are. Even if full particulars were given it is quite without our province to assess the value of businesses, hence, of course, we always decline to offer any opinion whatever on the subject.

Although we, necessarily, decline to express any opinion as to the value of the goodwill of a photographic business, there is no reason why we should not point out some of the things that should be taken into account when purchasing or selling one. One of the first things to do is to make sure that the returns stated are bonâ fide. These are usually based on an average for the three previous years; but it will be well to have the years separately, as then the would-be purchaser could see if the business was an improving one, or one that was going down, for it is obvious that one that is declining is not worth so much as one that is steadily increasing. Then there is the cost of rent, taxes, cost of advertising, &c., as well as the annual sum paid in salaries to be taken into consideration. These must be considered in conjunction with the prices charged for pictures, and that is a very important point, because on that the net profits depend, and not upon the actual turnover.

A business with a small turnover may yield a much larger profit than another where it is three or four times as great. The prices of, say, cabinet portraits, which may now be taken as a standard size, vary with different classes of businesses—from seven and sixpence, or less, per dozen to a guinea and upward. Now, there is no very material difference in the actual cost of material for the one class than there is for the other, but there is a wide difference in the profits on the two classes of businesses. For example, if an article cost, say, four shillings to produce, and it is sold for seven and sixpence, the profit on it is three and sixpence. But if it is sold, say, for double—fifteen shillings—the profit is eleven shillings or over three times the former sum. If it be sold for, say, a guinea, the profit is then seventeen shillings, or nearly five times what it is on the seven-and-sixpenny transaction. We merely quote this simple illustration to show that the returns may be a fourth, or less, in one case than they are in another, and yet yield a larger profit. The importance of the due consideration of prices, we know, is not so fully realised as it should be by some who start in photography for the first time.

In purchasing a business, opposition, present and prospective, should receive consideration. It is usual in buying a business to stipulate that the seller shall not commence, or carry on, a similar business in the locality. But, of course, this stipulation does not control any of his employés, who perhaps may commence a business in the immediate neighbourhood. This has more than once been the case with branch businesses that have been carried on by a manager, who, when the business has been disposed of, has commenced a new one close by, to the great injury of the new comer. A point in connection with the value of a photographic business is the locality. If the inhabitants are ever changing, as they are at some of the all-the-year-round health resorts, the prospect is much better than it is where the residents are fixed, year after year, as they are in some small provincial towns, and where a portrait once taken suffices for a long time.

With businesses which are largely dependent upon the "club system" the expenses in connection with agents and canvassers' commissions are a considerable item, and should always be taken into account when estimating the profits. There are some businesses that may be only yielding a moderate profit, but if the returns could be increased by one or two hundred pounds a year, the profits would be more, perhaps, than doubled, as the expenses so far as rent, wages, &c., would remain the same. There are few businesses where the hands are so fully employed that they could not turn out considerably more work, if they only had it to do, so that the extra trade would not add to the expenses.

Here is another point that should receive attention on the part of the purchaser, namely, the manner in which the business has been run for the year or so previously. It is, or was, by no means an uncommon thing for an enterprising man to take, or start, a business in a small provincial town, and then by most energetic methods get together, within a short time, a very good business, and then sell it for a good sum, as the well-kept books show that a bonâ fide large trade has been done. But in the getting up of the business the inhabitants have become so well supplied with portraits that but few more will be required for some time to come. To apply a somewhat common expression, the orange was sucked nearly dry before it was disposed of.

We have not attempted to allude to all the points that should be gone into when purchasing a business, but what has been said may doubtless be of use to novices about to enter the photographic profession.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The first meeting of the Committee of the Professional Photographers' Association was held on Friday evening last, July 19. The President, Mr. Thomas Bedding, F.R.P.S., occupied the chair, and there were present:—Messrs. H. Walter Barnett (Vice-President); Harold Baker; F. A. Bridge; Ernest Elliott; H. E. Hull; Martin Jacolette; Alexander Mackie; Lang Sims; Gustave Mullins (Ryde); Henry C. Spink (Brighton); William Grove (Honorary Treasurer); E. W. Simmons (Assistant Secretary); and Alfred Ellis (Honorary Secretary). Letters of apology for non-attendance were read from Messrs. T. C. Turner (Hull); H. Hallier J. Caswall Smith (London); Birtles (Warrington); W. Crooke (Edinburgh); W. H. Midwinter (Bristol); G. W. Morgan (Aberdeen); &c., &c.

The appointments of the Honorary Secretary, the Honorary Treasurer, and the Honorary Solicitor, which were made at the first Annual General Meeting on July 2, were confirmed by the Committee, who also elected Mr. E. W. Simmons, to the post of Assistant Secretary.

The principal business before the meeting was the choice of the following Sub-Committees:

General Purposes Sub-Committee.

F. A. Bridge. Ernest Elliott (Elliott & Fry).
Martin Jacolette. Alexander Mackie.
H. C. Spink (Brighton).

Local Branches Organization Sub-Committee.

Harold Baker (Birmingham). W. Barry (Hull).
T. Birtles (Warrington). W. Crooke (Edinburgh).
W. H. Midwinter (Bristol). G. W. Morgan (Aberdeen).
Gustave Mullins (Ryde). H. C. Spink (Brighton).
W. D. Valentine J.P. (Dundee). H. J. Whitlock (Birmingham).
G. W. Webster (Chester).

Honorary Secretary, T. C. Turner, 8, Regents-terrace, Hull.

The Committee decided that the President, Vice-President, Honorary Treasurer and Honorary Secretary shall be ex-officio members of all Committees.

It may be mentioned that the whole of the business of the Association will in the first instance be brought before the General Purposes Sub-Committee, which will possess emergency powers.

At an early date a little book embodying the lists of officers, committees, members, rules, a brief account of the proceedings of the Association since its formation; a membership form and other data will be sent to all the members, who will be asked to distribute copies amongst professional photographers who have not yet joined the Association. The next general meeting of the Association will be held in October next; but during the next few months the work of organization will be steadily proceeding, and the efforts of the Committees will no doubt be directed towards increasing the membership of the Association and defining its sphere of work. Meanwhile it is our intention to present in these pages, week by week, a series of articles setting forth reasons why the Association should command the active and hearty support of all professional photographers.

The Professional Photographers' Association is but a seedling at present. It would be unreasonable to expect it to bear fruit at this early stage of its growth. Nevertheless, taking part in this year's Convention there were a few professional photographers whose faces are rarely to be seen at gatherings, social or otherwise, of the photographic fraternity. We have reason to know that the presence of these welcome additions to the ranks of the conventioners is a result directly attributable to the meetings that have been held in connection with the establishment of the Professional Photographers' Association. We believe that the majority of professional photographers would feel profoundly astonished, if they would take the existing opportunities of meeting their brethren on the level and apart from the influence of local jealousies, at discovering what good fellows and genial companions even their business competitors are. A horse shies at a wheelbarrow by the roadside because, in his ignorance, he fears it. With much persuasion and coaxing he is led to convince himself that it is a very innocent object and can do him no harm. It seems that almost as much persuasion and coaxing are required to convince the average professional photographer that every camera which he meets with on the highway of life is not placed there expressly for the purpose of doing him an injury. We are loth to liken a photographer to a shying horse; but, really, there are cases where, if the matter be studied from a psychological point of view, the mental attitude of the two will be found to be not unlike, and manifested in a similar way. The shying of a horse is his effort to avoid going near the object of his fear, and if the tendency is not checked at an early age the habit becomes constitutional and incurable. Many photographers studiously avoid meeting their brethren, and often the habit has become constitutional, but, we hope, not incurable. Nature intended the photographer for a gregarious animal. The amateur follows his natural instinct, and loves to congregate. The professional violates nature, and segregates himself. The Professional Photographers' Association, though it has not commenced serious work yet, has already shown distinct signs of the good it will do in promoting friendly intercourse between professional photographers. This is, of course, only a means to an end, and, though desirable in itself and a not unworthy item in the programme, is not the sole or most important end for which the Association was established. That is, broadly, the promotion of the interests of professional photographers in their professional work. The common interests of professional photographers are far more numerous than the conflicting ones, but it is impossible to come to an agreement which of those common interests can be controlled and promoted by a defensive alliance, still less to settle the plan of campaign, unless a large proportion of the photographers throughout the country are in friendly intercourse and in friendly correspondence. The Professional Photographers' Association provides an opportunity which has not hitherto been available for the discussion of the business side of photography. Every professional photographer in business for himself can claim membership as a right, and, be his position never so lowly, provided he answers the description of "a person engaged in the commercial production of photographs in business on his own account or in partnership, or as responsible manager of a firm or company," he will be as warmly welcomed as though his turnover ran into thousands a year.

To return to our simile, now is the time to cure oneself of that fatal habit of shying at one's brethren. There is a Latin motto, "Bis dat qui cito dat." We may paraphrase it: He who joins at once is twice as valuable an ally as he who hesitates until the fight is nearly won.

THE TREATMENT OF DISEASE BY LIGHT.

[Reprinted from "Nature."]

PHOTOTHERAPY, or the treatment of disease by light, has now, thanks to Professor Finsen, of Copenhagen, a recognised place in the domain of therapeutics. Finsen's first paper on the subject was published in 1893. In it he showed that the chemical or ultra-violet rays of the spectrum have a definite effect upon the course of small-pox, and he proposed that patients suffering from this disease should be kept in rooms from which the chemical rays of light were excluded by means of red curtains or red glass, in the same way that a photographer excludes these rays from his plates and paper. In an ordinary case of small-pox treated under the usual conditions, the eruption passes from the vesicular to the suppurative or pus-forming stage, and this condition is most marked upon the face and hands, the parts most exposed to light. It is in consequence of the destruction of the skin attendant upon the suppuration that the face and hands are so commonly the seat of hideous scars. Finsen's suggestion has been carried out with considerable success. In nearly every case in which the patient was kept in red light from the onset of the disease, there has been found to be a marked change in the course of the eruption. The suppuration and its attendant secondary fever have been almost, if not entirely, abolished, and as a result the patients recover with little, if any, scarring.

Finsen's next researches were made upon the action of light as an irritant, and they are of extreme interest to the biologist. It will suffice here to say that he found that the animal organism, especially in creatures which prefer to dwell in the dark, is markedly irritated by the chemical rays, while the other parts of the spectrum are non-irritant. From this he was led to investigate the effects of light upon bacteria. Here the field had already been occupied by Downes and Blunt, who, in 1878, in a paper read before the Royal Society, showed that the chemical rays are bactericidal. Duclaux, Arloing, and others have worked upon the same lines and confirmed their results. It therefore seemed probable that superficial diseases of the skin caused by bacteria could be cured by the application of light. Of these, one of the most important and most intractable is lupus. Finsen, however, argued that the intensity of ordinary sunlight is obviously insufficient to kill the microbes as they lie in the skin, for lupus is particularly a disease of the face, which is more exposed to the sun than any other part. He therefore tried the effect of concentrating the light by means of lenses, cutting out the red and ultra-red rays by a blue medium. He found that cultures of micro-organisms *in vitro* were much more powerfully influenced by the concentrated rays. The sun's rays concentrated by the apparatus to be presently described were fifteen times stronger than ordinary sunlight. Powerful electric arc lights were also tried, and with a lamp of from thirty-five to fifty ampères the effect was similar to that of the sun, or even greater.

The next point to be determined was the penetrative power of light. For this purpose small sealed tubes containing silver salts were placed under the skin of animals and exposed to the concentrated light, and the silver was found to be blackened.

The effect of the blood circulating in the tissues was next demonstrated by a very ingenious experiment. A piece of photographic paper was placed behind the ear, and the outside of the lobule was exposed to the light. In about five minutes the paper was blackened. The experiment was then tried with the ear compressed between two

pieces of glass so that it was rendered bloodless. The photographic paper was blackened by the light in twenty seconds. The absence of the red colouring matter of the blood allowed the chemical rays to penetrate with great ease.

The apparatus devised by Finsen for the treatment of lupus by the sun's rays consists of a large hollow plano-convex lens, filled with an ammoniacal solution of sulphate of copper and mounted upon a fork-like metal stand, so arranged that the lens can be moved about a horizontal and also round a vertical axis, and lowered and raised at will. The filtered sun's rays are focussed upon the area of skin to be treated, and at this spot is placed the compression apparatus. This is a very flat cylinder made of two plates of rock crystal fixed in a metal ring. Through the compression apparatus passes a current of cold water, so that the instrument is used to render the part to be treated bloodless and also to cool it. The pressure apparatus is held on the skin by a nurse throughout the whole sitting, which lasts one hour or a little more. The spot treated at each sitting is about the size of a sixpence.

The electric light apparatus is much larger and more complicated. Attached to a strong metal ring round a large arc lamp, of 30,000 to 35,000 candle-power, are four long cylinders like telescopes. Each telescope consists of two parts. The upper part, closed at each end by rock crystal lenses, makes the divergent rays of the arc light parallel, and the lower piece brings the rays, thus rendered parallel, to a focus on the skin of the patient. The lower part of the apparatus is filled with distilled water and is surrounded with a jacket through which cold water circulates. The compression apparatus used for the sun treatment is placed, as before, at the focus of the light to render the skin bloodless and to keep it cool. The length of the sitting is one hour. There is no blue solution in the electric light apparatus as now made, as it has been found in practice that the tube of distilled water and the circulating water in the pressure glass are sufficient to absorb the comparatively small amount of heat-rays given off by the arc light. Rock crystal lenses are used because ordinary crown glass prevents a great part of the chemical rays from passing through.

As a result of an hour's application of the light the skin may be a little red, but there is no proper reaction for from six to twelve hours, when there is definite redness and swelling and sometimes slight blistering. In from three to seven days all trace of reaction has usually disappeared, and the skin, though still hyperæmic, can be treated again if necessary. The process is repeated over the whole of the diseased area and especially at its margins, the most active parts, until every sign of lupus tissue has disappeared. If the disease is extensive, the treatment lasts many months. It must be noted that in many of the bad cases not only is the skin affected, but also the mucous membranes lining the mouth and nose, and these parts can very rarely be influenced by the light.

In Copenhagen there is a Light Institute under the direction of Professor Finsen, and a very large number of patients, more than 500, have passed through the institution. It was in Copenhagen that the Queen saw the treatment, and Her Majesty was so impressed with the good results attained there that she graciously presented a set of the apparatus to the London Hospital a little more than a year ago. The demands upon that institution became so great that a second and a third lamp had to be put up, and even with these it is impossible to cope with the influx of patients from all part of the British Isles, and even from such distant colonies as Newfoundland and New Zealand.

The drawbacks to the treatment are, first, the length of time which a severe case takes, and, secondly, the cost. Not only is there the cost of the electric light and the necessary maintenance, but every patient has to be attended by a nurse. At the London Hospital it has been found that it costs about 400*l.* or more a year to run one lamp, so that the light department there necessitates an expenditure of 1200*l.* a year. It is. therefore, gratifying to find that Mr. Alfred Harmsworth has come forward and endowed one lamp by a munificent gift of 10,000*l.*

It must be noted also that public spirit in Manchester and Liverpool will shortly provide for the installation of the light treatment in these cities.

The results in cases of ordinary lupus are excellent, provided that the patients can remain continuously under treatment for a sufficient length of time. The average of a large number of cases is three months. Certain other diseases, lupus erythematosus, rodent ulcer and alopecia areata, are influenced favourably by the light treatment. In the first-mentioned disease the results are not nearly so striking as in the common form of lupus, but about one-third of the cases do well.

The light treatment has been too recently tried in London for any definite statement to be made as to the permanence of the results. In Copenhagen it has been in use for five years, and some of the earliest cases are quite free from recurrence to date.

The important advantages of this method of treatment over every other which has been used for lupus are that there is no destruction of tissue, there is no operation, and therefore no anæsthesia, for the treatment is painless, and, last but not least, in a disease which attacks the face the cosmetic results are wonderful. The skin of the areas treated is soft, supple and pale, and in some cases so nearly resembles the healthy skin that it requires careful observation to detect the difference. As we have already mentioned, the drawbacks are the time and the expense, and the impossibility of treating the mucous surfaces. If a cheaper method of application, with shorter exposures and the possibility of treating a larger area at one sitting, is introduced, there is no doubt that the light treatment will be used in every hospital where a suitable electrical installation is obtainable.

A SIMPLE AND INCLUSIVE METHOD OF TESTING PLATES.*

II.

Sensitiveness to Colours.

The estimation of comparative colour sensitiveness is done first by a cursory inspection of the results obtained under the colour patches. Regard must also be had to the graduated tints to see that the exposure has been sufficient to give the more feeble sensitiveness to green, yellow, and red, time to assert itself if present. If, for example, the density produced under the blue square is about equal to that of the tint No. 8, and the exposure has been too short to produce any impression under the tints denser than No. 12, then unless the sensitiveness to the yellow, green, or red of the light that is being employed is equal to or exceeds about a fourth of the sensitiveness to the blue (the total sensitiveness of an ordinary plate) the special colour sensitiveness will have no opportunity of showing itself. Such an ill-judged exposure shows that the colour sensitiveness is less than about one-fourth of the other and that it may be anything up to this limit. The exposure, on the other hand, must not be excessive. If by reason of over-exposure several tints of the graduated series give densities that can hardly be distinguished from each other and the densities under the coloured squares match these tints, there is obviously a loss of discriminating power. In an actual example, the densities produced under the blue and the green squares were found to fairly match any density numbered from 8 to 11, showing that either the blue and green might have produced about three times the effect of the other, or that the difference between them might be anything between these two extremes. As a matter of fact in this case a less exposure showed that the blue matched the 8, and the green the 11 square, the plate requiring, with the given light used, three times as much exposure for the green as for the blue to produce equal results. One great advantage of the apparatus is that such errors of exposure are obvious, and the range of uncertainty, and therefore of possible error, can at once be estimated.

In order to compare one density with another on the trial plate with any approach to accuracy, it is necessary to isolate the two patches that are under observation. The thick black paper supplied to protect sensitive films on spools is an excellent material for this purpose. Convenient-sized pieces are used, each with a hole about $\frac{1}{16}$ inch in diameter. One is placed over a square to be valued, and another passed along the graduated series until a match is made.

* Concluded from page 54 (Supplement), July 5, 1901.

A piece of white card or paper forms a convenient background, btu it is important that it should be evenly illuminated.

In determining the proportional colour sensitiveness, although extremes of under and over-exposure must be avoided, there is a very considerable range of exposure that will give satisfactory results, and it makes no difference what the exposure is so long as it falls within these limits. Nor does the duration of development or the density of the plate as a whole affect the result so long as there is sufficient density to enable one to distinguish between the adjacent squares of the graduated series, because whatever affects the density of the deposit under the colour patch also affects the graduated series with which it is compared. The table here given illustrates the methods of determining the comparative sensitiveness of various plates to different colours. Ten plates are dealt with in the table; Nos. 3, 4, 5, 6, and 7 are from the same box, and Nos. 4, 5, 6, and 7 were developed together. Nos. 8, 9, and 10 are from the same box, and Nos. 8 and 9 are parts of the same plate and developed together. The simultaneous development is not necessary, and it was done for other purposes than the results here given. All the exposures were to candlelight.

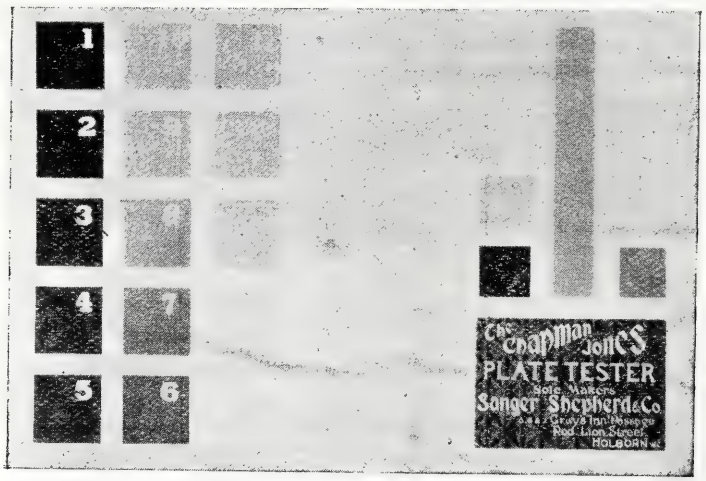


Fig. 5.—Reproduction of a Test with a Cadett Ordinary Plate.

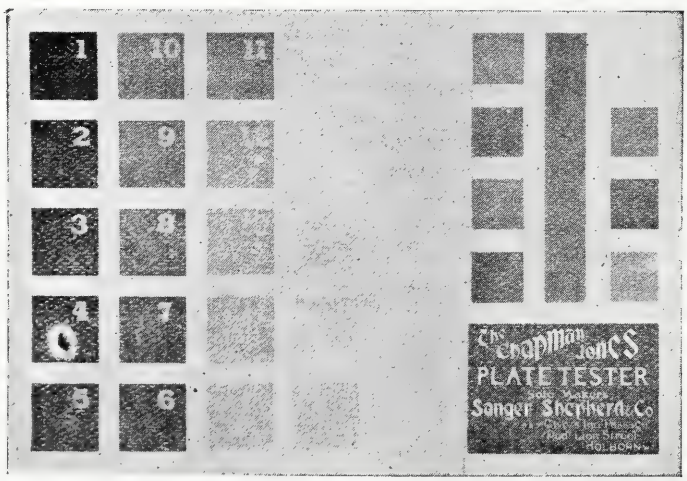


Fig. 6.—A Cadett Spectrum Plate.

Both were exposed at one foot from a standard candle for thirty seconds and developed together.

Obviously there is no absolute significance in the exposures required for the different colours, as, if the light used had been more blue, like daylight, the proportional values for blue would have gone up—that is, the figures indicating the exposures necessary would have been less. But such a change would affect the results of all the plates alike—if the exposure required for the blue were halved in one case it would be halved in all, so that the value of one plate as compared with another would remain unaffected. In the series 3 to 7 the effect of varying exposure is well shown. The least exposure (4) shows an effect only under the blue; the next (3) shows a slight effect under the green, but its value is uncertain, because the 12 square of the graduated series is just on the limit of the developable effect. No. 5 gives the green dense enough to measure it, No. 6 gives the red, and the last (7) gives the red well, but the blue is getting towards the over-exposure portion of the graduated tints. Where the number of the graduated tint matching the effect produced through each colour is marked as O, it indicates that the exposure has been insufficient to give enough range to produce an effect under that colour. In No. 10, considerable over-exposure is shown, for the densities under the blue, green, and first red may be equal to anything in the graduated series from 8 to 11; but the fact that the deposits under the colours are, perhaps, levelled up by over-exposure and not by an equal colour sensitiveness of the plate, is plainly obvious by the fact that so much difference in exposure produced no obvious difference in density in the graduated tints mentioned—that is, no difference detectable by the simple method of comparison above described. Differences can be found and measured by more exact methods, but all the results given in the table were obtained by simple comparison of the densities, using nothing more than pieces of black paper with a hole in each to isolate the parts to be compared.

Plates.	General sensitiveness to candle light. — Proportional figures.			Sensitiveness to different colours.																	
				The number of the graduated tint that matches the effect produced through each colour.								Previous section expressed as *proportional exposures* necessary for uniform results on *each plate*.				Previous sections multiplied by the exposure required for individual plates, giving *proportional exposures required, comparable throughout*.			
	Exposures.	Effects of exposures.	Exposures for same effect.	Blue.		Green.		Red (1).		Red (2).		Blue.	Green.	Red (1).	Red (2).	Blue.	Green.	Red (1).	Red (2).
A. 1	4	6	⅔	8		14		7		12		1·5	12	1	6	1	8	·7	4
B. 2	4	6	⅔	9		11		15		0		2	4	16	—	1·3	2·7	11	—
C. 3	2	2	1	7		12 ?		0		0		1	—	—	—	—	—	—	—
C. 4	1	1	1	7		0		0		0		—	7	—	—	—	7	—	—
C. 5	4	4	1	7		12·5		0		0		1	6	32	—	1	6	32	—
C. 6	16	16	1	7		12		17		0		1	6	32	—	1	6	32	—
C. 7	32 ?	—	—	7 ?		12		17		0		1	6	32	—	1	6	32	—
D. 8	16	4	4	8		11		13		0		1·5	4	8	32	6	16	32	128
D. 9	64	16	4	8		11		13		17		1·5	4	8	32	6	16	32	—
D. 10	512	128	4	8 to 11		8 to 11		8 to 11		17		—	—	—	32	—	—	—	—

The last section of the table shows a kind of result that is often useful. The plates C are four times as sensitive to candlelight as the plates D. But to pure red light (less refrangible than Fraunhofer's D) these plates are equally sensitive, the additional sensitiveness of C being wholly in the blue and green. Where pure red has to be dealt with, therefore, the slower plates D will be comparable to the more rapid plates C used in conjunction with a coloured screen to reduce the effects by the blue and green. For spectrum work, for example,

if the red is wanted and must therefore be exposed for, the extra sensitiveness of the plates C is not only unnecessary but positively troublesome. Using both without a coloured screen, the plates D will

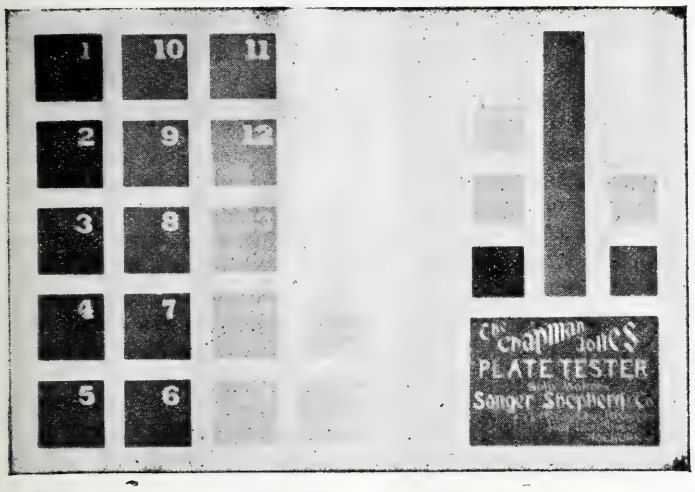


FIG. 7.—An Isochromatic Plate, exposed to daylight in the camera.

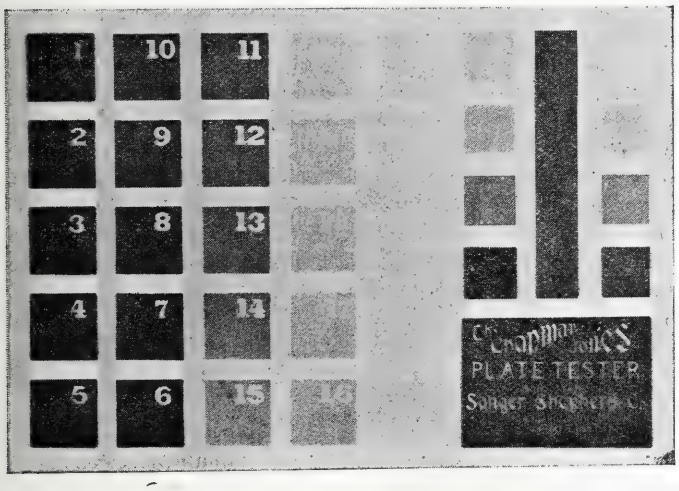


FIG. 8.—A Cadett Spectrum Plate, exposed to daylight in the camera.

require no longer exposure and will give a more even and desirable result. But if red sensitiveness is wanted, notice the enormous advantage of plate number 1 (A) which is more than forty times as sensitive to red as the plates C and D, but is at the same time markedly deficient in green sensitiveness. There is no need to dwell on other results shown by the table: it is given only to illustrate the possibilities of this method of work, without supplementing it with any other instrumental means.

Dark-room Illumination.

The light used for the development or other manipulation of the plate may include light of all those colours that do not affect it. Ordinary plates show a result under the blue square only, the red and the green are therefore available as a dark-room light. A good yellow transmits red and green and forms an appropriate medium in this case. Isochromatic plates are affected also under the green square, and the red only remains as a satisfactorily safe light. A thickness of red fabric added to the two or three thicknesses of yellow will give such a light. Of plates sensitive to red, some, such as Cadett's spectrum plates, are sensitive only to the more refrangible red, the red less refrangible than about Fraunhofer C being reserved as a useful light for the working of them in. This reservation is obvious by the want of effect under the second red square, and by the use of suitable dyes screens can be prepared that transmit only this part of the red. I find it convenient to keep these three grades of light always ready for use. Some plates, such as Lumière's "red and yellow" and "panchromatic" plates, are most advantageously worked in a feeble green light, and this fact is demonstrated at once by the plate tested showing a result under all four squares, but by far the most feeble result under the green.

Halation.

With regard to halation, different plates can be compared in a usefully quantitative way, by comparing the numbered tints in the graduated series that show where halation notably begins. The effects of colour on halation can be seen by looking to the results under the coloured squares, but this will generally require a specially long exposure, as with ordinary exposures the effects under the green and red squares are hardly dense enough to show halation. A red backing, for example, may prevent the halation of blue light but not of red; it may be useful for ordinary plates but not for red-sensitive plates.

The information referred to so far can be obtained from a single plate that has been exposed in the apparatus, providing only that the exposure has not been either greater or less than the very considerable range that is available. If an error in exposure has been made it will be clearly obvious as soon as development is complete and before fixing, and an inspection of the graduated tints will show exactly what alteration in the exposure is necessary. Such a failure will never occur except when using a new plate to the general sensitiveness of which one has no guide. The idea is that the user of the instrument will test in this way every batch of plates that he receives, and label and preserve the test plates. These can then be compared with the similar test results of any batch afterwards received, and the differences, if any, estimated. Thus the photographer, knowing by experience what conditions suit the plates he is using, will know exactly what variations, if any, are necessary to get the same results with any batch that he may subsequently employ. And he gets this information at once and on one plate, instead of making a few dozen unsatisfactory negatives, and endeavouring to discover from them the reason of their unsatisfactory character—a tedious, wasteful, and almost impossible task.

Effects of Colour Screens.

In addition to this the apparatus is available for determining in a roughly, but generally sufficiently accurate, quantitative manner any of the conditions that affect the results obtained upon photographic plates. For comparing the efficiencies of colour screens or light filters, in order to select the one that will best give the result wanted, whatever that may be, this apparatus is pre-eminently suitable. Of course it is of *general* applicability, and does not pretend to compete with *special* methods arranged to suit one specific purpose only, as, for example, the colour patches or discs as arranged by Sir William Abney for the adjustment of screens to plates for the three-colour process of reproduction. Nor does it pretend to compete with the far more elaborate and more perfected colour sensitometers, such as those used by Mr. Sanger Shepherd in the adjustment of his colour screens. Such apparatus as this is very costly, and so limited in its application that it would be of but little use to the large majority of photographers.

To test the suitability of colour screens for use with any specific plate for ordinary work, the desire being to correctly render various colours as seen by daylight, the plate should be exposed in a camera behind the compound screen of the apparatus. Almost any dark slide will accommodate the two together. The lens and the colour screen to be tested are attached to the camera as usual, and the exposure is made on a white surface, such as a piece of card or sheet of cartridge paper, arranged as if for illuminating a negative for enlargement. Any exposure within a considerable range will serve equally well, and it will be convenient, instead of timing the exposure, to estimate it in units of light (tints) as determined by one or other of the exposure meters now so generally used. The exposure meter should be placed by the side of the white surface so that the light falls equally on it and on the sensitive paper of the meter. I have found Watkins' "indoor meter" particularly serviceable for this purpose.

If the screen is perfectly adapted to the plate, the four inner colours, blue, green, yellow, and red, and the grey strip, will give

patches on the plate of practically equal density. If the plate is only slightly sensitive to red, or the screen is not intended to correct for this colour, then the blue, green, and yellow squares, and the grey strip should approximate to equality, and the screen that gives the most equal results will be the best. The cause of any inequality can be conveniently traced by reference to the effects produced under the four outer or pure colours, an inspection of which will show that part of the spectrum to the rendering of which the error is due. In order to make sure that the exposure has been such that a notable variation would have caused an appreciable difference in the densities produced under the coloured squares, they should be roughly matched on the graduated series of tints, and if the equivalent density here is markedly different from the number on either side of it, and is not too low down on the scale to give a sufficient range, the exposure has been satisfactory. The remarks made on testing the colour sensitiveness of plates are, in general, applicable in this case.

Of course this testing can be done in other ways. The plate under the compound screen, with the colour screen superposed, may be exposed without the use of a lens and camera. The disadvantages of this method are (1) that the exposure is very much more difficult to regulate, and (2) that the colour screen must be large enough to cover the quarter-plate, or, at least, that part of it involved in the test. By the other method the smallest screen that is of any practical value can be tested. Obviously the combinations of the objective might be removed from the mount, but this appears to offer no advantage to compensate for the trouble of so doing. There is no need to exactly focus the white surface; indeed, it would be better to put the sensitive plate in the principal focal plane of the lens, as that would leave the ratio of aperture to focal length uninterfered with and secure more uniform exposures.

If the aim of the photographer is to find screens that will give the greatest difference possible in colour rendering, as is desirable in discriminating between different inks, and detecting invisible stains on paper, as for example, in the investigation of the suspected fraudulent alteration of documents, then the greatest difference will be sought for between the densities produced under one and the other three of the four pure colours. This is so obvious that there is no need to enlarge on the method.

In matching screens to plates for three-colour work, the blue, green, and first red of the pure colour series will give valuable indications. Roughly speaking, the blue screen should give chiefly blue, but with a little green; the green screen, chiefly green, but with a little blue and a little red; and the red screen, chiefly red, but with a little green. The proportionate effects could be measured and so compared with a degree of accuracy, though for this particular purpose the specially balanced colour discs or glasses as arranged by Sir William Abney would, of course, be preferable.

Sundry Other Tests.

The testing of lights is analogous to the testing of colour screens. It is well known that gas and the incandescent electric light are yellow, and, with an isochromatic plate are equivalent to a whiter light, such as daylight, used in conjunction with a yellow screen. The method of testing various sources of illumination is so obvious that it need not be further entered into.

Questions often arise as to the best adjustment of the various constituents of developers to secure the particular effect wanted. For black-and-white work, the greatest contrast possible; for half-tone work when the subject has a long range of luminosities, when, for example, detail has to be simultaneously rendered in snow and dark foliage, then a long flat curve of densities is required. By giving two plates similar exposures, and developing them with the different developers, it will be seen at once in what direction to vary the developer to secure the desired result. By developing a plate until nothing further is getable on it, until the action of the developer is pushed to its very extreme, and then another similarly exposed until the same result so far as detail is concerned is just obtained, noting the time occupied, it is easy to find the time that the given developer requires at the temperature of the experiment to bring out all that can be developed on the given plate. And there is probably no question that can arise in connection with the behaviour of plates, or the effects of variation in their treatment, that cannot be answered by one or two experiments made with this apparatus.

Chapman Jones, F.I.C., F.C.S.

TRICOLOUR TRANSPARENCIES BY THE LUMIERE SYSTEM.

At the present moment, when photography in natural colours has been brought so much to the fore by the interesting Presidential address of Sir William Herschel to the Photographic Convention, it may not be without interest to briefly abstract a lengthy paper by MM. August and Louis Lumière on their process of producing the above. We may state for the benefit of those who are unacquainted with the process adopted by these investigators that it is practically the superposition of stained films.

MM. Lumière have entered most thoroughly into the theoretical consideration involved in the process, and whilst their paper is somewhat too long to translate verbatim, we may point out, as bearing somewhat on a controversy raging at the present time, that they admit that while the use of a panchromatic plate for all three exposures would tend to simplify matters, yet this method has considerable disadvantages. Primarily, that the colour filters pass an extended band of the spectrum, and that if intense or deep filters are used the time of exposure is inordinately prolonged, and that to sensitise one plate for the one set of rays which filters may happen to pass, the action of the others is reduced.

Local sensitising is effected, as is well known, by the addition to the emulsion of certain commercial dyes; but MM. Lumière found these unsatisfactory, and they prepared bromised and iodised tartreines from resorcine and metamidophenol, which correspond to the eosines, erythrosines and rhodamines, in which the phthalic acid is replaced by tartaric, succinic, and other acids.

The plates used therefore, for the obtention of the three negatives are the "ordinary," the yellow and green and the red and orange sensitive manufactured at their factory at Lyons.

The coloured filters which they use are sheets of glass coated with gelatine and then stained, and the particular method which they give of the preparation of these screens is so minute as to enable all to prepare them.

Glass 2 mm. thickness with parallel faces is coated with a 10 per cent. solution of gelatine, 5 c. c. of gelatine solution being allowed for each glass measuring 10 cm. square. The gelatine is allowed to set in a perfectly horizontal position and then dried.

The dyes used are:—

1. New methylene blue N, No. 426 of the table in *Traité de matières colorantes* by Seyewitz & Sisley, $C_{18}H_{22}N_3SnCl$. This is the chlorozincate of diethylparamidocresylthiazine (Casella).

2. Auramine yellow G, $C_{17}H_{22}N_3Cl$, No. 292 of the above mentioned table and is the chlorhydeine of amido-dimethyl-paradiamido-ortho-dicresylmethane (Badische Anilin und Soda Fabrik).

3. Metanil yellow. $C_{18}H_{14}N_3SO_3Na$, No. 29 of the above table, and is phenylamidoazobenzenemetasulphonate of soda (E. Hepp and K. Ahler).

4. Erythrosine. $C_{20}H_6I_4O_5Na_2$, which is tetraiodofluorescine sodium salt (Noelting).

The dyeing baths are:—

Green Bath.

Methylene blue N, solution 0·5 per cent.....	5 c. c.
Auramine G, solution 0·5 per cent.	30 „

Blue Violet Bath.

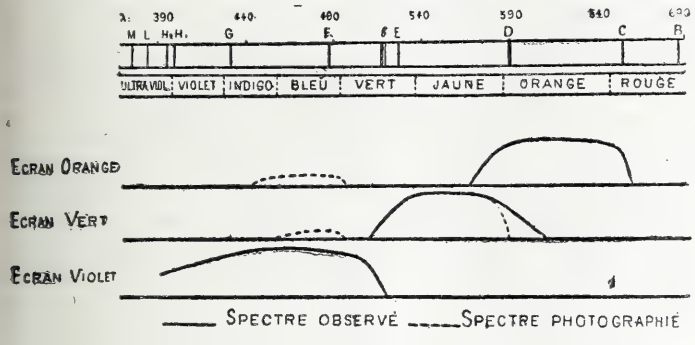
Methylene blue N, solution 0·5 per cent.	20 c. c.
Water	20 „

Orange Bath

Erythrosine solution 0·5 per cent.....	18 c. c.
Metanil yellow sol. sat. at 15°C.....	20 „

These solutions should be filtered and heated to 20°C. and the gelatinised glasses should be immersed in these baths for five minutes and the solutions rocked all the time and then quickly rinsed and put away to dry.

In order to attain the necessary depth of colour and preserve the screens they are cemented together with a viscous solution of Canada balsam in alcohol, and the spectroscopic curves which these screens should give are shown in the accompanying figure.



The orange screen is used with a plate sensitive to red and orange and gives the blue positive film, the green screen is used with a plate sensitive to yellow and green and gives the crimson positive, and the violet screen with an ordinary plate and gives the yellow positive.

Further communications are promised on this subject.

THE ACTION OF LIGHT ON LEATHER FOR BOOK-BINDING.

THE recently published report of the Society of Arts Committee on leather for book-binding contains one or two interesting passages on the effects of light on the leather of bound books. Sir H. Trueman Wood, M.A., who kindly draws our attention to the matter, remarks, "The Committee satisfied themselves, as you will see, that the action of light on some leathers is distinctly injurious. Some leathers are also extremely sensitive to light, and quite a good print can be obtained if a piece of leather is exposed under a strong black and white negative. I have myself verified this by making some prints on some white leather prepared for book-binding purposes. A couple of days' exposure to bright sunlight turns it quite brown, and a visible print can be obtained from a black and white negative by a few days' exposure to diffused light."

The Committee's report states that leathers were exposed under various conditions to gas fumes, to light (sunlight, gaslight, and electric light), and to heat. As the result of these experiments, the Sub-Committee consider that of the deleterious influences to which books are subjected, the fumes of burnt gas are the most fatal. The results of the experiments of exposing leathers to light of various colours were somewhat unexpected. It was found that leathers of a different character act in very different ways—some are bleached or darkened very rapidly by the action of direct sunlight, others resist for a longer period. Most leathers, however, appear to be affected, not only in colour, but in their actual substance.

As regards sunlight, experiments were made by exposing the leathers under differently coloured glasses, and a simple test is proposed for the character of the light most suitable for libraries, as it is found that the action of light upon leather is quite comparable with the action of light upon ordinary photographic printing paper. Glass which is to be used for glazing library windows can therefore be tested by trying its action on such a material as ordinary photographic paper, and it is suggested that all library windows which are exposed to the direct rays of the sun ought to be glazed with glass of a slight yellow or olive tint, so as to exclude as much as possible the more chemically active rays. It was also found that a darkening action was produced by exposure to artificial light, though it is not quite certain how far the effects observed were not partially due to the radiant heat. So far as the Sub-Committee were able to ascertain these effects were not so much due to the effect of oxidation as to the action of light, warmth, and moisture. On the whole, the Sub-Committee are satisfied that of all the influences to which books are exposed in libraries, gas fumes—no doubt because of the sulphuric and sulphurous acid which they contain—are shown to be the most injurious; but light, and especially direct sunlight, and hot air are shown to possess deleterious influences which had scarcely been suspected previously, and the importance of moderate temperature and thorough ventilation of libraries cannot be too much insisted on.

Fuller particulars of the tests referred to are given in the sub-Committee's report which is printed as an appendix:—

Some attempts have been made to determine the effect of light transmitted through glasses of different colours, and they point to the fact that blue and violet glass pass light of nearly as deleterious quality as white glass; while leathers under red, green, and yellow glasses were almost completely protected. These statements are true not only of East Indian tanned skins, but of those tanned with sumach; but the latter were much less affected, even by the blue, white, and violet light, again demonstrating the greater power of resistance of sumach tannage. There can be no doubt that the use, of pale yellow or olive-green glass in library windows exposed to direct sunlight is desirable. A large number of experiments have been made on the tinted "cathedral" glasses of Messrs. Pilkington Bros., Limited, with the result that Nos. 812 and 712 afforded almost complete protection during two months' exposure to sunlight, while Nos. 704 and 804 may be recommended where only very pale shades are permissible.

The glasses employed were subjected to careful spectroscopic examination, and to colour-measurement by the tintometer, but neither were found to give precise indications as to the protective power of the glasses, which is, no doubt, due to the absorption of the violet, and especially of the invisible ultra-violet rays. An easy method of comparing glasses is to expose under them to sunlight the ordinary sensitised albumenised photographic paper. Those glasses under which this is least darkened are also most protective to leather.

Experiments made by exposure to artificial light from both ordinary and incandescent gas burners and from incandescent electric lamp during thirty days show marked darkening, but it may be questioned whether the effects observed were not partially due to the radiant heat, and further investigations are in progress. Attempts made to decide whether the darkening effects observed were due to oxidation, by exposing samples to oxygen, air, and carbon di-oxide, and in a good but not perfect vacuum, proved inconclusive, light, warmth, and moisture having apparently more influence than oxygen.

A NOTE ON THE MANIPULATION OF THE WELLINGTON FILM.

So much has been already written on the subject of the advantages and disadvantages of using films that it is not necessary to go into the matter here beyond saying that every device that tends to make a film more satisfactory is gladly welcomed by that large body of photographers, who would only be too delighted to discard plates for a portion or the whole of their work could they but find a film that really fulfilled their requirements. There can be no two opinions about the advantages of a film of the nature of the Wellington stripping film for enlarged negatives, on account of the ease with which it can be used for silver, carbon, or platinum, printing, while the absence of any risk of breakage is a consideration of great importance in large sizes. For the best work, however, it is no use to have a negative containing creases which the most violent springs will not flatten out in the printing-frame, nor does it tend to good temper if the film insists on curling up directly it is released for half a minute, while the advantage of being unbreakable is dearly bought at the price of the negative being spoilt by being accidentally creased by doubling up or by having a drop of water spilled on it.

The object of this note is to show how all these disadvantages may be overcome with very little troubles. I don't say that it is impossible to avoid creases by following the instructions issued with the Wellington film; but, I do say that very frequently creasing of some sort is found even when the utmost care has been taken. Now this creasing can be entirely avoided if instead of squeegeeing on to a

ferrotype plate, as the makers recommend, the washed films be mounted (paper side down, of course), on very stiff cardboard, in just the same way as a P.O.P. print, and then allowed to dry. When the films are absolutely dry, they can be stripped off without a crease, leaving their paper support still attached to the card. The mounting is as easy as squeegeeing, and as long as the film is allowed to become thoroughly dry before any stripping is attempted, not a crease will be found from corner to corner. Any old piece of very thick card will do, or possibly a well-planed wooden board would prove equally serviceable, and the paper backing could be washed off each time ready for another film. I have not, however, actually tried the latter, and do not know whether the ordinary mountants would make the film adhere properly to wood; but I see no reason why they should not. If there is any fear that the mountant has got much over the edge of the film, a print trimmer may be run round just a sixteenth of an inch from the edge before stripping; but with due care this is unnecessary. I have placed several 10×8 films straight from the washing water on a piece of glass one on top of the other, just like P.O.P. prints, and after they were mounted and had got thoroughly dry, I have found no difficulty in stripping them without any cutting. Not only does this method prevent creases, but the films so treated will show little or no tendency to curl, and if stored under slight pressure will always lie flat in the printing-frame.

Having described the way to avoid the first two of the three disadvantages mentioned above, let us now consider the third, viz., what to do with a stripped film that has been accidentally creased. Obtain a piece of glass a size larger than the film, for instance a 10×8 for a ¼ plate film, 12×10 for a 10×8 film, &c., and place it in a deep dish about half full of cold water. Take the creased film, and also put it in the water, and wait till it gets limp; then bring it in contact with the glass, and raise both together gently out of the water, keeping the film as near as possible in the centre. The film is so tough that this is easier than it sounds. When the excess of water has drained off examine the reverse side of the glass to see that no air bells have got in between the film and the glass. If they have, return to the water and lift out as before. When the film is satisfactorily arranged on the glass, allow to drain for a short time, blot off the edges, and remove any superfluous moisture, then take a brushful of Page's fish glue, and gently lifting one corner of the film insert the brush for about a quarter of an inch and run it down one side between the film and the glass, repeat this on the other three sides, and set the plate up to dry. When quite dry, lift one corner with a sharp knife, when the film may be peeled off without a crease and perfectly flat. The use of the glue is necessary to prevent the film peeling off as it dries, and so becoming worse than it was originally. When I first tried this dodge, I feared the film would expand greatly and so alter the densities, but I found the increase was trifling, being only about a quarter of an inch each way in the 10×8 size with which I was experimenting. It is best to place the matt surface of the film next the glass, as the after stripping is then easier. I may add that as little glue as possible should be used for fastening the edges, and that it should be inserted evenly all round.

To sum up:—First, there is no need to get creases at all, except by accident, if the films are in the first place mounted on a stiff support instead of being squeegeed. This is no more trouble, and does away with a ferrotype plate altogether. Second, if a film does not happen to get creased it can be quickly made once more even and flat by imposing it on glass, and sticking the edges so that it cannot move till peeled off. The great point about both the manipulations I have described is that the film should not be stripped too soon, and unless it is wanted in a special hurry it is better in both cases to leave it attached to its support for at least twenty-four hours before stripping. CLAUDE RIPPON, M.A.

THE CAMERA AND HOLIDAYING.

[By A PHOTOGRAPHIC IDLER.]

DOES the camera add to the pleasure of a holiday? The question is worth discussing, now that we are in the midst of the holiday season, and as every one is naturally anxious to get as much pleasure as possible out of his holidays. The enthusiast would immediately answer the question in the prompt and emphatic affirmative. As applying to enthusiasts like himself, the answer is undoubtedly the correct one, and should be acted upon. But it must be remembered that the majority are not enthusiasts, and it is to these that we would more particularly state our views and experience, for what they may be worth. Most of its followers like photography very well, but are not going to photograph at the expense of comfort. A very wise view, and if carrying a camera will have the effect of detracting in any way from the broader good effects expected from the holiday, it should certainly be left at home. Beyond the frame of mind much depends upon the length of the holiday. If it be a long one, and taken alone, it would be best perhaps to take the camera along in any case, and determine whether it be used or not after the first week or fortnight has been spent. The brightness of anticipation will by that time probably have become somewhat dulled. The perfect rest and lounging about in flannels, which as a harassed and hard-working commercial or professional man he may have looked forward to with such longing and gusto as a contrast to his every-day life, do not by any means fill up to contentment point after their first pleasant edge has got worn down. The camera might now be of great service in filling up time and mind gaps. But very few by comparison can count upon a month's holiday. A fortnight is nearer the mark. To these, if of the same ordinary commonplace make as the writer, the advice is given, not to take a camera, either hand or stand. The advice is based upon personal experience, and that of friends, together with a judging of the results of holiday work.

It is very pleasant in the abstract to think of gaining a pictorial record of a pleasant holiday, that, made up into a little hand-book, would serve in winter months to jog up pleasant remembrances of summer pleasures, or show to a friend when dilating upon them. The only drawback is, that in the concrete the little book is so very rarely seen, and if seen, is not regarded as having come up by any means to expectations. If a man were to set about such a matter in all earnestness, and as hard work, he would find it very difficult to carry it out satisfactorily. It is hardly likely that he is going to succeed when in holiday mood. The same applies to the individual picture. If worth anything it must have meant thought and work. A holiday means exactly the opposite. Being diametrically opposed, they cannot be both carried out properly at the same time. It is hard enough to bring down two birds with one stone when in a line, but if not in a line it comes pretty near to an impossibility. Oh! but we don't mean pictures in this complete sense, but merely something to serve as reminders. All very well until the reminders are being developed, when it is borne in clearly enough that it was pictures we really meant after all. We are not going to say that it is not possible to gain an occasional good thing as a snap-shot taken in a hurry. But we also state with emphasis, that for one good thing thus gained by a mixture of good judgment, favourable light, and lucky composition, fifty are gained that are very far indeed from being good. It makes no difference to the camera that the one who carries it is out for a holiday. It exacts the same rigid and minute compliance with its demands before success can be gained, as it does in the case of a professional worker taking a factory front. If the sun is not in the right place in the morning for his purpose of snap-shotting the fishing boat hoisting its brown sail as it gently drifts towards the harbour bar he will do no good. He must come back again in the evening. But in the evening he is on the pierhead listening to the band. Which is it to be, band or boat? It is this conflict of object that stands to reduce the pleasure of the holiday. The photographic possibility is always suggesting itself, and keeping the strings of attention tense, when to get the full benefit of the change they should hang loose. That is, if the possibility of action in the presence of the camera be present. Otherwise, merely as a lazy sub-conscious composing of imaginary pictures, the photographer with a dash of the artistic in him has a great advantage in the added pleasure over his fellow holiday-maker who knows nothing of photography. If some attendant sprite could carry the camera, and be ready to hand it to its master at a beck when he thought he had reached the psychological moment, it would not be so bad. But this is, of course, out of the question, and the camera must be carried by himself. It is astonishing what a nuisance even a small hand-camera can become in a day's outing if the object with which it was taken was merely the hope of catching something. Full physical freedom is lost, and when the other members of the party are free to swing their sticks, climb rocks, and jump across the brooks, he, with the camera in hand or

slung across the back, must move more gently and warily. If anybody feels disposed to doubt it, the proof is easy. Let him take a camera with him to a picnic. And far more important, mental freedom is also lost, for he is eternally on the look out for a photographic scrap to justify his burden. This can hardly be called enjoying a holiday, even though the pictures turn out successes. It is still less enjoyment if they prove failures, which they most likely will, taken under such circumstances.

Holiday pictures do not, as a rule, lend themselves to the camera. Perhaps they are more impressions than pictures. Take a man at the seaside, for instance. It is not the breaking wave photographable in the small angle of the beach that appeals to his fancy, and makes him feel certain that he is enjoying himself, but the full airy breadth of the sea, the long stretch of sandy or rocky coast, clear-cut in brilliant sunshine close at hand, lost in faint horizon haze ten miles off on each side. Further, the whole is a contrast to his usual hemmed-in surroundings. When for a whole year, bar a fortnight, desk and ledger have formed the elements of a foreground, a blank wall the middle distance, and the further distance has to be filled in from imagination, small wonder that the ample breadth of the open face of Nature should be agreeable during a holiday. We do not say that these broader features cannot be expressed by suggestion in a photographic picture. They have been. But not by the ordinary every-day photographer. It is work for men very much in earnest upon conveying a definite impression, which they have been at great pains to reduce to technical practicability, and patiently waiting the favourable opportunity for action, loth to present itself. We need not confine ourselves to the seaside for an illustration. The same qualities please the soul, and handicap the camera, on the moor, the "broad," and the lake, or amongst the mountains. As a rule, too, they are at their best in the twilight when photographic possibilities are at their lowest.

Even though it were possible to photograph a pleasing picture with a fair amount of success, it is doubtful whether upon the highest considerations it would be advisable to do so. There are some pictures better left with the hazy glamour that the imagination has softened them down with, than expressed in any clearer way. The hum of bees, the scent of honeysuckle, the glow of gorse, the springy couching of heather, and the sunset glow of colour in the west, cannot be put into any photograph. Pictures such as these are not album pictures. They are never medalled. But there is never any question as to whether they are the best, nor as to their value in lightening up life. Most possess a few; happy they who possess many. Holiday time is the most favourable time for their acquisition—in our opinion, with body and mind free from the grosser burden of a camera, for the attempt at a commonplace picturing of that portion which can be done may spoil the perfect ease and rest absolutely necessary for the reception upon the tissue of the soul of the fuller and finer-grained picture as a whole. There is no disrespect to the camera we hasten to add, but the reverse. Still, it is not the highest consideration in life, and the best is far more likely to be got out of it confined to its own true ground, than if introduced with well-intentioned but mistaken purpose, into time, place, and mood, ill-adapted to its use.

WAYFARING EXPERIENCES.

The other day I was in a very interesting district. It does not matter where, but it is a fine field for the roaming photographer. In getting there a fairly long railway journey is involved, and on such occasions one is very likely to hear some photographic chat. I am always ready to hear of other people's experiences, though I find that, as a rule, if one offers help, out of one's own experience, it is very charily received. The fact is the dashing snapper photographer, who does not "do the rest," does not care for experience at all. What he gets he gets, and not always that as he would have it. The summer time finds this class of camera-holder more or less in evidence. As a rule, he is harmless, though he is often thoughtless, or rather unthinking.

I had been wandering about this old place, a spot full of memories dating from Roman days and full of echoes of the busy times of Elizabeth, but now, perhaps, in the eyes of many, but an "interesting" seaside town. I had dropped upon the Secretary of the local photographic society, and found him to be an obliging man, who was ready to help with suggestions as to subjects of a varied character, and in any way that might enable one to get at the "tit-bits" of the district. Being also a dealer, he had a fund of story to draw on. One of his most laughable experiences, though, of course, the laughter was between ourselves, was a case like this. A tradesman of the town thought he would like to take up photography, but, being a person of a keenly economical turn, he was prepared to go carefully. Could he get some photographs with a certain camera—a hand variety costing under 7s. 6d.? He went closely into the pros and cons. of the matter, bought the outfit, and went his way. Some little time elapsed, and then one day the avalanche came. "I thought you told me I could get photographs with that camera you sold me. I call it a confounded swindle, a—— a——." A deprecatory gesture from the dealer, who had some one to attend to, stilled the thunder for a moment, though there were deep and continued rumblings. At last the dealer was free, and the photographer's wrath broke out afresh. "A swindle, I call it—a dead swindle. Look here, where are the photographs?" and he tumbled out the plates all of a heap upon the counter, just to all appearance as he had bought them. But even then the reason of the uproar was not evident. "Well, what is the matter," said the dealer. "Matter enough, where are the photographs?" continued the camera man. "I used the camera as you said, and when I had done the lot, I took out the plates, but there were no photographs there." Whew! But the dealer did not answer in kind, and he bottled up the laughter he felt. Then he explained, and the careful man had not complained since.

Another sweet thing was a case of a seeking photographer, who, to be safe, got all his solutions made up, read up his instructions, and, wanting to learn the whole business himself, proceeded to develop. He had half a dozen plates to deal with; his bottles were all arranged in due order, and he started. The first plate was put into the dish and carefully rocked. Now and again it was looked at, but no image came, and soon there was clear glass. He thought it was odd, but he tried them all, thinking each would be better than the preceding, but they were all blanks. Then he went—very warm, very fiery indeed in language unexpressed—into the outer light, carrying with him his two bottles—one-solution developer, fixer. He had put them on his shelf so as to feel them in the dark, so: 1 developer, 2 fixer; but the fates had ordered otherwise; by some mischance 2 was 1, and 1 was 2, and there he was. He did better afterwards.

Out in the street near by was a very delightful study of old houses, only to be done justice to by certain lighting. It was curious to hear that these travelling kodakers always think such things can be snapped, and snapped they are; even on a winter's day, as the district is one popular even in winter. Said one at the moment, "What are you giving?" to a man with a stand. "A second." He was using a fairly big stop and a quick plate, but the subject called for this. The first man said, "I am working at 22, and I think 1-20th of a second will do." Perhaps it did, but unless a special providence was watching, it was a hopeless case. Beside which, as he tilted his camera to "get it in" (then, I fear, he did not), and the shade of Charles I., who is credited with having held a Court here, would surely see but a drunken ghost of a thing if he ever came across the negative.

Ira Romer.

A KODAK EXHIBITION.

The Kodak Company could hardly choose a more efficient or a more legitimate method of advertising than the one which they have adopted in the present and in some former instances, in holding a free exhibition of results that have been obtained with their apparatus and materials. The exhibition we have now under review, which will be open to all who choose to visit it until October 31, is held in the company's new gallery at 40, West Strand, W.C., and in justice we should first say a few words concerning the premises themselves.

An alteration in a shop front in London generally means the creation of an obstruction which is also an eyesore. The obstruction, perhaps, cannot be avoided, but the inconvenience is not made less tolerable by using the necessary hoarding for more or less gaudy advertisements of pill-makers, soap manufacturers, and entertainment mongers. In this respect the Kodak Company set an example, which, in the common interests of those whose business is promoted by making London a show-place as well as a centre of commerce, should be widely followed. During the reconstruction of the premises the hoarding was there—it could not be dispensed with; but, instead of being chopped up into spaces containing appeals to the dyspeptic and the unwashed, the whole was treated as a series of decorative panels.

The advertisement was not absent, but it was so skilfully disguised that the ordinary passer-by would retain the word Kodak in memory, though forgetful of what had given rise to the impression upon his mind.

To make such an opportunity indicates no mean amount of talent. The same talent—that of George Walton—has been brought to bear upon the interior decorations of the premises. We have come away, after the hour or so we spent there, not with any recollection of patterns or designs, but with a pleasing impression of exquisite woodwork, graceful mouldings, and dainty stencillings, in fact of George Walton at his best, unmarred by the extravagances and the barbaric crudity that he occasionally indulges in. The place is well worthy of a visit apart from the objects of photographic interest that there are on view.

The exhibition of Kodak war pictures follows closely the lines of the exhibition held by the Kodak Company a few months ago at their Brompton branch. Most of the photographs shown there are here; but there are also about 100 similar subjects that have not been exhibited before. The whole affords ample testimony, if any be needed, of the practicability of the Kodak as a photographic instrument under circumstances which have obviously been sometimes of the most difficult kind. The pictures exhibited are enlargements, many of them of considerable size, on royal bromide paper, toned, and as much credit is due to the skill and good taste displayed in making the enlargements as to the production of the original photograph.

A portion of the exhibition is devoted to a collection of photographs illustrating the kind of work that the Panoram Kodak is capable of, and these examples undoubtedly prove the usefulness of such an instrument when employed upon suitable subjects, and with a due amount of skill and discretion. There are also portrait enlargements from negatives made with the Kodak portrait attachment, used with Kodaks of various types. Several of these have some pretensions to pictorial merit. A room, which we believe is to be devoted to the purpose of a demonstration laboratory, contains a very interesting collection of technical exhibits, showing the results that can be obtained upon Kodak materials under different methods of treatment.

The catalogue is well got up, and is illustrated with half-tone reproductions of photographs taken with the Panoram.

THE "TEB" CHRISTMAS CARD COMPETITIONS.

Messrs. Chas. Tyler and England Bros., of 79, Copenhagen-road, King's-cross, N., announce that, with a view to popularising their "Teb" series of Christmas photographic mounting cards, they have organized a competition, and are offering 250 money prizes amounting to a total of £317 6s., for the best photographs sent in. The competition is divided into two sections—professional and amateur. The judges in the former section will be Messrs. Thomas Bedding and H. Walter Barnett, President and Vice-President of the Professional Photographers' Association, and those in the latter section will be Messrs. J. Craig Annan, A. C. Brookes, and A. Horsley Hinton. The prizes will be given for prints from negatives of various sizes, from Little Nipper and Brownie to half-plate. The rules and conditions of the competition are:—

The "Teb" Photo Christmas Card Competition is free to all photographers. Prints by any process may be submitted, and of any subject. Preference will, however, be given to portrait, figure, or genre subjects in the professional class, and to landscape, still-life, flowers, and general snap-shot subjects in the amateur class.

All prints must be mounted on or in "Teb" photo Christmas cards, which may be obtained of all photographic dealers, and all inquiries relating to the competition must be made through a dealer.

A coupon will be found in each box of mounts, which must be filled in and forwarded with each print. If the mount is of the paste-on type the coupon must be pasted on the back of the mount; if a slip-in mount is used the coupon must be attached to the back of the print and inserted together in the mount.

Any number of prints can be submitted by any competitor, but each print must bear a coupon. Competitors cannot obtain more than one prize for one-size print, but may compete for prizes under each size print.

All prints sent in become the property of Messrs. Chas. Tyler and England Bros., Ltd., together with the right to reproduce them, and Messrs. Chas. Tyler and England Bros., Limited, cannot undertake to return prints to any competitor.

Prints must be received by Chas. Tyler and England Bros., Ltd., 79, Copenhagen-street, King's-cross, London, N., not later than November 30, 1901, and must be marked on the wrapper with the words "Teb Christmas Card Competition."

The results of the competition will be published on December 20, 1901, in the "Daily Mail" and in the photographic journals.

Our Editorial Table.

We have had an opportunity of viewing an exceptionally fine studio camera, constructed for plates up to 24 inches, which Messrs. W. Watson and Sons, of 313, High Holborn, have just built for a photographer in the North of England. The camera is mounted on the identical stand which was exhibited by Messrs. Watson and Sons at the Crystal Palace Exhibition of 1898, and which formed one of the most imposing features of their exhibit. When we mention the fact that the legs are carved out of 12 inch logs of mahogany, the solidity of the whole may be imagined. The camera is built to the same design as Watson's new combination studio cameras, and has every adjustment that can possibly be required. It allows something over six feet extension, and fittings are provided to the back to take plates of all sizes down to half-plates. The camera is fitted with a Ross symmetric anastigmat lens working at f-5.6. The outfit has been got up regardless of cost, and we need hardly say that both material and workmanship are magnificent.

The Goerz-Anschutz Camera, &c.

From the firm of C. P. Goerz, of Berlin, whose London address is 4 and 5, Holborn-circus, E.C., we have received a descriptive catalogue, principally devoted to the Goerz-Anschutz folding camera. The catalogue itself is very daintily printed in colours, and is copiously illustrated with half-tone photographs from negatives taken with the camera. The cover of the catalogue deserves notice on account of its striking and unusual character. It is evidently a half-tone photograph from a clay model which must have been designed and executed especially for the purpose. The Goerz-Anschutz camera is very fully and lucidly described, together with full directions for its manipulation, and other matters of importance to those who wish to excel in hand-camera work. Other products of the firm, such as the various series of the well-known Goerz double anastigmatic lens, the Goerz sector shutter, the Goerz photo-stereo binocular, the Goerz-Trieder binocular field glasses, &c., are also described, and the prices given.

The Barnet Book of Photography. Fifth edition.

Elliot and Sons, Ltd., Barnet.

That the fifth edition of this work is already demanded is a more direct testimony to its utility than anything we could say on the subject. The present edition differs only in detail from the former one. It consists of a number of articles upon specific subjects connected with photographic art and science contributed by some of our best recognised authorities and others. The series includes Alpine Photographs, by Sir W. de W. Abney; Negative-making, by C. H. Bothamley, F.C.S.; Lenses, by Chapman Jones, F.C.S.; Portraiture, by Harold Baker; Pictorial Photography and Platinotype Printing, by A. Horsley Hinton; Architectural Photography, by J. H. Avery; the Hand-camera, by W. Thomas; Lantern Slides, by A. Pringle; Enlargements, by J. A. Hodges; P.O.P., by the Rev. F. C. Lambert; Contact Printing on Bromide Paper, by W. Ethelbert Henry; and Carbon Printing, by J. Skelton, as well as several pages of useful formulæ and other information. All the articles have been revised by their authors, and brought up to date. In addition to cuts in the letterpress, the work is illustrated by twelve full-page half-tone blocks from original negatives, and a frontispiece printed in carbon. The book does not, and is not intended, to supersede the ordinary text-book of photography, but to the photographer who has passed the beginner's stage it provides precisely the kind of information that is necessary to enable him to improve his work technically and pictorially. The book is admirably printed, and neatly bound in cloth. It is certainly one of the best shillingsworths of photographic literature we have met with.

Practical Notes on Tele-photography, by Messrs. R. and J. Beck, 68, Cornhill, E.C., has reached a second edition. It contains a specimen illustration showing the capabilities of tele-photography in high-power work. A portion of a view taken with a 9½ in. lens was photographed with the same lens, with the addition of a tele-photo attachment, a magnification of 20 diameters being obtained. Definition in the latter case appears excellent, and the photographs are certainly striking examples of what may be achieved by high-power tele-photography. A useful chapter on the possibilities of instantaneous tele-photography has been added to the book, which has been revised in parts.

News and Notes.

We are asked to state that the small fire which occurred at Mr. Mallandain's office in Cheapside on the 18th inst. will not delay the execution of the orders for his "V.B." self-toning paper. The paper is sensitised and stored at his electric works in Aldersgate-street.

At the Woodbury Gallery, 37, New Bond-street, W., there is now on view a selection of carbon reproductions from pictures in our national collections and elsewhere. The entire catalogue of these reproductions, which the Woodburytype Co. publish in various sizes, runs into about thirteen hundred subjects. In addition, there is at present in the gallery a collection of Chinese curios from the Pekin Palace, and also a number of original drawings by various artists which have, in most cases, been reproduced in the "Sphere."

Photo-micrography and Microscope Tubes.—Those of our readers interested in this branch of photography should read two papers by Mr. Nelson, published in the "Journal" of the Royal Microscopical Society for last month, and the month before, on tube length and working aperture. There are many unsettled points yet to be determined in regard to the microscope—it was only quite recently that the Abbé theory of images was utterly impugned—and Mr. Nelson explains the peculiarities of tubes and their lengths, of which, he states, there are three—the mechanical tube, the natural optical tube-length, and the conventional optical tube-length, all matters which should be quite familiar to those desiring the best effects in photo-micrographic operations.

Austrian Reverence for the Dead.—A piece of vandalism is recorded in the "Neue Freie Press," of Vienna, which only wants the added horror of "photographic presentment," which we may expect in due course to fill the tale of horror. It was recently the 300th anniversary of the great astronomer Tycho Brahe's death, and the Prague Town Council celebrated it, not by religious requiem, but by exhuming his bones and taking them out of the coffin. We trust that no photographs of such gruesome relics will be shown in this country, and we would commend to the Prague Town Council the lines attributed to Shakespeare himself, which are engraved on a slab near the spot where he was buried:—

"Good friend, for Jesus' sake, forbeare
To digg the dust encloased heare;
Bleste be the man that spares these stones,
And curst be he that moves my bones."

Calcium Carbide.—A contemporary states that the trade in calcium carbide is passing through a severe crisis in all Europe, particularly in Austria, where its preparation is greater than in Germany, Switzerland, Italy, and Scandinavia, the only other countries in which it is carried on. The crisis is caused by over-production, which has induced such a slump in prices that all the works in the countries mentioned have been obliged to cease operations. Last year the production of calcium carbide amounted to about 50,000 tons, whereas the consumption for the manufacture of acetylene was only some 12,000 to 13,000 tons. Consequently the supply was more than four times as great as the demand. This was accompanied by a constant fall of price, so that whereas a year ago calcium carbide cost 30s., just recently it was only 21s. 6d. A year ago calcium carbide cost just three times as much as it does now. In order to restore the trade to health, the works in Austria, Germany, Switzerland, Scandinavia, and Italy have arranged for an entire stoppage of production. This stoppage is likely to last several years, as the demand was scarcely a quarter of the supply.

Exhibition of Historical and Architectural Photographs.—The Board of Education has organized an exhibition intended to show how great is the service which photography may render as an aid in recording events or in preserving the aspect of things as they were. In the collection of some 600 photographs now on exhibition in the galleries of the Indian Section of the South Kensington Museum, old British houses and county halls are well represented, and the treatment of Astley Hall is typical, two external views and two interiors being shown. The interiors in this particular case have, perhaps, the greater interest; one shows the "Long Gallery," with its old panelling, low ceiling, quarried windows, and carved furniture, while the other shows the curious and almost gigantic carved bedstead. Contemporary political life is represented by many groups photographed by Sir Benjamin Stone on the Terrace of the House of Commons, each group being dated, and the names being attached; moreover, many of the quainter ceremonies of the Houses of Parliament are illustrated. For example, we find a photograph of the Guy Fawkes search-party as it was ready for duty on February 14 last. Sir Benjamin Stone is a keen student of village customs and ceremonies, many of which are so intimately associated with the history of our country, and as an illustration of this feature may be mentioned the series which shows the "Dressing of the Wells with Flowers" at Tissington in Derbyshire. Remote or distant objects of engineering and technical interest are by no means neglected, and as an example of this section may be mentioned the Ballybunnion single-line railway, photographed in 1899. The riches of our Record Office have been brought to the sight of many by Sir Benjamin Stone's camera, and legible as regards almost every letter, seal, and signature, we see a reproduction of the Bull of Pope Clement VII. confirming Henry VIII. in the title of Defender of the Faith. Windsor Castle, St. Margaret's Church, Westminster, and many other places contribute much which adds interest. The exhibition is open to the public, without charge, every day—on Mondays, Tuesdays, and Saturdays from 10 till 10; on Wednesdays, Thursdays, and Friday, from 10 till 6; and on Sundays from 2 till dusk.

The annual fête of the employés of Messrs. Burroughs Wellcome and Co. took place at the Wellcome Club and Institute, Dartford, on Saturday, July 20, 1901. The programme included athletic sports, aquatic sports, luncheon, maypole dance, tea, dinner, al fresco concert, gymnastic display, distribution of prizes by Mrs. Wellcome, and dancing. A portion of Mr. Wellcome's Egyptian and Soudanese collection was on view in the library, gymnasium, staff club-house, &c., and on the sports ground, and a photographic exhibition, arranged by the Wellcome Photographic Club, was open throughout the day in the club house for gentlemen employés. The Wellcome Club and Institute was founded by Mr. Henry S. Wellcome for the benefit of all the employés of the firm of Burroughs Wellcome and Co. It was opened for their use on June 24, 1899. The premises consist of an old manor house (with extensive grounds), together with other buildings, which provide libraries, reading rooms, assembly rooms, a gymnasium, &c. The objects of the club are —to promote harmony and happy social intercourse amongst the employés and to supply them with a pleasant resort outside of business hours—to encourage mental and physical recreation by means of music, literary and other entertainments, technical and other instruction classes, with occasional lectures, and athletics, field sports and games. Last Saturday's function was a thorough success, and amply proved that Mr. Wellcome's laudable objects had been attained.—At the dinner, in proposing the toast of the prosperity of Burroughs Wellcome and Co., Mr. J. Passmore Edwards said that they not only import science into their works, but they appear to have a motto that all work and no play makes Jack a dull boy, and they had provided here an institution for the recreation of their people. We had heard recently a great deal about political economy, but the truest and the highest political economy is to consider the care and the culture of the individual. If the individual is not protected, if the individual is not educated, if the individual is not strengthened, the Empire itself will not be strong. Continuing, Mr. Edwards said: "I have spoken of science being imported into the industry of this place; I have spoken of recreation; but there is another reason why I should propose this toast, that is that Mr. Wellcome is a jolly good fellow. I have known him in other connections, and I have always found him equal to himself; he always carries a high standard. If you want to know a man, go amongst his family, his friends, his home. We knew of Mr. Wellcome in London, but we did not know of Mr. Wellcome in Dartford. Now some of us know him in London and in Dartford, and we beg to congratulate him on his success all round. I have great pleasure in proposing this toast of health and prosperity to this firm."

The Application of Science to Industry.—In the course of a recently delivered lecture on the Aims of the National Physical Laboratory, Professor R. T. Glazebrook selected the story of the Jena glass works by way of illustrating his remarks on the solution of industrial problems by science. An exhibition of scientific apparatus took place in London in 1876. Among the visitors to this was Professor Abbé, of Jena, and in a report he wrote on the optical apparatus he called attention to the need for progress in the art of glass-making if the microscope were to advance, and to the necessity for obtaining glasses having a different relation between dispersion and refractive index than that found in the material at the disposal of opticians. Stokes and Harcourt had already made attempts in this direction, but with no marked success. In 1881, Abbé and Schott, at Jena, started their work. Their undertaking, they write five years later in the first catalogue of their factory, arose out of a scientific investigation into the connection between the optical properties of solid amorphous fluxes and their chemical constitution. When they began their work some six elements only entered into the composition of glass. By 1888 it had been found possible to combine with these, in quantities up to about 10 per cent., twenty-eight different elements, and the effect of each of these on the refractive index and dispersion had been measured. Thus, for example, the investigators found that by the addition of boron the ratio of the length of the blue end of the spectrum to that of the red was increased; the addition of fluorine or sodium produced the opposite result. Now, in an ordinary achromatic lens of crown and flint, if the total dispersion for the two be the same, then for the flint glass the dispersion of the blue end is greater, that of the red less than for the crown; thus the image is not white, a secondary spectrum is the result. Abbé showed, as Stokes and Harcourt had shown earlier, that by combining a large proportion of boron with the flint its dispersion was made more nearly the same as that of the crown, while by replacing the silicates in the crown glass by phosphates a still better result was obtained, and by the use of three glasses three lines of the spectrum could be combined; the spectrum outstanding was a tertiary one, and much less marked than that due to the orignal crown and flint glass. The modern microscope became possible. The conditions to be satisfied in a photographic lens differ from those required for a microscope. Von Seidel had shown that with the ordinary flint and crown glasses the conditions for achromatism and for flatness of field cannot be simultaneously satisfied. To do this we need a glass of high refractive index and low dispersive power, or vice versâ; in ordinary glasses these two properties rise and fall together. By intro-

ducing barium into the crown glass a change is produced in this respect. For barium crown the refractive index is greater and the dispersive power less than for soft crown. With two such glasses, then, the field can be achromatic and flat. The wonderful results obtained by Dallmeyer and Ross in this country, by Zeiss and Steinheil in Germany, are due to the use of these new glasses. They have also been applied with marked success to the manufacture of the object glasses of large telescopes.

JOSEPH WILSON SWAN.—When a chemist's apprentice teaches his master how to make the best of a hogshead of sugar which he has received damaged with sea water, and then carries out the practical operations of salvage to a successful conclusion, writes Mr. Barnard S. Procter in the "Pharmaceutical Journal," much may be expected of him. It may not be in pharmacy, but in practical work and original work. The lad who passes examinations, takes prizes, and is regarded as a smart fellow, may in after life turn out a professor or a booby; but he who thinks and works on unlaid lines is much more likely to be a light to his country and his generation. As an indication of Swan's versatility, we find him as a young man wearing a pair of boots of his own making, though he served no apprenticeship to the leather trade, but was only moved by the indomitable desire to do, and show that he could do, of his own skill and resource, such things as are usually done only by those who have had a schooling in their art. His disposition was always to seek the best possible way of performing the work in hand, his desire was to discover new ways, or improve old methods. So much was this the habit of his thought that he was often subjected to friendly chaff in his own family for his propensity to improve or discover. One fine summer morning as I joined their family circle they were admiring a beautiful narcissus, and while "Joe" (as he was always familiarly called) was making some comments on it, one of his sisters exclaimed, in a tone of indignation, "Oh, Joe! are you going to improve that?" On another occasion, when a cloth brush and the mode of using it were under comment, J.P. exclaimed, "A discovery! Joe has discovered that his clothes look better after they are brushed!" At another time as I entered their place of business in the evening, the governor accosted me with the remark, "Here is Joe; he has been looking at these two ends of copper wire all day long. He cannot see anything, or hear anything, or think of anything else, and nobody knows what is passing in his mind." In this instance there was a mutual enthusiasm between employer and employed, and while a commonplace man would have got out of patience with an assistant who could spend a day of apparent inertia and no results to show, the genius of the younger man was so well known, and so much appreciated by his employer, who continually profited by his assistant's ingenuity and enthusiasm—it mattered not whether the desired problem was an improved method of packeting Epsom salt, of bottling hair oil, or a new means of obtaining an immense, almost incalculable pressure by alternate small flows of hot and cold water, his ingenuity was ready for the task provided the idea showed novelty and a promise of practical utility—so his fit of abstraction was regarded as a natural element in the course of events. His idea must have been the natural course of development, and one of the developments which took place in natural course was that the assistant became partner, and eventually the principal, in the business. So it was hard thinking had to do the work of his life, and, like many other great thinkers, he got the reputation of absence of mind—a condition more correctly defined as an intense pre-occupation. The current of thought was not to be diverted by any external influences till its goal had been reached. In those days he was not a fluent speaker, and would often wait and keep his audience waiting an apparently unreasonable length of time, rather than use a word which he felt did not fully convey the meaning he intended. This intensity of purpose gives so great a power of success in the accomplishment of any work to which it may be devoted, that every man endowed with this characteristic becomes a study of great interest to those who have the privilege of friendship. During the life of Mr. Swan's late partner, Mr. John Mawson, Mr. Swan apparently took little active part in the financial side of their business, and when by a melancholy accident Mr. Mawson was suddenly removed, many friends wondered how Mr. Swan would manage after the loss of his friend and financial guide. But when it became necessary to turn his mental energy to finance as well as to philosophy, Mr. Swan was equal to the occasion, with apparently no loss of power on the scientific side of his pursuits. He remained the mainspring of two or three retail pharmacies, of a photographic and philosophical instrument business, of a photo dry plate works, of an extensive trade in Dutch yeast, of four establishments for stationery, fine arts, and bookselling, besides carrying through the great works for which his name will be long remembered in developing the incandescent electric light, and the art of photographic engraving, still keeping his connection with the alkali manufacture and the spelter mines, besides some other matters in which artistic taste, scientific attainments, or business energy found scope for useful work, and with all this he can fill the high places in societies of electrical engineering and chemical industry. But science and finance did not kill the humanity in the man. When the contest between Edison and Swan v. the Brush Company was going on in the Chancery Court, and Mr. Swan might be expected to be filled with the spirit of contest rather than that of geniality, a member of the audience exclaimed, "Is that Swan? What a grand head for old Father Christmas!" Mr. Swan's presidency at the meeting of the Society of Chemical Industry in Glasgow should give additional interest in the gathering to all who have any connection with the sciences of electrical engineering, photography, or pharmacy.

Commercial & Legal Intelligence.

TAYLOR, Taylor, & Hobson, Ltd.—This company has been registered by Messrs. Millington and Drew, of 14, Great Winchester-street, E.C., with a capital of £20,000 in £1 shares. The objects of the company are to carry on the business of manufacturers and dealers in scientific instruments, photographic and other lenses, and all apparatus of an optical or scientific nature, and to take over the business now carried on in Stoughton-street, Leicester, and 18, Berners-street, London, as Taylor, Taylor, and Hobson. No initial public issue.

A SHARP-featured well-dressed woman, giving the name of Allie Amie, aged 27, was placed in the dock at the Clerkenwell Sessions to receive sentence on a charge of having attempted to obtain by means of false pretences, the sum of 10s. 6d. from George Newnes, Ltd., by means of a photographic competition, particulars of which have already appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY.—The police stated that she was a very clever swindler, and commenced her criminal career with a sentence of three months' imprisonment at Bristol. Since then she had served a number of terms of imprisonment and penal servitude. —She was now sentenced to 18 months' hard labour.

RE Alfred Thomas, Photographer, 27, Willow-road, Oswestry.—The public examination of this debtor took place at the Wrexham Bankruptcy Court, before the Registrar. The statement of affairs showed liabilities amounting to £107, and the deficiency amounted to £75.—Debtor alleged his failure to have been caused through pressure by creditors, and loss through the erection of a studio, and delay caused in delaying with the by-laws of the Oswestry Corporation. He stated that he commenced busines sat 39, Castle-street, in May, 1900, without any capital of his own, and in September last he removed to 27, Willow-street, the rent of which was £30 per annum. He became aware of his insolvent position in May last, when his creditors commenced suing him. —The Debtor was allowed to pass his examination.

AT the Redruth County Court, on Thursday last, Messrs Major and Darker, photographers, of Camborne, sued Mrs. Channon, to recover the sum of £1 6s., for a portrait in oils and six photos of her late husband. A son of Mr. Major stated that the portrait was enlarged from a photo supplied by Mrs. Channon, and taken some years ago.—The defence was that the portrait was not like the late Mr. Channon in the least.—Mrs. Channon said that when she complained about the portrait, plaintiff said, "Let it stop a little while; people have been known to recognise portraits after a bit."—His Honour: Time will mellow it. (Laughter.)—Defendant said her husband's hair was nearly white, but in the photo it was made to represent a young man of 30.—His Honour: This is a surprising case. People generally like their photos to make them look younger and more beautiful. However, it was not a question of artistic merit, but whether the photo was like the deceased gentleman, and as the evidence was to the effect that it was not like him, there would be judgment for the defendant.

THE Forged Order Case.—At the Mansion House Police Court on the July 18, William Kendrick, aged 49, and Frederick Williams, alias A. J. McIntyre, were charged, on remand, with obtaining, and attempting to obtain, goods by means of a forged order. McIntyre already stands committed for trial upon similar charges.—Mr. Symmonds, who appeared for the prosecution, stated that on the 1st. ult. a camera worth £12 12s. was obtained from R. and J. Beck, Ltd., manufacturing opticians, of 68, Cornhill, on the strength of a written order, purporting to come from Messrs. Corbyn Stacey & Co., Ltd., Wholesale Druggists, of 300 High Holborn. A second order was presented for three cameras and a microscope of the value of £42 16s., and was believed to be genuine. In this instance, however, the goods were not handed over to the boy who was sent for them, as they were not ready. They were afterwards forwarded to the firm, who, of course, repudiated the order. On May 28, a third order, purporting to come from the same firm, was presented at the premises of Mr. J. Morgan Richards, wholesale druggist, of 46, Holborn-viaduct, E.C., and goods to the value of £24 12s. were parted with. It was proved that McIntyre was formerly in the employ of Messrs. Corbyn Stacey & Co., and the forged order was supposed to have been written by him. It was also stated that Kendrick tried to dispose of the camera to Mr. David Matthews, a warehouseman, of Hearn-street, Finsbury.—Matthews said he had known him for 20 years, and looked upon him as an honest business man. When McIntyre was arrested a number of blank order forms were found upon him.—Eventually the Lord Mayor committed McIntyre for trial, and Kendrick was discharged.

Patent News.

THE following applications for Patents were made between July 8 and July 13, 1901:—

SHUTTERS.—No. 13,980. "Improvements in Mechanism for Photographic Roller Blind Shutters." BENJAMIN WILLIAM HORTON.

DEVELOPMENT OF FILMS.—No. 14,079. "New or Improved Means or Apparatus for developing and fixing Cartridge Photographic Films." MAX REICHERT.

FILMS.—No. 14,150. "Improvements in connection with Films for Photographic Cameras." HORATIO HEWITT LEA.

OPTICAL PROJECTION.—No. 14,156. "Improvements in or connected with Apparatus for Optical Projection for Luminous Advertising and other purposes." Complete specification. THE ELECTRICAL "LUMISCRIPTOR" COMPANY, LIMITED, and WALTER CLAYPOOLE.

PRINTING APPARATUS.—No. 14,158. "Improved Photo Printing Apparatus." (William Pinches, New Zealand.) JOHN PINCHES.

CAMERA HOLDER.—No. 14,253. "A New or Improved Camera Holder or Support." ROBERT ABRAHAM LOGAN VAN SOMEREN.

DARK SLIDES.—No. 14,314. "Improvements in and relating to Dark Slide Shutters." WILLIAM BUTCHER, WILLIAM F. BUTCHER, and FRANK ERNEST BUTCHER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
28.....	South London	Excursion: Goring-on-Thames. Leader, S. W. Whiteman.
30.....	Birmingham Photo. Society ...	Excursion: Maxstoke Priory. Leader, Dr. H. Addenbrooke.
August. 1.....	Hull	Monthly Meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 18,—Mr. A. J. Brown in the chair.

The Chairman showed what might by some be exploited as a spirit photograph. It was a view inside St. Saviour's, Southwark, taken whilst sweeping was going on, and the disturbed dust in the beams of light from the windows produced the effect.

Mr. T. E. Freshwater said he had followed up the experiments of printing under leaves described by Mr. Rapson at the last meeting. He could not say that he had produced much "colour" in the prints, although one of them, when wet, was found to be of a bright green colour. The prints were fixed, and the leaves used were of various kinds —rose, raspberry, and hop. The leaves were hard or full-grown for the most part, but young leaves were also tried. Pieces of coloured paper and fabric—red, brown, yellow, and blue—were also used, and under the red paper a distinct red image was obtained, the paper being mauve P.O.P. It would be noticed, he said, that in most of the cases the paper was distinctly blacker where the leaf had been in contact, much darker than the parts exposed direct to the sun, and in some cases the outline of the leaf was marked by a still darker band or shadow.

Mr. P. Everitt suggested that as the season advanced and the leaves deepened in tint, this depth of tint would go some way to explain the difference between the effects obtained by Mr. Rapson and Mr. Freshwater, whose leaves were picked at different times. Probably the chlorophyl was in a different condition. At any rate, it seemed to him that the experiments should be tried with such inert substances as coloured glasses.

Mr. Rapson interposed with the remark that he quite believed that the effect was partly due to something in the leaves, as he never got much indication of colour with blue or green glasses.

Mr. Everitt said the fact that prints made under coloured papers showed a similar action seemed to indicate that it was due to nothing in the leaves of a chemical nature, but that a selective light action was rather the cause.

Mr. A. L. Henderson made the suggestion that the different degrees of facility with which the chlorine in the paper could be given off, or confined, under the leaf might account for the different colours. He instanced the fact that very different tints were produced by tinting the background of a print by sunning down in the open, compared with the colour of the image printed under the negative. In the first case the chlorine was free to disperse, and in the other it was confined between the paper and the negative. A further instance was afforded by taking a negative which required, say, ten minutes to print. The paper should not be looked at until the end of that time, nor the frame opened. Another piece of the same paper under the same negative, examined as per usual at intervals, would give a quite different tint. The print not opened would give a much richer print, due, probably, to the utilisation again and again of the liberated chlorine upon the remaining free silver. He suggested that the leaf confined the chlorine, and in the manner described produced a tint darker than that of the paper that was not protected at all from light.

A discussion ensued upon the composition of the deposit to be found in used solutions of hyposulphite of soda.

Mr. Henderson said that he washed his plates between development and fixing, but in a few days the solution was much discoloured. If then, he added fresh hypo, down went a black deposit. It was stated that different developers produced different stains and sediments, and, further, the condition of the bath respecting acidity or alkalinity would be a factor. The matter was discussed at some length, but no authoritative statement was made in answer to the question.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

F. Temple, 2, The Arcade, Walsall. *Photograph of three phonographs.*

H. Lowthian, 144, Freeman-street, Grimsby. *Photograph of Grimsby Fish Docks.*

W. Plumbe, 76, High-street, Maidenhead, Berks. *Photograph of E. Gardner, Esq., M.P.*

D. Gordon, The County Studio, Cupar, Fife. *Photograph of oil painting of Sir R. Anstruther and horse.*

C. Treasurer, 21, Inglis-street, Inverness, N.B. *Photograph of shinty: starting the game. Photograph of an old building*

COPYRIGHT.—"HYPO" writes: "I have an old drawing over 200 years old in my possession. I want to reproduce this for sale. Can I protect it by registration?"—In reply: Yes, certainly. But it will not prevent any one else from copying the original drawing if they obtain possession of it.

ADDRESS WANTED.—C. CANTRELL writes: "I see in last week's JOURNAL Messrs. Underwood and Underwood are publishing the "Stereoscopic Photograph." Will you please say where I can get it?"—In reply: Probably a copy may be obtained at Messrs. Underwood's London address, Red Lion-square, W.C.

ANXIOUS.—We scarcely know how to advise you. If you wish to continue in photography, we can only suggest that you either commence business somewhere on your own account, or else obtain employment with some photographer. Neither the piano nor the violin will help you in photography. We are sorry we cannot advise you further.

FERROTYPES.—P. H. H. writes: "Could you oblige me with the address of the makers of the Nievsky or other similar camera, for the working of 2×1½ dry ferros for seaside work, or any second-hand dealer?"—In reply: Fallowfield's, Charing Cross-road, make a speciality of material for the ferrotype process, and can supply all that is necessary. Mr. Nievsky is dead.

TRANSPARENCIES ON CELLULOID.—"AMATEUR" asks how to fix transparent celluloid on to photographs.—In reply: Develop the carbon print on the celluloid as if it were single transfer paper. Or it may be developed on flexible support, and then transferred to the celluloid, which has previously received a coating of gelatine containing a little chrome alum, after the manner of the double transfer method.

PAPER FOR BACKGROUNDS.—M. D. writes: "I should be greatly obliged if you could tell me where I could get paper for 'painting in' backgrounds? I cannot get the 'carpet felt' sufficiently wide for the purpose."—In reply: We know of no paper wider than the carpet paper (which may be had up to sixty inches wide), unless you have cartoon paper, as sold by the artists' colourmen, but we are not sure that it is much wider.

AGREEMENT.—SEPIA BROMIDES.—"CURIOUS" writes: "(1) Seeing in last week's issue a question about an agreement for term which 'X.Y.Z.' asks, may I ask if this law applies to this island (Jersey) as well as in England? (2) I see continually advertised red, sepia, and different kinds of bromide, which are guaranteed permanent. I have tried toning bromides, but cannot say that I have had any that will stand for any length of time. Could you inform me of a thoroughly permanent method?"—In reply: (1) We cannot answer this query with certainty, as the law in this respect may be different in Jersey from what it is in England. (2) We do not know of any method of toning bromide pictures that we should consider thoroughly permanent, or as permanent as the untoned print

A Day's Work.—"Beauchamp" asks: "What should you consider a fair or average day's work for a printer, assisted by a lad? The work consists principally of cartes and cabinets in P.O.P. They have almost unlimited facilities in the matter of frames, room, &c., &c."—In reply: This is a matter we can express no opinion upon. Of course, much must depend upon the light, the care that has to be bestowed upon the negatives in printing, shading, &c.; also whether "slapdash" or high-class prints have to be produced, and many other things.

Damaged Daguerreotype.—A. Mackenzie writes: "Would you be good enough to help me with your valuable advice regarding Daguerreotype sent herewith? The face has been, as you will see, blotted out with a finger. Is this reparable? If so, would you send it to an expert, or give me his address? If not, would it be possible to get a decent copy negative made?"—In reply: As the face has been completely rubbed away nothing can be done in the way of restoring it. What is left of the portrait can, of course, be copied, but the picture without the face would be of no use to any one. The Daguerreotype has been returned by post, as requested.

Copied Photographs.—"Wales" writes: "I often have other people's photographs brought to me to copy. Should I mount them on my own mounts, with my name and address, or ought I to put them on plain mounts? If I do the latter, I may lose orders for further copies; and, if the former, some of the copies, by reason of the faded state of the originals, are no credit to me?"—In reply: You can, of course, do either; but the better plan is to mount them on your own mounts and write above your name "Copied by." Still better would be to have a rubber stamp bearing the words, and impress over the name. It would look neater than the writing.

Fever Cured by the Dark Room.—R. K. H. M. writes: "Could you inform me in what number of your paper was contained the paragraph on 'Fever Cured by the Dark Room?' If you can't remember said number, could you reprint what you said re fever cured by the red light of dark room, as I am desirous of giving same a trial, a little friend of mine having taken scarlet fever a few days ago?"—In reply: We have no recollection of the paragraph, or that we had an article on the cure of fever by the red light of the dark room. We should recommend your friend to put his child under the care of a medical man, instead of experimenting on the child's health by dark-room treatment.

Detention of Specimens.—"A Poor Operator" writes: "In answer to an advertisement I got a reply asking me to send specimens and testimonials, which I did, sending nearly all my best pictures. I heard no more, so at the end of a week I wrote asking for the return of the specimens, and got no reply. I have written several letters since, with the same result, except that the last one was returned by the Post Office marked 'Gone away.' Can anything be done?"—In reply: The only thing we suggest is that you write to the Superintendent of the Police of the district to which the prints were sent, stating the case, which is one of deliberate fraud. He may possibly be able to bring the delinquent to justice. He deserves severe punishment.

Photographers' Insurance.—M. Buckley writes: "On Friday night, the 12th inst., a fire broke out at a shop of a Mr. Laird, a chemist and photographic dealer. My establishment is next door, and all, or nearly all, the reception room and dressing rooms were destroyed, as well as thousands of my most valuable negatives, some of them worth, to me, £50, and all the insurance company will allow is 1s. each. They say no company will allow more. If you could give me some advice about the matter, I would feel obliged. I think this would be a good thing for the P.P.A. to enter into, and will send my subscription next week."—In reply: A shilling each is the limit at which insurance companies assess the value of negatives, and that limit is usually mentioned on the policies. You will probably find it is the case on yours. The companies will, however, insure them individually to any value, but that must be done on a separate policy, each negative being specially mentioned, and a special premium paid for them.

An Operator's Engagement.—"Agreement" asks: "(1) Can legal proceedings be taken against me if I go to photograph some groups for my firm at A—, which is over forty miles from Z— (my present business firm), as I signed an agreement whilst at A—, of which this is an extract:—'If the engagement is determined at the end of the said month, or at any time afterwards, the said "Johnnie Camera" shall not, either by himself or jointly with any other person or persons, engage himself to any other photographer in A—, or within a radius of twenty miles thereof, or be interested in any such business, either as principal or agent, and on his so doing will pay to the said "Mr. Employer" the sum of £5 per day in which he shall so engage himself as liquidation damages.' —In reply: If the place where the group is to be taken is not within the twenty miles radius, of course, there is no hindrance. You, in taking the group, will, of course, be acting as the agent of your employer.

Stereoscopic Photography.—J. Ritchie writes: "Knowing that you take an interest in stereoscopic work, I enclose a description of a method of making transparencies by artificial light which I have been using for some time, and you may not have seen before. If you think it of general interest, you may use it in any way you like. In the Almanac for 1900 you describe a stereoscope with prisms and a concave mirror. Can you let me know where one may be had? I have tried several dealers here, but they are unable to obtain one. I am afraid that they will come rather costly, but would like to have one if possible."—In reply: We are obliged to our correspondent for his description of binocular transparency making by projection: the article shall appear next week. With regard to the stereoscope referred to, it is not, so far as we know, an article of commerce, but a letter addressed to Sir Howard Grubb, Rathmines, Dublin, might elicit some definite information on the subject.

Flashlight Work—Enlarging.—"Progressive" writes: "(1) I am anxious to purchase a reliable lamp, or series of lamps, for flashlight work generally, and more particularly for use in the wings of a small theatrical stage, to take photographs of tableaux, &c., at night. Can you assist me in the choice? As there are a number of 'properties,' which are very inflammable, it is very necessary that the lamps shall be safe, with ordinary care. (2) Can you give me any particulars as to whether there is a book published upon the art of working up enlargements? I have given a good bit of time to this branch, and can get very nice results in the light in which they are finished, but when the pictures are viewed in any other light the brush marks are unpleasantly shown. I feel sure that there is some small matter preventing my complete success."—In reply: (1) The safest light to use, under the circumstances, would be the Platinotype magnesium lamp, as with that the flame is enclosed, and cannot set fire to anything. It is supplied by the Platinotype Company. (2) The work by Bool is the only one we know on the subject. It may be had through any of the dealers. One or two practical lessons, however, would probably be more useful to you than books, as you are successful up to a certain point.

Books on Photography.—"Cor in Opere" asks: "(1) Which is the standard work on the lens? or what book will give, in a not too technical fashion, a knowledge of lenses sufficiently comprehensive to enable one to value more his work? (2) Which is the standard work on carbon printing? (3) Which is the standard book on the studio, as regards (a) posing, (b) lighting, and (c) studio building, &c.? (4) Can you recommend me a good book on picture-making? You will pardon me telling you, as I regard you and the Journal as friends, that I am commencing business 'on my own' in January, and I wish, as a student, to make up (by reading) for the ignorance of those who have been paid to instruct me on the above subjects. Any other books you may mention I shall [illegible]ly devour."—In reply: It is difficult to say what may be considered "standard" works on the subjects. But the following are all good:—(1) "The Optics of Photography," by the late J. T. Taylor; (2) "The Manual on the Carbon Process," by the Autotype Co., also a pamphlet issued by Elliot and Sons; (3) "The Lighting in Photographic Studios," by Duchochois; "Studio-Building," by Bolas; (4) "Picture-making by Photography," by Robinson. On pages 662–3 of The Almanac you will find a list of books on photography, all of which may be useful to you. The prices of these are given in the list.

Stereoscopic Photography.—"Gamma" writes: "Would you kindly inform me in your Answers column which focus of lens would be the better for stereo work—a Zeiss series 3a 4¾ in., or same series 6 in.? I am limited to one pair, and wish to have the most useful. I note that Dallmeyer, in his catalogue, recommends 4½ in.; in the 1900 Almanac you (the editor) suggest 5 in.; the Thornton-Pickard Co. (whose Ruby camera I am having fitted for stereo work) recommend 5½ in.; and I note in the 1901 Almanac that the favourite lenses of G. W. Wilson and F. Bedford were of 6 in. focus. I may mention the camera is half-plate, and I would like to make the prints higher than usual, say, 4½ high, and there will be little, if any, interior work. To summarise: (1) Which lens would be the most useful? (2) Can you recommend a good modern manual on stereo work? (3) Can you refer me to any back numbers of the Journal containing useful information?"—In reply: (1) For work of the ordinary stereoscopic size, the 4¾ inch focus would be the most useful. But if you wish the pictures 4½ inch high a lens of six inches focus would be preferable. (2) There is no modern work on the subject; but the articles in the Almanacs give all necessary information. (3) So many articles have appeared on the subject in the early volumes of the Journal that we regret that, just at present, we have not time to look them all up.

KEY TO THE CONVENTION GROUP.

In order to afford us the opportunity of making the Key to the Convention Group as complete as possible, we are deferring its publication until the next issue of the Journal.

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EX CATHEDRÂ.

New Test for Chlorine. A very pretty blowpipe test for this halogen is described by Mr. Henry W. Nichols in a recent number of the "Chemical News." It is founded on the varied colours produced upon different salts of cobalt upon warming. Absorbent paper, moistened with solutions of the bromide or iodide, with nitrate, and other salts, give respectively green, deeper rose, and darkening, and no change at all when warmed. Cobalt nitrate and a soluble chloride act like cobalt chloride. To apply these reactions to practice, the substance to be examined is powdered and mixed with four times its weight of potassium bisulphate, and the whole placed in a closed tube, a fragment of paper moistened with cobalt nitrate being placed in its mouth. Upon fixing the mixture the paper will turn a bright blue if chlorides are present. If bromides or iodides are present the colour will be bright green. If the quantities are very minute, it may be necessary to dry the paper before the colour shows. When chlorides and bromides are both present the paper turns first blue from chlorine, and, later, green from bromine. Chlorides in solution may be tested by dipping a piece of paper in the solution, spreading a drop of cobalt nitrate solution upon it, drying and heating, though this test is not a delicate one, and the distinction between chloride and bromides is obscured. As these tests would be very useful in a preliminary examination of a dry plate or printing-out paper, it is obvious that the last-named would be of little use, but we include it in this brief abstract, as it forms part of the scheme described.

* * *

Another Electric Weather Forecaster. Quite recently we described a novel method of weather forecasting by the humming of telegraph wires. The latest adaptation of electricity in this direction is by "wireless telegraphy." Signor Jammasina is responsible for this new departure, which he considers is much more reliable than the use of the present instruments employed for predicting weather. The apparatus consists essentially of a coherer with its vertical wire, an electro-magnet, a dry cell, and a telephone. The experiments were carried on at Geneva, and fully described before the Paris Academy of Sciences. When a storm passed over discharges were indicated by an electric bell, the strength or distance of the discharge being indicated by the vigour of the stroke of the bell. When the weather changed without a thunderstorm, a peculiar crackling was always heard in the telephone, and rain could be predicted by these means with great certainty twelve hours in advance.

* * *

An Improved Method of Producing Plates Sensitive to the Ultra-violet Rays. It will be remembered that some few years ago we published Herr Victor Schumann's method of preparing plates for this purpose; but recently he has greatly improved his method of working, a translation of his paper now appearing in the "Chemical News." He points out that he has already explained that the well-known decrease of sensitiveness and intensity in gelatine dry plates from 220 $\mu\mu$, towards the shorter waves is caused by the insufficient transparency of the gelatine medium to those rays. The method he formerly

published had, as he had stated, certain drawbacks which he has for a long time past been endeavouring to get rid of. He has now evolved a process which enables him to get spectral pictures beyond 185 $\mu\mu$, "with growing success." In its fundamental features the improved method may be represented as follows:—"A silver bromide gelatine emulsion, very rich in silver, is prepared, allowed to stiffen, washed, and dissolved in much water, then filtered and poured upon glass plates upon which the silver bromide is deposited. Half an hour afterwards the emulsion is poured off again. The fine film of silver bromide which remains on the plate dries, on account of its thinness, in a very short time. Immediately after drying the plate can be used for photographic purposes." In the paper in question very complete instructions are given, sufficient indeed to render it quite easy for any one to repeat Herr Schumann's metho with absolute certainty. The first part of the paper appears on page 484.

* * *

Testing Chloride of Gold Sodium. Practically speaking, "chloride of gold" is not used in photography, the double chloride being almost invariably supplied; though all the kinds that are sold are called by the generic name of "chloride of gold." If it be desired to test a given sample, a very simple plan is described in the "Journal" of the Society of Chemical Industry by Messrs. Johnson and Sons. Fifteen grains of the sample (the quantity usually put up in a tube) are dissolved in an ounce of water, the metal is precipitated by sulphurous acid, collected in a filter, ignited and weighed. The error of the assay may be ascertained by dissolving seven grains of pure gold in nitro-hydrochloric acid, evaporating, re-dissolving, and reducing in exactly the same manner, and the corresponding correction is made in the result. It is not probable that the average photographer would go to the trouble of performing the last part of the instructions; but he could get quite near enough for commercial purposes without the check experiment. The sulphurous acid in solution can be bought at any chemist's, and a pair of scales with a beam graduated to tenths of a grain can be purchased for a few shillings.

* * *

An Art Night n the Lords. The House of Lords on Monday last week had what may be termed an artistic night, when Lord Stanmore moved:—"That an humble Address be presented to His Majesty praying that His Majesty will direct the appointment of a Royal Arts Commission, similar in character and object to the Fine Arts Commission of 1842." The Marquis of Salisbury, in opposing the motion, which he did on the ground that the expense which would be incurred by such a Commission would not yield a commensurate return, made some trenchant remarks. He said, "We cannot set in motion any spontaneous machinery by which the artistic enthusiasm of the people can be perpetually generated." In the course of his speech he pointed out that there are infinite differences of opinion in all matters of art, and that what one school approves another condemns. That, by the way, is as well exemplified in photography as in painting and decoration. Lord Rosebery, who followed the Prime Minister in the discussion, while not supporting the motion, made reference to our national collection of portraits, and put in a plea for greater liberality in that direction, which at present is limited to £1,200 a year. Now, we all know that at the price that pictures, even portraits, realise at auction sales nowadays, our national collection of portraits cannot be very rapidly enriched. Lord Rosebery suggests that the Treasury should enable the Trustees of the National Portrait Gallery, from time to time, to commission a distinguished artist to paint the portrait of some man of whom posterity will take account. With this we think every one will agree, but then comes the question of the money, and the sum now at the disposal of the Trustees will not go very far in that direction. Now seeing, for want of money, that body cannot secure portraits, as paintings, which it is very desirable should be in our National Portrait Gallery, why should not photography be utilised if a separate gallery were set apart for it? We would not for a moment suggest that photographs and paintings should be mixed up together. The object of a National Portrait Gallery is to collect together the portraits of persons who have distinguished themselves in such way as to render themselves of national interest—statesmen, warriors, artists, men of letters, scientists, and the like—and if we cannot have paintings of them by illustrious artists, let us have their portraits in some form or other, on the principle that "half a loaf is better than no bread." Present day photography is very different from what it was some years ago. There are photographers who can take portraits that would not disgrace an art gallery, indeed, would, in an art sense, be better than many to be seen in the present collections. Furthermore, we have processes that will yield pictures quite as permanent as oil paintings, and of a size as large as many that are now in the collection. Such portraits may be done at a quite nominal price as compared with what an artist, of even moderate reputation, would require to paint them. Hence our suggestion that we should secure the portraits while the individuals are alive by the only practical means at our disposal, and that while the opportunity exists.

* * *

Lightning Photographs. This year photographers, at least in the London district, have had but little opportunity of obtaining photographs of lightning. The opportunities of securing them under favourable conditions are often few and far between; therefore it is well for those who wish to obtain this class of picture to be ready at a moment's notice to take them. The storm of Thursday last week was, in London, a record one, but there were no opportunities for photographers, inasmuch as it occurred at mid-day, and it is only at night, when it is dark, that successful results are to be had. We have frequently referred to the unreliability of the weather forecasts as issued by the Meteorological Department, and that storm may be taken as an example. The forecast, as issued at 8 a.m. on Thursday morning for the London district, was that we were to expect a few local showers, but that it would be fair generally. Within four or five hours of the issuing of that forecast we had a greater thunderstorm and a larger rainfall than we have had for very many years in so short a time. Now, had the storm occurred at night, it would have been a grand opportunity for photographers to obtain photographs of the electrical discharges, which were exceptionally vivid and varied, but would they have been prepared for it? They certainly would not if they relied upon weather fore-

casts. Therefore we recommend all who are anxious to secure photographs of lightning to be always prepared for the work, so that it can be done at once with any apparatus. Here is a hint or two that may be useful to those who may attempt to photograph lightning flashes for the first time. Focus the camera accurately on some very distant object, and mark the point on the baseboard. All is then ready for use at any future time at a moment's notice, as the dark slides will only take a few minutes to fill when a storm is seen approaching. The camera is then placed in position at a window, or other position that will command a good view of the sky in the direction of the storm, with the cap of the lens removed and the shutter drawn. Then when a flash has occurred the lens is capped, the shutter closed, and the slide reversed for the next flash, and so on. It is not desirable, when it can be avoided, to include two flashes on the same plate. With regard to the lens, any will suffice, but one of the anastigmat type is preferable, inasmuch as it has a flat field, and includes a wide angle, for it is impossible to judge at what part of the plate the discharge will be depicted. But with a lens of this type the image will be sharply defined anywhere with a fairly large opening. Specially rapid plates are not necessary, or desirable, for this class of work. The novice must not expect that every plate will turn out a good negative, for experienced workers do not expect so much as that. If backed plates are to hand they should always be used. Good photographs of lightning are very interesting, apart from their scientific value, and those who are successful in obtaining them are naturally somewhat proud of their achievements. Photographs of lightning make good subjects for the lantern.

VOCAL PHOTOGRAPHY.

It is now some years since it was discovered how to make a thin and transparent ribbon of celluloid, upon which could be supported a series of many hundred photographic pictures. Such a ribbon bearing a series of pictures constituted the first animated photograph, and it was exhibited by means of the instrument brought out by Edison, and known as the kinetoscope. This transparent ribbon of celluloid made "animated photography" possible, and it was but a question of mechanics to adapt such a ribbon to the optical lantern so as to project the pictures on a screen. Another instrument, the phonograph, whose godfather was also Edison, had been given to the world more than a decade previously, and although the most exaggerated anticipations had been conceived as to its possibilities in preserving for all time the voices of gifted soprani and tenori, it had proved to be merely a scientific toy—certainly a very beautiful example of practice founded on theory—and had been put aside out of men's minds.

But there now seemed a chance of resuscitating the older instrument. It was thought that if the phonograph could only be married to the cinematograph, the union would lead to the most wonderful results. The American papers were, at one time, full of the new idea, and pictures were published showing how Edison had erected at his magic laboratory at Menlo Park a theatre in which the actions of a skilled company were recorded by the cinematograph, while their sayings and songs were registered by a phonograph. By means of this combination, which seemed to be so feasible, on paper, we were promised the reproduction of all the sounds and scenes of favourite operas, &c., &c. These anticipations have not been realised. In the meantime the cinematograph has been largely employed as a means of public entertainment, and there is hardly a music hall in the kingdom which has not added it to its nightly programme. There is no doubt at all about its success, and it may be truly said that something very near perfection has been reached in the best form of cinematograph apparatus. It was fortunate that the instrument happened to be brought forward at a time when the most powerful form of artificial light, that afforded by the electric arc, was readily available; because upon the power of the light depended the possibility of showing the pictures on a highly magnified scale, so that they could be appreciated by a large number of spectators simultaneously.

Unfortunately for the phonograph, there has not yet been discovered any means by which its sounds can be similarly magnified. As originally presented to the public, it was an instrument for private use, almost for the individual ear, and although its scope was increased later on so that half a dozen persons could listen to it at the same time, this was only accomplished by means of ear-tubes for their separate use. In this way the phonograph was heard to the best advantage, although its performance still left much to be desired. It gave a parody of the sounds originally submitted to it, rather than a correct reproduction of them, and we can imagine that a Patti or a Sims Reeves would listen to their vocal efforts, as recorded by it, with a feeling of surprised amusement rather than satisfaction.

The next advance was to fit the instrument with a kind of huge speaking-trumpet, so that it could be heard by a large company, but it was at the expense of good intonation, and its squeakiness, of the Punch and Judy order, always one of its marked characteristics, became magnified together with the volume of sound. In short, we may say that while the cinematograph gives a very perfect representation of the scenes which it has absorbed, the phonograph gives a very imperfect idea of the sounds traced upon its cylinder. The union of the two instruments has therefore not prospered to the extent which was anticipated for it. Indeed, we may say that the attempt to reproduce an opera, or anything of the kind, has been abandoned, except perhaps by enthusiasts who will never acknowledge a defeat.

So far as we can learn no attempt has been made to submit the efforts of Edison's laboratory company of actors and singers to public criticism, but there have been one or two endeavours to reproduce, by means of the combined instruments, the performance of a single individual, generally a comic singer. It is by no means easy to stage-manage such a combination, and, although it has been done with partial success, there are reasons why such an enterprise must be regarded as a scientific curiosity rather than a permanent addition to the resources of the public entertainer. First with regard to the performer himself. He must be a first-rate actor, a good elocutionist, and a competent singer. It is difficult to find such an admirable Crichton on the variety stage. However, suppose that such a rara avis is discovered. A sound record of his performance is made by the phonograph; for to get the best results he

must place his mouth close to the instrument. He has next to go through a careful dress rehearsal of the same performance, prompted by the phonograph, suiting the action to the word all through, going over the thing again and again, until he keeps exact time with the phonographic record. When perfect, the cinematographer comes upon the scene, and takes the necessary "film" of the performance on an improvised open-air stage. If all has been done properly, the result is an animated picture which will keep time with the phonograph, and the animated photograph becomes endowed with speech and song. So far so good, and we have a very pretty combination adapted for an appreciative audience in a small room.

It is when the film is shown to a moderately large audience that the trouble comes in. If the song or speech is very familiar to those present, they can follow the sounds, but not easily, provided that each one strains his ear and keeps very quiet. But such conditions do not often prevail in a public assembly on amusement intent, and even if silence is maintained for a short time, it quickly goes if an audience is at all bored or disappointed. But another difficulty crops up. All public speakers know that to make their performance effective they must pause for laughter and applause. It is only the inexperienced who will plod on through such an interruption, with the result that half his words are unheard. The combined phonograph and cinematograph is like the inexperienced public speaker, it takes no heed of interruptions, but goes on and on until the film is all wound off its reel. Indeed, it cannot stop without serious risk of disaster, by reason of the heat concentrated upon the highly inflammable celluloid. For this reason all cinematographs are furnished with a metallic shutter which at once drops over the film to protect it from the heat should the mechanism, for any reason, stop working. Possibly some of these objections may be overcome in the future, but at present they seem to afford good reason why Mr. Cinematograph and Miss Phonograph should not be joined together in the bonds of matrimony.

AN IMPROVED METHOD OF PRODUCING ULTRA-VIOLET SENSITIVE PLATES.*

[Reprinted from "The Chemical News."]

It is a known fact that the sensitiveness and intensity of the gelatine dry plate decrease considerably from the wave-length 220 $\mu\mu$ towards the shorter waves. I have already demonstrated that the cause of this decrease lies in the insufficiency of transparency of the gelatine. Silver bromide itself gives rise to no such decrease of sensitiveness, nor does this happen when working with very small quantities of gelatine.

Upon this fact was based my former method of producing ultra-violet sensitive plates, which enabled me to investigate the rays beyond 185 $\mu\mu$. This method had its drawbacks, as I did not fail to point out at the time. I have been occupied till quite recently in obviating these drawbacks.

In this manner I have gradually obtained a plate which essentially supersedes the original in purity, in reliability, and in delicacy of gradation in the intensity. With this plate I am now carrying out my observations of the spectrum *in vacuo*, with growing success.

In its fundamental features the improved method may be represented as follows:—A silver bromide gelatine emulsion very rich in silver is prepared, allowed to stiffen, washed, and dissolved in much water, then filtered and poured upon flat glass plates, upon which the silver bromide is deposited. Half-an-hour afterwards the emulsion is poured off again. The fine film of silver bromide which remains on the plate dries, on account of its thinness, in a very short time. Immediately after drying the plate can be used for photographic purposes.

Still better results are obtained if the heavier particles of silver bromide are removed from the emulsion before filtering. The formation of the film requires in this case several hours.

Preparation of the Emulsion.—In detail the method is as follows:—9 grammes potassium bromide, 4·5 grammes gelatine (Nelson 1.), and 60 c. c. distilled water are placed in a beaker of about ½ litre capacity; further, 11·25 grammes silver nitrate and 60 c. c. distilled water in a boiling flask of ⅛ litre capacity; and 20 to 30 minutes later, after which time the gelatine is sufficiently swollen, both are placed in a water-bath at 50 to 60° C., in which they remain until the melting of the gelatine is complete.

Then, using the brown or red dark-room light, the silver solution is passed in a thin stream, or in small portions, into the gelatine solution, continuously shaken, and, after closing the beaker, its contents are vigorously shaken.

The vessel is now placed for half-an-hour in a water bath at 60° C., after which its contents are carefully poured out into a porcelain basin, so that the deposit of silver bromide remains behind as far as possible. The basin is placed in the cold (not above 4° C.), or upon ice, when the emulsion is sufficiently stiffened in two to three hours. The firmer the emulsion becomes, the more easily is it broken up, this being a necessary prelude to the washing.

The emulsion, cut up into small pieces with a horn spatula, is heaped up in the middle of a piece of muslin, which is then fastened together into a bag. The bag is allowed to run for two or three hours in running water, or, if this is not convenient, in a deep glass holding at least two litres, which is filled with water not above 14° C. After changing the water ten times at intervals of a quarter of an hour, the dissolved salts ($KBr.KNO_3$) whose removal is to be effected are washed out. The bag is now taken out of the bath, lightly pressed to remove the water adhering to the gelatine, and then hung in a glass beaker of one and a half litre capacity, which contains 950 c. c. freshly boiled out water, cooled down to 55° C. The emulsion dissolves in it in a few minutes. It is gently stirred with a glass rod, and then twice filtered through glass-wool (which is firmly plugged one cm. deep in the tube of the funnel) into a clean beaker. The layer of wool must be of such a thickness that the emulsion only runs through slowly. The formation of bubbles must here be avoided more carefully than before by stirring with the glass rod. This is best assured by allowing the emulsion to flow from the mouth of the funnel down the side of the flask in a constant stream.

After filtering, the emulsion is immediately poured upon the glass plates, which will be pr sently described.

It has been shown that plates of this kind are liable to surface faults, which are apparent before development as streaks and numerous dark spots, and which develop simultaneously with the picture on plates that have been kept for some time before usage. In cases where these spots are objectionable, it is best to remove from the emulsion the coarser of the silver bromide particles which it always contains in varying sizes. This can be done by pouring out the dissolved emulsion before it is filtered into a basin with a flat bottom, and allowing it to stand for three-quarters of an hour. In this manner the heavier silver bromide, which seems to favour the formation of spots, is deposited, and fine particles, which yield purer and more reliable films, remain behind in the liquid. But the deposition in the basin only answers its purpose when the layer of liquid for the stated time of deposition is correspondingly thin. I obtained the best results from a layer four to five mm. thick.

Preparation of the Glass Plates.—The glass plates require a different preparation from ordinary photographic plates, if they are to hold, without danger of spilling, the unusually large quantity of very liquid emulsion required for the formation of the sensitive film. If one desired to use the ordinary photographic glass plate, the emulsion would overflow before it had been poured on in any quantity. This does not happen if the sharp edges of the plate are ground away.

* "Annalen der Physik," 1901, vol. v.

This is most easily done by means of coarse particles of emery—emery paper is less well adapted for the purpose—which are laid upon, or firmly fastened to, a smooth foundation. The glass plate, inclined (30°) to the emery surface, is scraped upon this until a rough face of about $\frac{1}{2}$ mm. breadth is uniformly produced in place of the sharp edge. This breadth is immaterial; the principal point is, that the sharp edge of the plate shall be everywhere converted into a rough surface, otherwise the untouched parts give an easy outlet for the overflow of the emulsion.

After this the plates are dipped for an hour or longer in nitric acid, washed with water, dried with a clean cloth, polished, and dusted. It is advisable to polish shortly before covering the plates. If a longer time elapses between the two operations, the emulsion flows less well, as the plates very readily reabsorb gases.

Before covering, the plates are laid side by side at a distance of from 1 to 2 c.m., upon a long, narrow, level plate of mirror glass, which stands on feet about 8–10 cm. high. For convenience later, when the emulsion is to be poured on, it is advisable to let the plates project on the side of the operator with their long side 2 to 3 cm. over the edge of the mirror.

Covering the Plates.—This must be performed as soon as possible after laying the plates on a level mirror glass and filtering the emulsion. One pours over little plates immediately out of the supply-flask, which is held with its opening very near the receiving surface to avoid the formation of bubbles; with larger plates the quantity of emulsion for each plate is measured off. In the first case the emulsion is poured on till the plate is covered with it—50 to 60 c. c. are necessary for plates 13×18 cm. For the plates for my own use—which measure only 9×13 cm.—I need 25 c. c. One must always endeavour to cover the nearer corners, those on the side of the operator, before the further ones, for sometimes the emulsion flows slowly, and does not reach all the corners. Then instead of adding an excess of emulsion, it is better to assist the covering of the corners by carefully and gradually raising the opposite side of the plate. And this is more readily carried out on the near side than on the other. Whilst doing this, one must avoid disturbing the edge, and should rather press against the underside of the mirror.

Deposition of Silver Bromide for Formation of the Sensitive Film.—The covered plate must be protected from dust during the hours of deposition of the silver bromide; it is also advisable to check as far as possible all evaporation, so as to preserve the original concentration of the emulsion. I attain both objects by covering the mirror glass, on which the plates stand, with a large pasteboard box covered on the inside with shellac varnish, and excluding all light. The temperature of the room, during formation of the film, should not be below 18° C. In three to four hours there is a sufficient deposition of silver bromide. There is a supernatant layer of emulsion, poor in silver, and of milky aspect, which can be poured off without detriment to the film. This is the only part of the whole process which demands special attention in order to secure a successfully prepared plate.

To Pour off the Emulsion.—This is conducted in the following manner, always beginning with the first plate on the left, the glass mirror being in front of the operator: The plate is now pushed out over the nearest (left) edge of the supporting surface, till about $\frac{4}{10}$ of its length projects. Beneath this is placed a deep evaporating dish, which is 1 to 2 cm. wider than the plate. If the plate is now raised from beneath with the first finger of the left hand, high enough for it to turn about the margin of the mirror plate, its free end sinks into the dish, whereby the emulsion flows off over both corners, and one can take hold of the plate by the edges of the raised corners, remove it, and stand it up to dry upon a board covered with blotting-paper, and bearing a row of vertical wooden rods, against which the plate leans with the film side downwards. In pouring off the emulsion and placing the plates on the drying board, the plates should be held to prevent the formation of streaks, so that the emulsion flowing along the edge cannot trickle across the silver bromide coating. The streaks thus confine themselves to the immediate neighbourhood of the margin, and may be cut away, but do not affect the larger plates.

To Dry the Film.—The drying of the plate may be carried out in a room free from dust, or in a drying cupboard. The latter is preferable, as the film is very sensitive to air currents, which produce zones of drying, and these show themselves in the negative as varying intensity in the film and noticeable lines. The tendency to formation of zones is greater in this film, which dries very quickly, than in the ordinary gelatine dry plate. A quarter of an hour is sufficient for drying under some circumstances. In my dry cupboard, which in this case I do not ventilate, these plates require from half to three-quarters of an hour. If the plate is required for exposure as soon as possible, it may without hesitation be wiped with a strip of blotting-paper.

To Keep the Plates.—I lay my plates together in pairs, film against film, with a narrow strip of blotting-paper between the edges, and wrap them up in black paper. It is best not to put more than one pair together in a packet, on account of possible damage to the film. The packets are stored in a plate cupboard or a light-tight box in a dry place.

Unbacked plates tend to become fogged sooner than those in packets. But plates which are to be used shortly after preparation may be kept without packing from eight to fourteen days in a light-tight place. But I must add a warning against tin-plate receptacles. This metal seems to cause fogging, even without direct contact.

The Dry Plate.—Its colour is milky white, with a touch of green, in reflected light, and dark yellow in transmitted light, and the film less pure than it appears to be in the former case. Even after innumerable attempts I have not yet succeeded in preparing such homogeneous films as can be obtained with the silver bromide gelatine plate. With the most careful cleansing of the emulsion, and observing the greatest cleanliness throughout, it still shows differences in intensity, dark spots, and sometimes holes like pin-pricks. If it is compared in transmitted light with an ordinary dry plate, it gives very little impression of trustworthiness, on account of its transparency and the thinness (0·003–0·004 mm.) of its film. The attempt to gauge its spectrographic value in this way would result in a very unfavourable judgment of its adaptability to exact spectral uses. But experience has proved that the opposite is the case—that these film blemishes in no way spoil the purity and definition of the spectrum lines, as they only appear in the negative when the plate is too old and is already fogged.

The plate is specially sensitive towards mechanical impressions. Thus it cannot even bear dusting with a brush; the finest hair leaves traces which are obvious before developing, and more so afterwards in the negative, where they appear as fine black lines.

For the same reason it requires, on cutting, very careful handling. It is best cut through the film, when narrow strips of paper, not too thin, should be laid upon the edge of the plate under the ruler which guides the diamond. One must beware that the strips of paper may leave behind spots which develop simultaneously with the picture. Therefore the strips should be so narrow that the part of the film which is to receive the spectrum may not be injured.

The Stability of the Plate.—For the first few days after preparation the plate is not very sensitive and it lacks intensity. Therefore at this time it needs unusually strong developers, solutions of a concentration which could not be used for the dry plate for fear of fogging. In this case there is no fear of displacing the film. The coating of the plate exhibits great resistance capacity towards certain chemicals. Fuming nitric acid, concentrated sulphuric, hydrochloric, and potash solution 1 : 3, &c., do not attack it. Fuming nitric acid destroys neither the latent nor the developed picture. The acid merely diminishes the intensity. This behaviour of the film is all the more remarkable in that gelatine, which is one of the constituents of the film, is easily soluble in nitric acid. We must conclude from this that the degree of solubility of the gelatine is in this case dependent on the thickness of the film.

The plate increases by keeping in sensitiveness and intensity; one to two weeks after the preparation, both give evidence of a marked increase, and there is a further increase especially exhibited in the latter. Plates one to two months old have given me the best results. In the third month there are already traces of fog. But by a large addition of potassium bromide to the developer transparent negatives can still be obtained. Plates stored in dry air have even kept

faultless for nearly two years, but with these there is a noticeable decrease of sensitiveness. As the clearness of the picture in this case depends upon a further increase in the addition of potassium bromide, which lengthens the time of exposure, I cannot recommend so old a plate. V. SCHUMANN.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.*

THIS Association, whose birth we chronicled in May, has now got down to business to the extent of electing a working committee, of formulating a policy, and of commencing an active drumming of the country for members. As a happy augury it is said that the special cause, the final straw of outside competition, which brought about the forming of the Association, has already been removed. We sincerely trust this is so, and would point out that if those firms who roused the ire of the profession by offering photographs as premiums have really withdrawn their schemes at this early date, it is more through an act of courtesy on their part than through any pressure which may as yet have been brought to bear.

In fact, they may be safely regarded as solid benefactors if their action has made union among photographers a fact. It should not be forgotten either that in all probability the whole suggestion of such premiums was made and put through by some firm of "trade" photographers, and that it is primarily due to action *within* the photographic camp that the obnoxious plans were ever matured.

Whatever the inwardness of the move, however, the happy result has been such that our English brethren will have only themselves to blame if they now fall back into the slough of disunion and anarchy in which, if their own reports are to be believed, they have been so long.

The London Committee which has been formed is very catholic in its composition, and includes the names of such well-known men as Harold Baker, H. Walter Barnett, Alfred Ellis, and William Grove. A formidable set of rules has been formulated, setting forth, among other things, that membership will be confined to master photographers, and that a nominal payment of $1.25 annually shall make a photographer subject to all privileges and liable to all the rules. It would seem that specific arrangements have not been made for the many local bodies which are supposed to be germinating in various centres of the country; doubtless they will gradually evolve and be taken care of as the time comes. Whether the membership of the Association will become healthily large is problematical. We gather that between two and three hundred promises of membership were made before the formation of the Association. Now that it is a fact, this membership should very much increase. Every photographer whose name can be obtained from the directories has been circularised, and this general advice is to be followed up by personal canvass by enthusiasts among their local opponents. We say opponents advisedly, for in the past the British photographer has been all too eager to view "the other man" as an interloper, if not worse; and any movement of intercourse among local men is, to people understanding the English field, eloquent indication of the serious state of affairs.

The photographers are wise in their day and generation. Our confrère of THE BRITISH JOURNAL OF PHOTOGRAPHY, Mr. Thomas Bedding, has been the organizer and engineer of the Association, and the latter insist that he is too valuable to be allowed to consider his share of the active work as finished, and have appointed him Chairman of the Association. Mr. Bedding is a man not given to unconsidered statements, and assures us that there is every indication that the Association will be carried to a complete success.

We are sure that British photographers will value the sympathetic interest taken in the new Association by the leading professional journal of the United States. Since the foregoing article was written, our contemporary will be pleased to know that very great progress indeed has been made by the Professional Photographers' Association. The membership has risen to 400; the first general meeting has been held; the Executive for 1901–1902 has been elected, and committees have been appointed to deal with General Purposes and the organization of Local Branches. These committees are steadily working at matters of detail affecting the progress of the P. P. A. For example: the Local Branches Organization Sub-Committee, which was only appointed last week, has, under the energetic Secretaryship of Mr. T. C. Turner of Hull, promptly taken in hand the special business delegated to it by the principal Committee; whilst other minds are busy with the preparation of the "P. P. A. Handbook," copies of which in due course will be sent to every member for his own use and for distribution. All this detail work necessarily takes a great deal of time, and progress is perhaps not facilitated by the fact that the holiday season is in full swing. Nevertheless, not a day passes without some progress is made in the work of the Association, and we pledge ourselves to the assurance that when the members gather in General Meeting next October, the record to be presented to them will be one of useful work well done.

THE FIRST PROVINCIAL MEETING OF THE ASSOCIATION.

Meanwhile we have great pleasure in announcing that the first meeting of the Local Branches Organization Sub-Committee will take place in York on Monday evening, August 12, at 8 o'clock. The Lord Mayor of York has kindly given permission for the meeting to be held in the State Room of the Mansion House. Primarily the gathering is for the purpose of enabling the members of the Sub-Committee to confer together on the question of the establishment of local branches of the Association. The full Sub-Committee with ex-officio members consists of the following:—

The President of the Association: Mr. Thomas Bedding, F.R.P.S.
The Vice-President: Mr. H. Walter Barnett.

Messrs. Harold Baker (Birmingham).
T. Birtles (Warrington).
Gustave Mullins (Ryde).
W. D. Valentine, J.P. (Dundee).
G. W. Webster (Chester).
W. Barry (Hull).
W. Crooke (Edinburgh).
G. W. Morgan (Aberdeen).
H. C. Spink (Brighton).
H. J. Whitlock (Birmingham).

The Honorary Treasurer: Mr. William Grove.
The General Honorary Secretary: Mr. Alfred Ellis.

The Honorary Secretary of the Sub-Committee is Mr. T. C. Turner, of Regent's-terrace, Hull, who has convened the meeting at York on Monday week.

All members of the Association are invited to attend the meeting, and let the Sub-Committee have an expression of their views in regard to the establishment of Local Branches. The central position of York should secure a large attendance of members from Leeds, Hull, Scarborough, Huddersfield, Wakefield, Halifax, Bradford, Ripon, Doncaster, and other great photographic centres; nor should the smaller towns be unrepresented. It is earnestly to be hoped that the evening will not be allowed to pass off without the formation of a Branch of the Professional Photographers' Association. The opportunity is at hand for the Yorkshire centre to lead the way in this good work, and to set an example to the rest of provincial photographic England which is anxiously awaited.

But besides a large attendance of members of the Association, it is hoped that the meeting will attract many professional photographers who have not yet joined that body. We believe that the Committee would welcome their presence and give them every opportunity of learning what the aims and objects of the Association really are. As we pointed out in our article last week, the meetings of the Association that have so far taken place have had the beneficial effect of bringing into communication with each other a considerable number of professional photographers from all parts of the country who had not hitherto met. A continuance of such a policy is, we think, eminently to be desired. The oftener that professional photographers meet and discuss their common objects and interests, the more plainly will the needs of a representative body such as the Pro-

* Reprinted from "Wilson's Photographic Magazine" for July.

fessional Photographers' Association be apparent to them. But over and above the desirability of facilitating the exchange of ideas amongst individual photographers stands the necessity—nay, the urgency—of making the Association so numerically powerful that it will find itself in a position to exercise a controlling voice in the interests of the entire profession. As a correspondent writing us this week observes: "Already it would seem the best men are practically won over to a more sensible spirit of co-operation, but the trouble will be to bring in the low-class studios. They seem to view the movement with much shyness. It is, of course, hopeless to attempt to do much for these people; their ideas of making a living and a social position are pretty awful, but all the same, we must appear solid in the eyes of the public on some questions. It seems to me that the Committee have to point out the dangers that are damaging professionals. There are hundreds of men who cannot yet realise that the chief enemy is a lack of proper regard on the part of the public for the business, and it's a case of proving what unreasonably cheap prices, touting, cadging, undignified studio practice, and general quarrelsomeness among professionals have done to raise a gigantic enemy." Most heartily do we trust that the meeting at York on August 12 will take us a great step forward in the promotion of the objects of the Association.

GEOLOGICAL PHOTOGRAPHS.

[The following circular is issued by the Geological Photographs Committee of the British Association for the Advancement of Science. It appeals for geological photographs of the United Kingdom, and gives would-be contributors of them some useful directions for the taking of the photographs. Recommendations in connection with the formation of collections are also appended. We have great pleasure in bringing this valuable work to the notice of our readers.—EDS. B. J. P.]

THIS Committee was appointed by the British Association for the Advancement of Science in 1889, for the purpose of arranging for the collection, preservation, and systematic registration of photographs of geological interest in the United Kingdom.

Since its formation the Committee has been successful in obtaining a number of photographs, of which 2000 were received and registered up to the month of August, 1898, when the ninth report was presented at the Bristol meeting of the British Association.

The collection cannot yet be regarded as in any sense complete, for many districts are still poorly represented in it. A great effort is being made to fill up the numerous lacunæ.

The Committee would, therefore, urge upon geologists and photographers the desirability of further assisting the scheme, with the object of completing a national collection of photographs to illustrate the geology of our own country.

The collection has been deposited at the Museum of Practical Geology, 28, Jermyn-street, London, where it is accessible to the public for purposes of reference.

It is desired to obtain photographs, illustrative of characteristic rock exposures, especially those of a typical character or temporary nature; important boulders; localities affected by denudation, or where marked physiographical changes are or have been in operation; landslips; raised beaches; old sea-cliffs and other conspicuous instances of marine erosion; characteristic river valleys or escarpments, and the like; types of rock-structure, jointing, folding, and faulting; glacial phenomena, such as *roches moutonnées*, moraines, drums, and eskers; or any natural views of geological interest. Photographs of microscopical sections and typical hand-specimens of rocks and fossils are also admissible.

It is important that copies of photographs which have been processed for illustrating articles and papers in journals should be deposited in the collection; they should be accompanied by an exact reference to the publication, and, if possible, a copy of the plate.

Duplicate collections of about 200 prints and about 100 slides have been formed, and the Secretary will gladly forward either or both of them to any local society that contemplates joining in the work, or wishes to see what has already been done.

APPARATUS FOR GEOLOGICAL PHOTOGRAPHY.

The Committee has had under consideration the question of the most suitable form of camera for geological field work. The following is a *précis* of communications from experts who have been invited to offer suggestions on the subject:—

The *best camera* to use is probably that to which the worker is himself most accustomed. These hints are added for those who have not yet adopted any particular camera.

The camera should be as light as possible, but *rigidity* when set up is absolutely necessary.

Double swing-back and rising and falling front are essentials, to allow of correct perspective and the true rendering of lines and curves.

The camera should admit of long extension to permit the use of lenses of various *foci*.

It is sometimes desirable to take photographs of inclined or horizontal rock-surfaces at distances of a few feet, for the purpose of showing minor features, such as veins, glacial markings, structures of gneissose rocks, &c. To effect this, two boards hinged together with some arrangement for fixing them at the desired angle are all that is required. The lower board must, of course, be screwed to the stand and the upper one to the camera.

A spirit level should be used with the camera or attached to it.

It is well to have three lenses: (1) A rapid rectilinear doublet of 10 to 12-inch focus (for half-plate size); (2) a wide-angle meniscus, focal length about 6 to 7 inches, for interiors of quarries and craters; and (3) a long-focus lens of focal length equal to three or four times the length of the plate, for distant hills and inaccessible cliffs.

If only one lens is used, it should be a rapid rectilinear of about 9-inch focal length (for half-plate size), and should be by some reputable maker. It must be the best of its kind obtainable. Though films materially decrease the weight to be carried, they are not recommended for general use; plates should be used whenever possible. Good general work can be done with a quarter-plate or 5×4 camera, and subsequent enlargement on bromide paper. In this case it is essential that the lens should be of first-rate make, and be used with a small stop. For direct printing, the cold-bath platinotype method is recommended as the most permanent, and it is now very easy to work.

It is advisable, when measurements are unattainable, that a "scale object" should be included in the photograph. (A hammer is sometimes used, but it is not suitable; a walking-stick or the human figure seems to be satisfactory).

RECOMMENDATIONS FOR THE COLLECTION OF GEOLOGICAL PHOTOGRAPHS.

(1) Societies are urged to form small committees for the purpose of noting sections suitable to be photographed, and arranging such work as may be possible in each district. To this end it is anticipated that the services of many amateur photographers may be secured.

(2) Size of photograph recommended: $8\frac{1}{2} \times 6\frac{1}{2}$ inches ("whole plate"); but this is *optional*. In view of the difficulty of carrying a heavy camera and plates, it is not desired to exclude smaller views when these are well defined and clear. In the case of small negatives, when sharp, an enlargement to whole-plate size is desirable. The views should be printed by a permanent process whenever practicable. Isochromatic plates are strongly recommended.

(3) In order to preserve its scientific value, each photograph should be accompanied by *as many* of the following details *as can be conveniently given*. Forms for this purpose will be supplied on application.

(*a*) Name and position of section or locality.

(*b*) Special features shown, with illustrative diagrams when necessary. (Further details may be given, if more convenient, on a separate tracing.)

(*c*) Height and length of section, and compass direction. If possible, a scale of some kind should always be given.

(*d*) Name and address of photographer, or of the society under whose direction the view is taken,

(*e*) Date when photographed.

(*f*) Indication of direction of light and shade; *i.e.*, state whether taken in "direct light" or "in shade."

(4) Each photograph sent in for registration should bear a *local* number, and the accompanying form should be numbered at the top right-hand corner in accordance therewith.

(5) Photographs should be sent *unmounted*. This is essential in order to secure the proper geographical arrangement of the collection. They will be mounted by the Committee on cards of uniform size, with perforated edges for binding, to hold one whole-plate, two half-plate, or four quarter-plate views.

(6) Copies of photographic prints, lists of photographs, and information relative thereto, should be sent under cover to the Secretary of the Committee, at the earliest possible date, in order to facilitate the work of registration. They should be sent in *not later than August* 1 in each year.

(7) It adds very much to the usefulness of the collection when amateurs are willing to place their negatives, or copies of them, in the hands of a professional photographer, with instructions to supply prints or lantern slides, at a price, to those who apply for them. The Secretary would willingly help in giving advice on this point, as he is frequently asked where copies of the contributed prints can be obtained.

Detailed lists of photographs officially received are published in the annual reports of the Committee, which also state where the photographs may be obtained. These reports are published in the "Annual Report" of the British Association, and a copy will be forwarded to the donor of each photograph.

Further information may be obtained from the members of the Committee, or from the Secretary, W. W. Watts, Mason University College, Birmingham, to whom communications should be addressed.

[*Reduced Copy of* FORM A.]

FORM A.

BRITISH ASSOCIATION COMMITTEE ON GEOLOGICAL PHOTOGRAPHS.

Local No.*

County. Photographed under the direction of

Name and position of Locality or Section.

Special features shown

Details of Section. Height. Length. Compass Direction. Camera Pointing. "In shade" or "direct light." Time: a.m. p.m.

Sketch, or other particulars, if necessary, may be given here:—

Name of Photographer. Registered No.

Address. Date photographed.

* This number should also be placed on the back of the Photograph.

NOTE.—Copies of the above Form will be supplied on application to the Secretary, to enable Donors of Photographs to insert the requisite particulars.

NEW STANDARDS OF THE ROYAL PHOTOGRAPHIC SOCIETY.

[We are asked to state that copies of the following Recommendations of the Council of the Royal Photographic Society with reference to standard lens diaphragms, lens mounts and fittings and camera screws may be obtained on application to the Secretary of the Society at 66, Russell-square, London, W.C. An article on the subject of the Council's Recommendations will appear in the next number of the JOURNAL.—EDS. B.J.P.]

THE series of standards adopted by the Society in 1881, and modified in 1891, have been again carefully reconsidered by a committee of experts appointed by the Council. Their recommendations, which are embodied below, have been adopted by the Council, by whose orders this schedule is now published.

LENS DIAPHRAGMS.

(1) That intensity ratio be defined as dependent upon the *effective aperture*, and not upon the diameter of the diaphragm, in relation to the focal length of the lens.

(2) That effective aperture be determined in the following manner: The lens shall be focussed for parallel rays; an opaque screen shall be placed in the principal focal plane, the plate being provided, in its centre (in the axis of the lens) with a pin-hole; an illuminant shall be placed immediately behind the pin-hole, and the diameter of the beam of light emerging from the front surface of the lens shall be the measure of the effective aperture.

NOTE.—It will be found, except when the diaphragm is situated in front of the lens, that the diameter of the diaphragm itself is seldom identical with the effective aperture.

(3) That every diaphragm be marked with its true intensity ratio, as above defined, in the following order of sequence: *f*-1, *f*-1·4.., *f*-2, *f*-2·8.., *f*-4, *f*-5·6.., *f*-8, *f*-11·3.., *f*-16, *f*-22·6.., *f*-32, *f*-45·2.., *f*-64, &c., each diaphragm requiring double the exposure required by the preceding diaphragm.

Should the greatest effective aperture of a lens not conform exactly to one of the intensities set forth above, this aperture should be marked in accordance with the definition of effective aperture, but all succeeding smaller apertures should be marked in uniformity with the intensities recommended in the above sequence.

LENS MOUNTS AND FITTINGS.

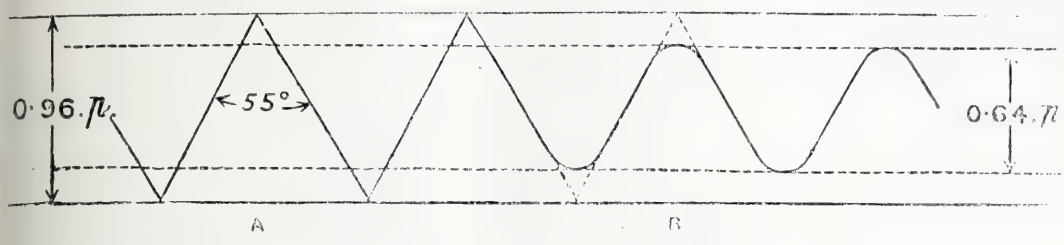
(1) That the equivalent focal length of a lens be engraved upon its mount.

(2) That the following series of screws for photographic lens flange fittings be adopted, it being understood that, in order to secure free interchangeability, every male screw should be made at least as small as these sizes, and every female screw at least as large:—

Diameter in inches.	No. of threads per inch.	Core diameter in inches.
1*	24	·9466
1·25	24	1·1966
1·5	24	1·4466
1·75	24	1·6966
2	24	1·9466
2·25	24	2·1966
2·5	24	2·4466
3	24	2·9466
3·5	12	3·3933
4	12	3·8933
5	12	4·8933
And upwards, advancing by inches.	12	

* For screws less than one inch in diameter, the Royal Microscopical Society's Standard screw should be adopted.

The Form of Thread is that known as Whitworth's Angular Thread, and is designed as follows :—



Two parallel lines, at a distance apart equal to 0·96 of the screw pitch, are intersected by lines inclined to each other at fifty-five degrees, as shown in the figure at A. One-sixth of the vertical height of the triangular spaces so obtained is rounded off both at the top and bottom, leaving the form of the screw thread as at B. The depth of this thread is 0·64 of the screw pitch. It should be understood that this is the theoretical form of the Whitworth thread, but that for the purpose of securing real interchangeability it is generally found necessary to use chasers or other threading tools which have additional prominence upon their points which come first into operation and are subject to most wear. For this purpose an addition may be made to the amount of one-tenth ($\frac{1}{10}$) of the theoretical depth of thread or to any less amount that may be sufficient.

(3) That every flange and adapter have a mark upon its front to indicate the position of the diaphragm slot or index of any lens when screwed home. The mark on any adapter should coincide with the mark upon any flange into which it is screwed. This mark should be placed at the point at which the thread becomes complete at the shoulder of the flange or adapter.

Camera Screws.

That all screws fitted to cameras either for attachment to the stand, for fixing rising fronts, or for other movable parts, be either $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, or $\frac{3}{8}$ of an inch in external diameter, and in pitch of thread and other details in accordance with the generally recognised Whitworth standards for these sizes.

NOTES ON ELEMENTARY PHOTOGRAPHIC OPTICS.

Although stenopaic photography opens up a certain field, it is insignificant when compared with photography proper, which depends primarily upon a lens, the image that is formed by it being focussed upon a sensitive plate shut off from other rays. The ordinary elementary text-book on light begins, as a rule, by saying that light travels in straight lines, and though this is of course entirely incorrect, it is necessary to assume its truthfulness—which exists under many conditions—to interpret from geometrical optics the results that are necessary for some of the photographic calculations.

Rules are frequently given in the correspondence columns of the photographic journals for enlarging and so on, none of which would be necessary if the photographer would trouble to study, even in brief, the subject which is of primary importance in his work.

The relations between equivalent and conjugate foci may be found by using a diagram (fig. 1), representing the passage of rays through

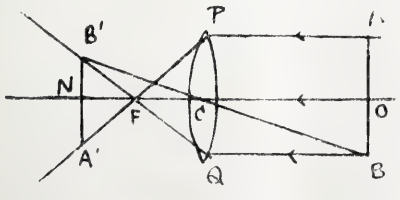


Fig. 1.

a lens. Let us assume for the moment that we are photographing a subject so distant that it, A B, may be considered at an infinite distance from the lens. Then the rays A P, B Q, are parallel, and A P is refracted through the focus F, and B Q along Q F. Now, if we join B and C, we have B C representing a normal ray, which therefore passes through the centre of the lens, and cuts Q F in B'. Therefore B' is he image of B; hence A' is the image of A; and B' A' of A B. Thus the image is inverted. Draw O C N through the centre, perpendicular to P Q, the section of the lens. Then it can be proved geometrically that the reciprocal of O C = the sum of the reciprocals of C N and the focal length. Denote these distances by u, v, and f, respectively.

Then,

$$\frac{1}{v}=\frac{1}{u}+\frac{1}{f}$$

where u and v are vector quantities, and have sign corresponding to their position relative to the lens. The magnification, that is, the ratio A' B'/A B, is obviously v/u.

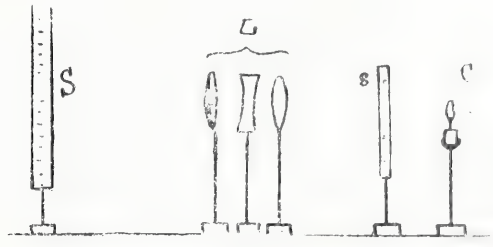


Fig. 2.

It will be seen from the above that by obtaining values for u and v, we can find the focal length of a convex lens, or indeed, of any ordinary achromatic doublet. An alternative method is to employ the spherometer, where the size of the lens renders such a method practicable; the radius of curvature is thus found, which is twice the focal length; this is only applicable in the case of single convex lenses, and would be inaccurate when spherical aberration was present.

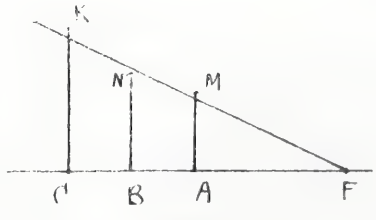


Fig. 3.

Where two or more lenses are employed, their respective focal lengths may be found, when the equivalent focus of their combination, F, will have the following connection with the foci f_1 and f_2 of the constituents :—

$$1/F=1/f_1+1/f_2.$$

A more convenient practical method is as follows. Let L be a system of lenses whose focus we require; s is a glass scale, S a large cardboard scale, and C a source of illumination. Arrange C, s and S so that the (distinct) image of s corresponds exactly with S, *i.e.*, the divisions of the image of s are the same size as the divisions on S. Now move C, s, and S till each division of the image of s corresponds to two divisions on S; let the distance between the first and second positions of S be α. Now arrange C, s and S till the magnification is 3; let the new distance be β. Plot these as follows :—A is any point on the line C F. Let A B represent α, B C = β, C D γ, &c. Draw A M one unit in length, say two inches; draw B N=2 units, C K=3 units, and so on. Join ... K N M by as straight a line as possible, which produce to cut the abscissa in F. Then A F represents unit magnification, and is therefore the focal length of the system L.

Since the seven pure colours of the spectrum have each a different refrangibility, it is clear that there will be different foci for different coloured rays. Thus, if a ray, A B (fig. 4), pass through a lens, the

"violet focus" will be at F*v*, and the red focus at F*r*, and so on. As rays at the *violet* end of the spectrum are of the greatest importance in ordinary photography, it is necessary to bring the violet, blue, and perhaps the green rays to one focus by using an achromatic or "apochromatic" combination. Suppose now we take a prism of flint



FIG. 4.

glass, having an angle, ϕ, so that the deviation for the D line produced by it is $\cdot 587\phi$, $[\delta = (\mu_D - 1)\phi]$, and another of crown glass giving a deviation of $\cdot 534\,\theta$, where θ is the angle of the prism. Then obtaining the value for dispersion from the formula $\frac{\delta h - \delta a}{\delta d} = \frac{\mu h - \mu a}{\mu d - 1}$ where δ is regarded as the mean dispersion for all rays, we find that θ is about 1.47ϕ, when the dispersive powers of the two prisms is the same. Hence the deviation of a ray through the second prism would be $\cdot 784\,\phi$. Thus, if the two prisms, one inverted, be placed together, rays will emerge deviated from their incident path, but with their colour constituents not dispersed. Lenses are theoretically made up of prisms, and hence the achromatic lens becomes possible.

We shall now proceed to a consideration of the diffraction grating. If A B C D .... (fig. 5) be the grating, where A B = B C = C D, &c. =

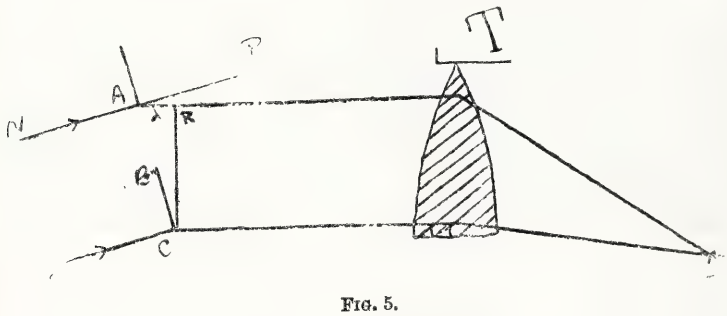


FIG. 5.

$d/2$, and any ray, N A, meet it, then all points between A and B will be centres of disturbance. Waves starting from, say, A and C will meet at F in the same phase, provided that A R is a multiple of λ, the wave-length of the light considered; C R is the perpendicular from C upon A R. If A R be not exactly some multiple of λ, then F will not be perfectly distinct; hence only a series of bright bands are visible as the telescope, T, is moved in either direction. Obviously, then, a spectrum of considerable purity is obtainable by means of the grating, and one method of colour photography at least depends on the exposure of plates to different coloured images produced by means of a grating. If the angle P A R be ϕ, A R = A C sin ϕ; hence the condition for a bright band is $n\lambda = d \sin \phi$. The value for the D line in air obtained by this means is approximately 5890.

Let us now consider a mirror P Q (fig. 6). If A be a point at a

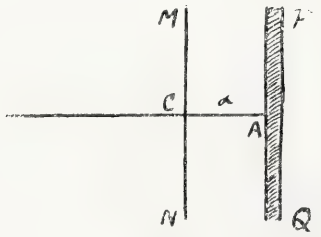


FIG. 6.

distance a from the mirror, there will be practically two sets of waves through A, one from A itself, another from reflection at C, having travelled $2a + \lambda/2$ before reaching A. Then, if

$$2a + \lambda/2 = \lambda/2\,(2n + 1),$$

there will be interference of course; therefore if $a = \lambda/2, \lambda, 3\lambda/2$ .... there will be no light in the planes M N, &c., distant a, $2a$, $3a$ .... respectively, from P Q; a is exceedingly small, and there would be several hundred planes in a film of average thickness. Now let P Q be coated with emulsion, and exposed in a camera. For a certain light of wave length λg (say from a green bush), the light will be destroyed in planes distant $\eta\lambda g/2$ from the mirror; light will exist at planes distant $\eta\lambda g/4$, and a latent image be formed in that portion of the emulsion occupied by the image of the green bush. Hence after development light of wave-length λg will be observed on such parts of the plate as were exposed to that light, since all light of other wave-length is destroyed (more or less) by interference; hence a photograph in natural colours is obtained. That is, we need hardly say, the principle on which Lippmann's process is based.

T. THORNE BAKER.

MY EXHIBITION WORK.

By A. BANK CLARKE.

[To be understood and appreciated to the full the following excellent satire on some current foibles of pictorial photography should be read in the "Practical and Junior Photographer" for August, from which excellent magazine we take the liberty of reprinting it, minus, however, some half-dozen diverting illustrations which serve admirably to point "A. Bank Clarke's" amusing text.—EDS. *B.J.P.*]

THE other day I came to the conclusion that ordinary photographs were very tame things indeed, and that if one yearned to achieve fame, and have one's name writ large in the annals of photographic art, something new and striking must be done and some rich vein of originality discovered.

These thoughts were largely aroused by the fact that it was the eve of my annual fortnight's holiday. On the morrow, instead of handling filthy lucre, or adding up columns of figures, I should be travelling rapidly to the northern seaside town where I had determined to spend most, if not all, of my time. As a photographer of several years' experience, with strong leanings towards the pictorial, a fortnight's leisure for one who had only Saturday afternoons and the usual general holidays, was naturally a most important period in my career, for then, or probably never, could my exhibition work be contrived.

The determination to excel myself and others burned in my soul. I would make the utmost of those fourteen days. I would look at things from an individual standpoint, and not through the eyes of others. Furthermore, I would so "treat" the negatives and prints on my return that the world should emphatically pronounce them decidedly original.

A feeling of elation came over me. I imagined myself reading a press opinion of my productions. It was something like this: "Mr. Clarke has appeared like a comet in our midst. In choice of subject and execution he stands out conspicuously as a man of brilliant originality. Seldom has the photographic world witnessed so numerous a collection of excellent work by one man. We hear on good authority that this versatile photographer has been invited to join the Linked Ring."

* * * * * *

My time was up. I returned to my native town, and spent several successive evenings in the dark room. I rose early to print. I stayed up late to mount. I sliced pieces off the prints, pasted them on all colours of paper in the best American style. Then I surveyed my work, and after great deliberation, resolving to be moderate, I selected six for the soon-to-be-opened Salon. Let me describe them and explain briefly the motif of each.

The first was the outcome of a brilliant idea that flashed into my brain as I sat waiting for the branch line train at Churchmanton Junction. I had seen many photographs of railway trains in motion, some said to be expresses travelling at a high speed. But none of them conveyed any sense of movement to the eye, nor did the usual custom of including the whole train commend itself to my mind. I resolved to select more judiciously than the common herd of club-men, and to grasp some of the poetry of motion which poets have described. Pursuing this intent, then, I present "The Last Train," or as you may possibly prefer to have it, "The Last of the Train." Here I flatter myself that at least two important elements in composition have been observed. The picture shows breadth (but certainly not

length) and simplicity. There is but one theme, and the motif cannot be mistaken. I offer this valuable production to any publisher, as a suitable tailpiece for a three-volume novel. My price, based on the charges of the Copyright Union, is five guineas, and I reserve the right to claim an additional sum of three guineas after publication if I find the picture has materially influenced the sale of the book.

The second picture, a figure subject, entitled "The Sand Lady," was at first intended to be a triptich. But the other two negatives having failed me, I claim that in consideration of its marvellous relief and stereoscopic effect, this little effort is worthy of praise.

Another figure subject is "The Boatman," and regarding this I do not feel that I am in the least exaggerating its merits when I say that it has been most originally "treated."

Another picture of which I am pardonably proud is "The Bathing Van." Simplicity and breadth are here again dominant features. Neither could the fine impression of force exerted by the horse be bettered, nor the graceful outlines of the van itself be rendered with greater feeling. To do justice to any subject one must be thoroughly in sympathy with it, say the books on art, a precept I put into practice by bathing from the van before I took the photograph.

But my chef d'œuvre, accomplished after many fruitless trials and much exercise of patience, is a marine picture, "The Fishing Fleet," and I offer this work of art in particular as a protest against the practice of making every photograph a stock size, determined either by the negative, or the printing paper, or the regular size of picture frame. By imparting to the scene this long narrow shape, I have cunningly contrived to rivet attention upon it merely by its unusual dimensions. At the same time, a concentration of interest is effected that entirely makes the picture the great success it undoubtedly is. Last, but not least, there is a realism about the conception—for no one seeing my picture, and afterwards the actual thing in nature, could fail to recognise that he was looking upon a genuine fishing fleet.

Now I turn to a charming architectural detail, "Study of a Lamp Post." I am not versed in the periods and styles of architecture myself, having given my leisure exclusively to art, so that I cannot quote the date and style of this particular specimen. But its graceful outline, and distinct individuality mark it for separate treatment. By an adroit adjustment of light and shade, I have succeeded in bringing the post out boldly against a lighter background, while showing at the same time, its connection with the surrounding buildings.

I must now draw your attention to my picture, "The Lonely Cot." In this case you will notice a splendid effect of perspective obtained by a well-chosen foreground, and again a marked concentration of interest secured by showing practically no object but the cottage itself, which thus becomes "Fair as a star, when only one is shining in the sky." Moreover, there is a beautiful mystery about the cot, for it is almost hidden behind a high wall, so giving play for the imagination, and in this respect it is a marked contrast to the ordinary school of photography.

I am sending these wonderful productions to the Exhibition of the Royal Photographic Society, where I quite anticipate they will be honoured with a room, or at least a bay, to themselves. If they do not receive that degree of recognition to which their exceptional merits entitle them, I shall most certainly raise an emphatic protest in the columns of the weekly press, and the judges may expect a stinging indictment.

AN AUTOMATIC PHOTOGRAPHIC MACHINE.

To a large number of photographers visiting the Glasgow International Exhibition, not the least item of interest will be the machines which are on view at various points within the grounds of the Exhibition for the taking of portraits automatically, and of which a brief notice appeared in our issue of June 14. In this one item alone, the progress made since the last exhibition in Glasgow in 1888 is strikingly displayed, for at that function an endeavour was made to exhibit a machine for the same purpose, but which could not be perfected at the time. We now, however, see the invention carried out, and in a strikingly perfect manner. The machine may be briefly described as follows (and in giving this description to our readers we desire to express our thanks for the kindness and courtesy extended to our representative by Mr. George Würtz, of Hamburg, who explained the working and everything in connection with the machine). In dimensions the structure is about six feet high by five and a half feet in length and two and a half feet in breadth, and it may be said to be divided into two separate compartments, one end being somewhat square in shape, and largely composed of metal, containing the necessary mechanism, chemicals, &c., the other end being open, and somewhat circular in shape, so as to comfortably hold one or two sitters, the walls of this compartment being lagged or fluted, and, of course, painted with a dull white pigment. About a foot and a half from the walls of the chamber where the sitters are posed a fixed stool is placed, upon which they are seated when an exposure is to be made; but by carefully posing good sitters, three heads are capable of being grouped into one picture. Entrance is gained into this part of the machine by apertures at each side; these apertures have no doors, but sitters are screened from the inquisitive public by means of dark blue curtains, which can in a moment be made to shut out all view from the outside, the roof being likewise covered in. It is merely a plain covered-in white cupboard or closet, having a fixed stool in the middle, and would appear to be detachable from the machinery portion of the structure, for the purpose of packing and transit. At a distance of about three feet in front of the posing-stool is a lens of short focus, and which, of course, is worked at a large angular aperture, for all the exposures are made by flashlight by day as well as night. To effect this a small metal box is attached to the front of the upright portion of the chamber carrying the lens, at a distance of a few inches to the side and above it, and provision is made whereby no light can strike directly into the lens except what is reflected back from the sitter and posing chamber. This little box in which the powder is burned to yield the light for an exposure is of peculiar shape, and in size about six inches by nine, into which are led two electric wires; these are connected with a small battery fixed on the ground in the rear of the chamber.

Magnesium powder is used for obtaining the light necessary, and only a very few grains are required for each exposure. Probably by reason of some admixture with the pure magnesium there appears to be a very slight amount of smoke emitted when a charge is fired; but, in any case, the two sides of the chamber being open to the atmosphere, any slight amount of smoke that is produced is at once dispelled, and there is no trouble from such. At a few inches below the light-box there is a slot cut in the face of the iron chamber, which permits of the insertion of the coin, as in all similar automatic machines. When the coin is inserted it sets the gearing of the machine in motion in a moment, uncaps the lens, an electric spark is generated in the light-box, which fires the magnesium powder, and in something like a tenth of a second the exposure is over. In conversation with Mr. Würtz we learned that dry emulsion plates were employed, the emulsion being used on thin tin sheets, similar to what is employed in tintypes. Judging from the results we have seen, we should say the machine has been very carefully constructed to yield an adequate, or more correctly speaking, correct exposure, for the examples we saw taken were particularly good specimens of the class of pictures they represent, but the matter of exposure is easily provided for by regulating the charge of powder, &c. On the sensitive paper being exposed the machine at once, by means of a number of little eccentrics and rods, sets the development in progress, and then passes the plate on to be fixed, the whole being carried through with wonderful precision and regularity, until after a lapse of about three minutes' time the picture is seen coming out of a little trough just underneath the lens, of course in a wet condition, but fixed and ready for inspection. A few minutes' wafting in the fresh air, however, soon dries the thin film of emulsion which is used. The picture is then placed in a neat little case, which terminates what must be considered a really marvellous feat in photography.

There would appear to be no difficulty in the working of the machine. When speaking to Mr. Würtz on this head, he said, "Oh, no, there is never any trouble, and any intelligent man can learn and master all details in its working in at least four days." The aim and object of the proprietors of the Bosco machine is to introduce them into all the chief centres of industry, and we understand the cost of each machine, fully equipped in every detail, is £75. Of course, each machine has to be attended by a man to regulate the conduct and properly pose the sitters, as well as to keep up the supply of chemicals, &c., but the term automatic is deservedly applied to the machine. It is not a toy in any sense, but a thoroughly practical invention, and must have entailed a large amount of thought and labour to produce.

PRACTICAL HINTS ON CARBON PRINTING.

THERE is little doubt that carbon is the most beautiful of all photographic printing processes, and also that whenever a beginner in photography, or one who for the first time sees a carbon print de-developed, that moment he becomes impressed with the operation to such an extent that he makes up his mind to try his hand and overcome this delightful printing process. For a long time there existed an idea among amateur workers that the difficulties of sensitising and drying carbon tissue were so great that the process was not one well suited for occasional use, but was more particularly adapted for profes-

sional printers. In a certain sense it must be admitted there is much truth in this statement, for no matter how beautiful and simple the process may appear to a novice, there is without doubt a vast amount of knowledge required in carbon work that can only be acquired by hard practical experience. As a rule, however, the obstacles to success in its practice do not merely lie in the sensitising and drying of the tissue as many suppose, but are rather found in what may be termed as "broadcast over the entire process," and it is when some failure crops up which to a novice in carbon work appears unaccountable, that he begins to realise the fact that the process, after all, is not quite so easy and certain of accomplishment, as many are at first inclined to believe. Although it cannot be said that the process is not one suited to the amateur worker, it is nevertheless equally true that there are such individuals in this world who are known as "carbon experts" that possess a vast amount of knowledge of this process that they have only learned by the closest application and experience, and which they take care to conceal and keep up their sleeves. This knowledge, however, generally consists in what may be termed "details of manipulation." The broad theory of the process is well known, but in the working of the carbon process it will be found that one ounce of practice is worth a ton of theory. In saying that any one can sensitise their own tissue quite as well at home as any of the large firms who make a speciality of supplying the tissue can do is perhaps not going too far, but in order to enable this being done the knowledge of how to do it is naturally implied, and this knowledge is not generally imparted in all its bearings to the public, either in the handbooks which treat on carbon work, or by those who earn their bread and cheese at it.

Take, for instance, the professional photographer who sensitises his own tissue when required for some particular job that crops up. Here we have a case where there is no need for any keeping qualities being provided in the tissue, for as soon as it is dry it is utilised in the printing frame. On the other hand, with an amateur worker it may be a considerable time will elapse before circumstances permit of his using up the tissue after its being sensitised, and although any amateur can so sensitise his tissue as to permit of its being kept (if properly stored) in good condition for a week, as a general rule, precautions are not taken at the time with this end in view. The main factor in sensitising carbon tissue so as to provide for its non-deterioration rapidly lies in the precaution of seeing that the sensitising bath is sufficiently alkaline to turn red litmus paper blue, and so storing the tissue in an air-tight receptacle as will protect it from atmospheric influences, for it is well-known to old carbon workers that, by exposing sensitised tissue to a damp atmosphere for an hour or two, its sensitiveness becomes increased, at the same time its keeping qualities become impaired. Then, again, much that has been given to the public in relation to the sensitising bath was written during the early days of collodion, and these formulæ have been handed down and copied from time to time up to the present date as if the same were quite as applicable to a gelatine negative as to a collodion film. Speaking generally, when sensitising tissue for use with a gelatine negative, the usual strength of one to twenty is much too strong for summer use, whilst in providing for transparency work a very weak bath should be employed. In the drying of the tissue it is well known that if too much time is occupied it becomes insoluble, whilst, on the other hand, if too rapidly performed reticulation sets in. Carbon workers know the value of paying particular attention to this important stage of the operation, and take care to see that the atmospheric conditions with regard to heat and moisture are suitable. It may, however, be stated that any well-ventilated room can be utilised for drying the sensitised tissue, where the temperature and other conditions permit of the drying being performed in about five hours. Another important element (too seldom given attention to in carbon work) is the temperature of the printing and developing room, as well as the idea that any makeshift arrangement will do for developing. To do this work properly the utmost system should be provided, and it is just here where an expert carbon worker shines to advantage, for by keeping his hand in he knows in a moment just what is required, and does it, and seldom resorts to the extremes a novice will adopt, such as increasing the temperature of the water in developing, when a more prolonged application of the same at a lower temperature will gain the desired end. Of the numberless dodges in carbon work performed at the development stage, perhaps one of the most useful lies in the ease with which an expert worker is enabled to increase his high lights locally without reducing the entire image. Most handbooks on carbon work give particulars how to intensify a weak carbon image, and here we have another instance of one writer copying another's production; but, as far as the writer is aware, the little dodge of how to increase or strengthen a high light in itself has never been made public in any handbook yet produced. Take, for instance, a case of development in which a portrait subject is printed in opal. By some slight overlook in printing, or it may be a general weakness in the negative, the picture on development appears somewhat flat, and such parts as white lace draperies appear muddy. After all that can be accomplished by means of local development has been resorted to, an expert worker knows the value of a broad or finely-pointed sable pencil. With these invaluable little tools in his hand he proceeds to touch up the high lights when the image is quite wet and fresh from the developing tank, and in a minute or two the most charming high lights are introduced by merely locally reducing the pigments by the springy stiff-pointed sable brush, and thus brings out a charming effect, which otherwise would be impossible of accomplishment. This little dodge is simply invaluable in cases where printing has been carried rather far, or a lack of contrast existed in the negative.

There is no doubt that the chief pitfall in carbon work, so far as the same affects a beginner, lies in the difficulty known as double transfer from a flexible support, and this difficulty alone has prevented thousands of amateur workers from regularly working this delightful process. The transference of an image from a rigid temporary support to a flexible one is easily performed. It is when the image has to be transferred from a flexible support to a rigid temporary one as a final support that failures may often occur. Hence the recommendation to employ reversed negatives where the latter operation has to be performed. Flexible supports are made use of by expert workers, and in their hands seldom give trouble; but it must be borne in mind they work with an amount of experience and under conditions that an amateur or novice seldom possesses. The preparation of the support and the care bestowed upon the drying of the developed image in its different stages, along with all the perfect condition of all the materials employed, are the sole factors which enable double-transfer work to be successfully performed, and it is just about ten to one that any novice attempting double-transfer work without the necessary experience and proper facilities for performing the same is sure to come to grief in this operation, and therefore it is well at the very outset that such realise the fact that double-transfer work from flexible to rigid final supports is not easy of accomplishment, and is just a case in point requiring special knowledge by expert workers. On the other hand, there is no reason why any beginner should stumble seriously over double-transfer when such is performed from a rigid to a flexible support, and after some experience in this he will find himself gradually picking up information that can only be learned by practice until he may be able to tackle the more difficult operation of transferring the carbon image from a temporary flexible support to a rigid final one. It may be said at once that the sheet-anchor for a novice in double-transfer lies in the employment of a good sample of enamel collodion as an intermediate stripping film. This is applied to any suitable rigid support, such as a polished sheet of plate-glass, or opal, or zinc. For a beginner opal is perhaps the most suitable, as it enables the operation of development to be more easily followed. Of course, where collodion is employed as a stripping medium the surface of the temporary support must be prepared by means of French chalk in the case of glass, or waxing solution where matt surfaces are concerned, and provision must likewise be made for the edges of the support preventing the collodion film from frilling or slipping during development. This is easily provided by means of a band of albumen being run round the edges of the support with the aid of a camel's-hair brush.

There is, however, a little dodge sometimes available, in which an ordinary negative may be made to yield a true image picture by means of single transfer only. To effect this simple operation the carbon image is developed as if for single transfer only on a sheet of absolutely flawless glass, such as patent plate. The surface of the glass receives a thin coating of gelatine, in which is incorporated a small portion of chrome alum. This may be termed a substratum only in contradistinction to a film. When applied to the surface of the glass the same is exposed to the light until quite dry. This causes the invisible substratum to become insoluble, but permits of the carbon image adhering to its surface during the operation of development with great tenacity. The image is developed in the ordinary way, and when examined through the glass, of course, appears in its true or non-reversed position. It therefore only remains to apply some suitable backing to the carbon image, whereby the high lights and half-tones are made to appear in proper form, thus yielding one of the most permanent pictures possible of accomplishment, and many exhibition pictures where double-transfer and reversed negatives were not available have been produced by this means, and it is quite surprising more attention is not bestowed upon this simple method of producing true carbon images by means of single transfer only. In carbon work, no doubt, the obtaining of reversed negatives for special purposes plays an important part, and where large numbers of proofs are required from one negative or subject it is perhaps the most practical means of undertaking such work. The production of reversed negatives for carbon work calls for no special remark; there are so many different methods that may be employed, and which are well known, that an operator can choose the one he is best acquainted with. This may mean producing a reversed negative of the same size exactly by placing a sensitive gelatino-bromide plate in contact with the negative, and printing a reversed negative by development straightaway. This is quite a practical method to employ without employing a transparency at all, the latter only being required in cases where reduction or enlargement is required. The main factor to success in

carbon work in all its branches lies in the one word "application," or being regularly in touch with it, and having all necessary apparatus for its proper performance. All makeshift arrangements lead to failure.

A. T. NEWTON.

Our Editorial Table.

THE "BERTHA" REVIVER.

Manufactured by the Vanguard Manufacturing Company, Maidenhead.

THIS preparation is especially intended for the renovation of the black leather, or imitation leather, coverings of hand cameras, &c. The directions are:—Use a small piece of sponge to apply the reviver, being sure to cover thinly all parts of the surface. Then polish with a piece of soft rag or a polishing brush. Following the instructions, we applied some of the reviver to a black leather camera case, the pristine lustre of which had been considerably dimmed by constant use. The result is that our old case once more presents a respectable appearance. Doubtless, the preparation will prove to have a much more extended field of usefulness than that for which it was specifically intended.

A FOLDING FILM CAMERA.

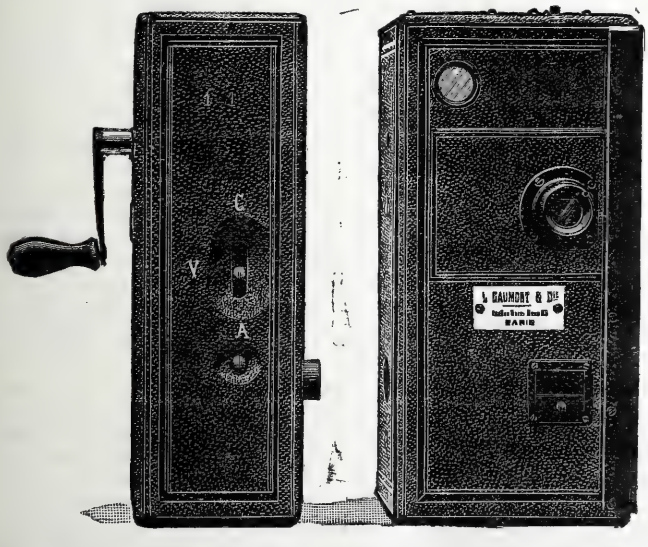
Manufactured by Hobbies, Ltd., 12, Paternoster-square, E.C.

WHEN folded for carrying, this camera presents the appearance of a box, whose dimensions are $7\times4\frac{1}{4}\times2\frac{1}{4}$ inches, neatly covered in black leather, and with nickel-plated fittings. For use, the front board is let down, and spring catches hold it in position; the camera front is pulled forward, a latch holding it; the fine adjustment is made with a screw focussing arrangement, a scale and pointer indicating the correct position for various distances. The lens is a single achromatic, fitted with rotating diaphragms. The shutter is adjustable for time or instantaneous exposures, three speeds being provided for, and a finder is part of the equipment. Rollable film is used, and the pictures are $3\frac{1}{2}$ inches square. The same firm supply daylight cartridges, and all photographic accessories for use with the camera.

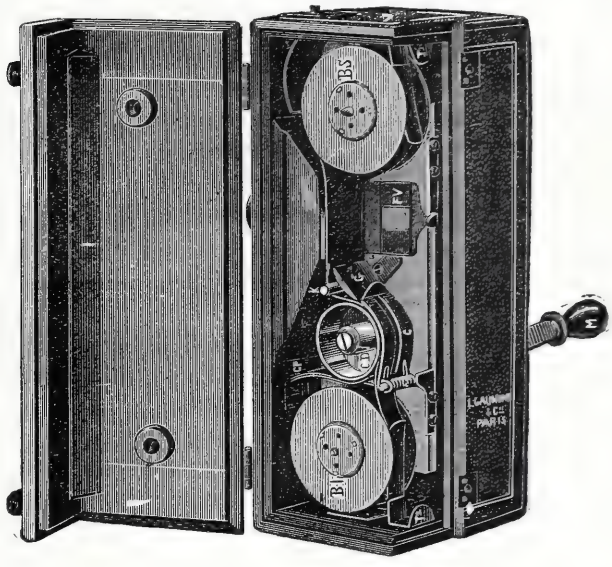
THE POCKET CHRONO.

Manufactured by L. Gaumont and Co., 25, Cecil-court, Charing Cross-road, W.C.

ALTHOUGH it would require rather a large pocket to contain this instrument with any comfort to the wearer of the coat, we suppose we must concede that the title Messrs. L. Gaumont and Co. have given to their miniature cinematograph apparatus is not an inappropriate one. The



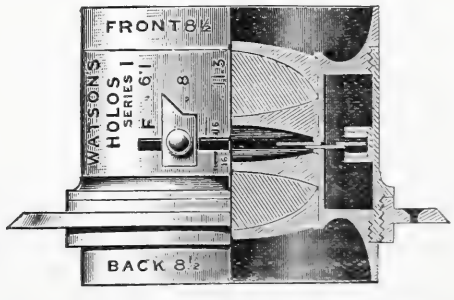
pocket chrono is in the form of a leather-covered box, and is, to use their own expression, about the size of a box of dominoes. The mechanical principle is the same as in the original "Chronos," but the mechanism has been simplified, and both bulk and cost have been saved thereby. We will not attempt to describe the working details of the instrument, for, although the mechanism seems to us as simple as such can possibly be to perform the intricate operations incidental to the successive exposures required to form a cinematograph film, it is by no means easy to give an intelligible account of them in the brief space available. Suffice it to say that, with no other instructions than those accompanying the apparatus, we found no difficulty in working the instrument. The motive power may be supplied by turning a handle by hand, but to ensure regular motion a motor of some kind is preferable. The clockwork motor constructed for use with the apparatus seems to answer its purpose admirably. It is made so as to be easily attached to and detached from the cinematographic camera, and, although the bulk of the apparatus is thereby doubled, the whole does not exceed in dimensions many quarter-plate hand cameras. The motor is arranged so that either the film will run its length without attention, or so that the exposure may be stopped at any point, and resumed at will. The pictures are approximately 9-16×3-8 of an inch each, and the film is supplied on spools for daylight loading in lengths



for 500 pictures and upwards. A special frame is supplied which makes the work of development, &c., very simple. The same apparatus is employed for the printing of the transparency films from the negatives, and also for the projection of the pictures on a screen, and for this latter purpose attachment is made of a specially designed lantern to carry the illuminant, which may be oil, incandescent gas, acetylene, lime, or electric light. The working instructions are lucidly written; we had no difficulty at all in following them. The pamphlet also contains a price list of accessories of all kinds, and of transparency films of various subjects.

THE HOLOSTIGMAT CONVERTIBLE LENS

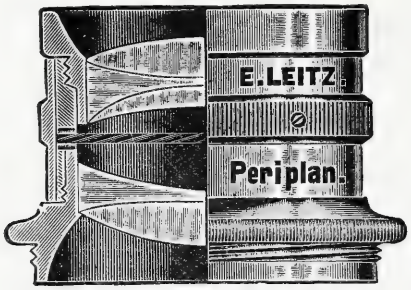
MESSRS. Watson and Sons, 313, High Holborn, London, have submitted to us for trial a specimen of the new lens they have introduced under this name. The series may be described as one of the symmetrical type, offering facilities for combination with components of longer and shorter focus, and with the advantage that each component may be used as a single lens at full aperture. The series ranges



in focus as doublets from 4 to 12 inches, covering plates from 4×3 to 12×10 at full aperture, but the separate components have a range of focus from 6 to $20\frac{1}{2}$ inches. The doublets have a rapidity of *f*-6 and *f*-6.5, according to combination, and the single lenses work at *f*-11.5. The specimen we tried was formed of the foci $12\frac{1}{4}$ and $10\frac{1}{4}$ inches, which together formed a doublet of $6\frac{1}{2}$ inches focus, and aperture *f*-6.5. Both the doublet and single lenses are capable of fine definition at full aperture, and the field is very flat. For a distant object the slight curvature does not exceed 1-16 inch on a $7\frac{1}{2}\times5$ plate, which is a size rather larger than given in Messrs. Watson's list. We are unable to give particulars of the construction of the single lenses, as they are not set out in Messrs. Watson's list, but we may describe the instrument as a very satisfactory one, whether used as a doublet, or in the form of single lenses, and, being of the convertible type, the unsymmetrical combinations place three foci at the photographer's command.

The Periplan.

Messrs. Watson and Sons have also favoured us for inspection with a specimen of this new lens, made by the well-known optician, E. Leitz, of Wetzlar. The lens is of unsymmetrical construction, being formed of a triple-cemented front combination and a double-cemented back combination. The construction, at first sight, suggests the well-known Zeiss Series IIa reversed, but closer inspection will show that the cemented double combination is formed of a crossed negative cemented to a crossed positive, whereas the corresponding Zeiss component is formed of a positive meniscus cemented to a negative meniscus.



By reference to the patent specification published in The British Journal of Photography, April 28, 1899, page 265, it will also be seen that the glasses differ in their nature and arrangement. The sizes now offered vary in focus from 90 to 400 mm., covering plates from 4×3 to 15×12 inches at full aperture, *f*-8. The lens we tried was of 210 mm. focus, and at *f*-8 we found the definition very good, and evenly distributed over a flat field. The illumination is also very even. The lens is anastigmatic and rectilinear, and, as it covers an angle of 90° with a small stop, it should prove a very useful instrument for general work.

News and Notes.

Exhibition of Historical and Architectural Photographs.—In the Journal of last week we published a short article on this Exhibition. We regret that by inadvertence we omitted to credit the "Times" with the article.

Blairgowrie and Rattray Horticultural Society's Exhibition.—The following are the awards in the photographic section:—Silver medal, J. C. Varty Smith, Penrith, Cumberland; bronze medal, D. G. Monair, Blairgowrie. The medals were subscribed for by the Blairgowrie and District Photographic Association.

We have received the following from a reliable firm: that a foreigner, speaking fair English, is representing himself as agent for a firm in Brussels, who are making new transparent colours for lantern slides. The examples shown were most satisfactory, but the colours furnished proved utterly useless, and as such we think it right to advise others to test before purchasing.

A new edition of the Great Eastern Railway Company's "Tourist Guide to the Continent" has been issued. Among its fresh features are particulars of the new tours in the Tyrol, express services to Norway, Denmark, and Sweden, via the Royal Mail Harwich-Hook of Holland route; of new tours in the Luther Country, and Thuringian and Hartz Mountains, a series of Continental maps, and a chapter. "Dull Useful Information," giving particulars as to the cost of Continental travel.

The Duc d'Orleans' Photography. — According to the Paris correspondent of the "Standard," the Duc d'Orleans has been interviewed by a representative of the "Gaulois." At their interview, says the correspondent, the French Army and Navy were overwhelmed with fulsome praise, and in conclusion the Duc told his interlocutor that his love of France was so intense, that one of the greatest pleasures he had in his exile was to contemplate the photographs of the French coast taken by himself whenever in his yacht he came in sight of it. The photograph shown to the representative of the "Gaulois" was so indistinct that he confessed to the Duc d'Orleans that he was not a sufficiently good courtier to pretend that he could make out anything but a vague line. This does not say much for the Duc's photography, unless it is claimed for it that it is of the impressionist school.

In a letter which appears in the "Magazine of Art" Mr. Frith, R.A., asks for information concerning the present whereabouts of "The Merry Wives of Windsor," a picture which he exhibited in the Academy of 1843, which was sold soon afterwards at Liverpool, and which he has not since seen. The letter is printed by the side of a small reproduction of a photograph of the picture, and some will doubtless wonder how Mr. Frith obtained a photograph of a work that he has lost sight of for fifty-eight years. The block in the "Magazine of Art" was, as a matter of fact, made from a photograph obtained from a Daguerreotype of the picture taken before it was sent to the Academy in 1843. The Daguerreotype was so faded and blurred by age that it was difficult to make out the subject of the picture, yet a well-known London photographer to whom the artist sent it a few months ago managed to produce from it a print as clear and well defined as many modern photographs of oil paintings.

Old Portrait Negatives.—A correspondent calls our attention to the fact that, in the article last week on estimating the value of a photographic business, we made no allusion to stock negatives. Our reason for not doing so was because it is a very wide question. At one time a stock of, say, 20,000 negatives was looked upon as being of quite different value from what a similar number is now. At that period people did not sit so frequently as they do now. Then, when a portrait was taken it served for a long time, copies being ordered from the negatives as they were required. Now that fashions are so continually changing, the majority of people prefer to sit afresh when more portraits are required, rather than ordering from the old negatives. Except in the case of death, we doubt if negatives, in many instances, pay for their storage after they are a year or two old, more especially in the lower-priced businesses. In higher class ones, or where the negatives are of public characters, the case, of course, is different. In one case a large stock of negatives may be a valuable asset, in another they may be of little value.

Kodak Amateur Photographic Competition.—The Kodak Company announces a new competition for amateur photographers who use a Kodak, and as an inducement to enter the lists 105 valuable prizes are offered, amounting to £300. The competition is to be on somewhat similar lines to the Kodak Competition of 1897, when a very successful exhibition of pictures was held in the New Gallery, Regent-street, W., an admirable show that taught a lot of people how very simple modern photography with a Kodak really is. There will be no entrance fee whatever for this new competition, and the only condition is that the negatives shall be made with a Kodak on Kodak film, and the picture printed on paper manufactured by Kodak, Limited. The exposure must be made by the competitor, but it is not necessary that the finishing of the picture should be the work of the competitor. The competition is to be divided into three classes:—Class A, for pictures from negatives 3½×3½ (No. 2 size), and under; Class B, for pictures from negatives larger than 3½×3½; Class C, for enlargements any size from any size negatives. Exhibits must be sent in not later than November 30, 1901, addressed to "Amateur Competition," Kodak, Ltd., 43, Clerkenwell-road, London, E.C. The pictures sent in will be exhibited in London at the new Kodak Gallery, 40, West Strand, W.C., where the Company are now holding a free exhibition of war and other pictures. Prospectuses of the competition may be had of any photographic dealer, or direct from the Kodak Co.

The King's Portrait in India.—A correspondent of the "Times" writes to that journal:—"In order to familiarise the people of India with the features of His Majesty the King and to symbolise the fact that all authority, judicial and executive, is exercised in his name, the Government of India have decided to provide all official residences and buildings with 'suitable' likenesses of His Majesty. In due course the coins of the realm will bear his impress, but it will take a very long time for the new coins to gain general currency outside the ports and few large cities of India, and in rural tracts many of the people are so poor that they live largely by barter, and seldom have in use other than small copper coins. It is intended to have the portraits of three classes, the first to be three-quarters length in oils, costing from £50 to £75 each, and to be placed in the official residences of the heads of Governments and local administrations, the chief Courts of Justice of the different provinces, and all large buildings in which durbars are held by a representative of His Majesty. The second class of portraits, also in oils, are to cost from £30 to £50 (and will be placed in the official residences of Political Agents and Residents in Native States and in the durbar rooms of such States. Lastly, all the ordinary Courts and kacheris throughout the Indian Empire will be provided with coloured lithographs or engravings of His Majesty. The details of the scheme are still under consideration, but its principal features will remain as above indicated. It is pointed out that to duly impress the populace the portraits should represent the King in robes of State or in Field-Marshal's uniform, since the conception of an Emperor in the attire of a private gentleman is foreign to them."

"Why is it that a professional photographer who caters for amateurs is such a difficult man to get on with?" asks "Half-Tone" in the "Oxford Times." "Often when travelling I have wanted to change plates or develop one or two to see how I was getting on, and I have gone into a professional's establishment, which provided a dark room for tourists, but I have nearly always had to submit either to a dissertation on how simple it is for an amateur to take the bread out of the professional's mouth, or to a long explanation of how the last amateur mixed his (the professional's) hypo with the developer, and therefore he could not let his room for developing again. This sort of thing seems a great pity, for surely in a seaside resort or a show town a dark room for tourists ought to bring in a nice little addition to the yearly revenue, if properly managed, and there ought not to be any need for the proprietor to tell a customer how long it took his boy to clear up the dark room after the last amateur had visited it. If the customer is a raw amateur, such remarks only make him angry and do no good, while if he is something more—perchance a brother professional—the remarks make him laugh, consider the owner of the dark room a fool, and take care not to go there again if he can help it. I don't mean for a moment to suggest that dark rooms are not shamefully misused by some tourists, but a photographer must be rather foolish who does not anticipate that;

before he decides to let his room he should prepare it accordingly. He should take care not to leave large quantities of developer and hypo within reach, and should serve his customer only with the amount of developer, &c., that they propose to use and are prepared to pay for. That the thing can be done well is proved by the way in which many chemists and photographic dealers cater for the wandering photographer. Of course, there is no obligation for the professional to run a public dark room at all, but I do think that when he professes to do so he should do it properly."

PHOTOGRAPHY at the St. Louis World's Fair of 1903.—Mr. J. C. Strauss, the well-known photographer, of St. Louis, makes the following excellent suggestion with reference to the exhibit of photography at the World's Fair of 1903:—"Have a pavilion devoted exclusively to pictures produced by photography, whether made by amateur or professional photographers, provided same give evidence of artistic feeling. The universality of the camera has caused nearly every person in the more enlightened countries to have a lively interest in photographic productions. Heretofore only limited space, usually in a building devoted to manufactured products, was given to photography. In recent years portraiture by photography has successfully invaded art realms and commanded recognition by art critics as being far above and beyond the mechanical in processes and in results. The display of pictures should be along salon lines—that is to say, only such pictures should be exhibited as are considered worthy by a competent committee of artists (not photographers), no distinction to be made between amateurs and professionals. The detail and clerical work of giving this feature the widest and most general publicity would be conducted by the photographers of this country. Through their efforts in arousing the interest of their fellow-craftsmen, both by direct communication and through the medium of periodicals devoted to photography, the St. Louis World's Fair would become advertised in every town of any consequence on the globe and gain the enthusiastic support of more individuals (amateur photographers) than would result from any other contemplated display. In connection with the feature here suggested, an effort would be made to raise funds with which to commission some sculptor to make a figure in plaster of Daguerre, the father of photography, to be placed in this pavilion. Later on this should be cast in bronze, appropriately placed, to become one of the city's permanent adornments in statuary. Should the ideas here suggested receive any encouragement from yourself and the directors, I should like to hear from you at the earliest moment, so that I might place the subject properly before the Convention of the Photographers' Association of America, which meets at Detroit early in August, and would also endeavour to have their Convention of 1903 meet in St. Louis."

Commercial & Legal Intelligence.

THE Directors of Thorn and Hoddle Acetylene Co., Ltd., have declared an interim dividend for the past half-year at the rate of 6 per cent. per annum, against 5 per cent. for the corresponding period of 1900.

MR. Wilfred Emery writes: "Owing to the disposal of the lease of my premises at 3, Soho-street, W., I have closed my office at that address, and shall in future conduct my business entirely at Cricklewood. In addition to the works in Anson-road, I have opened an office and show rooms in the High-road, Cricklewood, to which all letters, etc., should in future be addressed."

THE Brighton Photographic Company, of 57 and 58, Clarence-square, Brighton, have sent us a copy of their current list of prices for photographic work of various kinds. Turning over its pages, we find that the company charge moderate prices for their work, and undertake the making of enlargements in carbon, platinotype, or bromide negatives from prints or negatives, lantern and other transparencies, half-tone blocks, and ivory miniatures; printing in silver, platinum, &c.; retouching, finishing in black and white, oil or water colours, painting, also come within the scope of their business, and in addition they are prepared to supply frames and mounts. We note, too, that they are the proprietors of the "Brighton" series of cloud negatives, which are made either on film or glass.

WYNDHAM AND CO.'S Annual Outing. — The employees of Messrs. Wyndham and Co., Ltd., Collotype Printers and Publishers, Acton, London, W., held their annual beanfeast on Saturday, July 20, and were favoured with most brilliant and enjoyable weather. The party, consisting of about 50, assembled at the works and proceeded in char-a-bancs by a well-chosen route, winding through country lanes and picturesque scenery, to Denham, where an al-fresco luncheon was partaken of in the beautiful woods there. Afterwards the party journeyed on to Chalfont St. Peter's, where, in the sylvan groves at the Wheatleys, the remainder of the day was spent. Here a large marquee had been erected in the cherry orchard, where a sumptuous repast was served. After justice had been done to the good things provided, Mr. Taylor, the managing director, who was in the chair, proposed "Success and prosperity to the firm of Wyndham and Co., Ltd." In the course of his remarks he alluded to the progress which the company had made since their last outing, and called attention to the fact that since that gathering two other departments had been added to the establishment, and also to the further increase of machinery and plant which had enabled the staff to turn out the work in an even more satisfactory manner than heretofore. The directors were now considering a scheme to open a further department, and to make other arrangements to effect an even more expeditious output in the future. Mr. Taylor added, "It must indeed be gratifying to all that the party has been so fortunate in being favoured with such beautiful weather for their holiday, and it was indeed a welcome change and relaxation to the staff after so many weeks of working overtime, which had been a severe strain upon all, and he assured them their efforts had been duly appreciated, not only by the directors, but by the customers also, who had placed such a quantity of orders which necessitated so much overtime being worked. These facts alone prove that your efforts have gained the full confidence and approbation of our customers, and so long as you put forth your best individual efforts, so will the firm prosper, and with their prosperity yours also; and, as years roll on, we may expect these gatherings to be supported by larger numbers." Mr. Taylor concluded by saying, "Unfortunately circumstances prevented the whole of the staff being present, as some of their representatives were away in different parts of the country, but we are pleased to welcome in our midst our representative for Scotland and Ireland (Mr. P. Hyland, of Edinburgh)," and called upon that gentleman to respond, which he did in a most racy and amusing manner. Games and other amusements were then entered into with great gusto by the whole of the party, and after tea the journey homewards was made in the cool of the evening, and on the dispersal the party were of an unanimous opinion that the outing had been a phenomenal success.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
5	Croydon Microscopical	Excursion: Guildford and neighbourhood. Conductor, J. H. Baldock.
10.....	Borough Polytechnic.....	Excursion: Wanstead Park. Leader, M. J. Lindsey.
10.....	Hull	Excursion: Lowthorpe, Brace Bridge, and Harpham.
10.....	South Manchester	Excursion: Rostherne. Leader, J. R. Gibbs.
10.....	Thornton Heath	Excursion: Woolwich, by steamboat.
10.....	Walthamstow Photo.....	Excursion: A City Company's Hall.

Patent News.

THE following applications for Patents were made between July 15 and July 20, 1901:—

ROLLABLE FILM DEVELOPMENT.—No. 14,412. "Receptacle for the Treatment of Rolled Films in the Development and like Processes." Complete specification. SALLY JAFFÉ.

PHOTOGRAPHY.—No. 14,510. "An Improved Method of Photography and Apparatus therefor." Complete specification. LOUIS DREYFUS.

SHUTTERS.—No. 14,621. "Improvements in the Governing of the Movements of Photographic Shutters and in Adjustable Supports for Drawing-boards." Complete specification. HENRY JAMES SPRATT, ALFRED SIDNEY SPRATT, and GEORGE ALBERT SPRATT.

SHUTTERS.—No. 14,754. "Improvements in Photographic Shutters." JOHN HARRINGTON.

FILM HOLDER.—No. 14,772. "An Apparatus for holding Cut Photographic Films in Dark Slides." ROBERT JOHN HILLIER.

SPOOLS.—No. 14 802. "Improvements in Spools for Photographic Films and Papers." CHARLES FREDERICK SEYMOUR ROTHWELL.

PHOTOGRAPHS REGISTERED:—

W. Jeffery, 27, Holmeside, Sunderland. *Photograph of return of local volunteers.*

Catherine Edmonds, 118, Westbourne-grove, W. *Photograph entitled "Thinking."*

B. Wilson and A. Hargrave, 5, Worcester-place, Oxford. *Two photographs of views of Oxford.*

L. B. Bradshaw, 6, Finch-road, Douglas, Isle of Man. *Photograph of the late Miss E. Carlisle.*

L. Berry and R. G. Berry, 27, Chapel-street, Chorley. *Photograph of drawing of Chorley Parish Church in 1850.*

J. W. Dale, Wellington House Studio, Victoria-road, W. Hartlepool. *Photograph of Christ Church, W. Hartlepool.*

P. Charleton, Garrison Studio, Newbridge, co. Kildare. *Photograph of sketch entitled "Pre-historic Practice at Glen Imaal."*

A. Wildman, The Maybury Studio, Maybury-road, Woking, Surrey. *Two photographs of Major-General R. S. S. Baden-Powell, C.B.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

ADDRESS WANTED.—S. A. BEST writes: "Will you kindly give me the address of Professor Burton? Is he still in Japan?"—In reply: Professor Burton died in Japan two years ago.

THE VENUS BUST.—S. W. W. writes: "Will you inform me where I can buy a life-size Venus bust for practising light and shade, also price for the above bust?"—In reply: We believe that Messrs. Dawbarn and Ward, Farringdon-avenue, London, supply the bust.

COLOURING PHOTOGRAPHS.—"REX" writes: "Will you please let me know where I can get photographs coloured?"—In reply: If you consult the advertisement columns of the JOURNAL you will find the addresses of several who colour photographs.

SPOTTING COLLODIO-CHLORIDE PRINTS.—H. B. asks: "What medium should be employed in spotting glossy and matt prints?"—In reply: The Vanguard Company sell a special medium for the purpose, we believe. But ordinary water colours may be used, with the addition of gum water where required.

J. J.—We cannot locate the cause of the spots on such meagre data, or rather no data at all, beyond saying that they are due to extraneous matter coming in contact with the surface of the print, which have reduced the silver by contact. A probable cause is metallic particles in the washing waters.

ADDRESS WANTED.—B. L. E. writes: "Will you please give me in your next JOURNAL the name and address of the principal photographic portable studio builder?"—In reply: We are not aware that there is any principal studio builder. Messrs. Walton and Co., Muskham, Newark, make a speciality of portable studios. Write to them.

ADDRESS WANTED.—"OXON" writes: "Can you oblige me with the address of the Secretary to the Royal Warrant Holders' Association?"—In reply: For the moment we do not remember the precise address, but a letter addressed to the Association of Royal Warrant Holders, Ltd., London, will suffice.

"JUSTICE."—You can only proceed against the man in the County Court for what amount may be due to you. If the portrait was a free gift—given unconditionally—so far as we can see he can make what use he likes of it. Had the man been paid a salary as well as commission the case would be different. The troubles with mounting of the opalines will disappear if a little more care be used. See that the corners are well covered with the cement, and that no air is left imprisoned between the glass and the print.

COVERING POWERS OF LENSES.—J. G. asks: "Whether a whole-plate lens should cover whole-plate sharp to corners without stopping down, as he gave about £3 3s. for them; if not, what size of plate should cover sharp open?"—In reply: If the so-called "whole-plate" lens is of the old-fashioned type, as from its price we assume it is, it probably will not cover that size with its full aperture. What size it will cover it is impossible for us to say without testing it. All must depend upon the quality of the instrument.

SALARIES.—"NEMO" asks: "(1) What would you consider a fair salary for me to pay my daughter (who, of course, lives at home with us) for her services? She is 20 years old to-day, and is able to take charge of studio (i.e., operate), print in velox, &c., &c. (2) Ditto ditto my wife's sister, age 41, who manages, looks after orders, negatives, &c.; also lives in?"—In reply: We must confess that these are two queries we are unable to answer. All must, necessarily, depend upon the ladies' abilities in their respective spheres. Of those we are, of course, unable to form any judgment whatever.

THE DETENTION OF SPECIMEN PRINTS.—"WAITING" writes: "On the 19th inst. I sent the editor of —— two somewhat curious prints of a snapshot I took, asking whether he would care to purchase same for reproduction in the magazine I have named, and at same time I enclosed stamped envelope for return of prints, if not required. I may as well state there was nothing wrong about the photographs. On the 24th inst., not having had any reply to my letter, I wrote again to ask if my letter and the photos had been received, but up to date (30th) no reply has been received by me to either of my letters, and I am therefore left in ignorance as to whether either of my letters reached their destination or not. What ought one to do in such a case?"—In reply: "A fellow-feeling makes us wondrous kind." While sympathising with our correspondent, we can quite believe that the editor in question has hardly had time to make up his mind about the prints submitted. We advise a little more patience, and no doubt our correspondent will learn the fate of his prints in due course.

LENS QUERY.—J. MIDDLETON writes: "I require a lens for all branches of photography, to take 10×8 open aperture. Could you kindly advise me which of the following two would be best:—Dallmeyer's stigmatic series II., working aperture f-6, or C. P. Goerz double anastigmat, series III., working aperture f-6.8? Which is the most rapid? or any other maker's lens you could recommend?—In reply: Either of the lenses named is excellent, but if you wish to work with full aperture we should recommend you to have one catalogued for the 12×10 size. The first-named lens having a somewhat larger aperture than the other, will be the quicker of the two.

GROUND GLASS.—R. STEVENSON writes: "Should be glad if you would please let me know how glass is ground on one surface by being exposed to the fumes of some chemicals? What chemicals I do not know. I once read how to do this in your paper, but cannot now find it."—In reply: Thoroughly clean the glass, and suspend it (horizontally) over a tray containing hydrofluoric acid until the surface is sufficiently greyed. The vessel must not be of glass or earthenware, as that would be acted upon by the acid. An ebonite or vulcanite tray is suitable. Avoid inhaling the fumes of the acid, as they are injurious. Also avoid contact with it on the skin or nails.

PHOTOGRAPHERS' CHARGES.—"A SUBSCRIBER" writes: "I photographed several signatures for the enclosed company to send to the Houses of Parliament, as proofs of signatures, to get their Bill through The sheets did not come in together, but a few at a time, and in very dull and foggy weather, and spread over several weeks. There were 41 negatives (12×10), four sheets on a negative, when all were set up. They had proofs, and ordered six copies from each, to be mounted, and bound in six volumes. I charged 10s. per negative, and 3s. per copy; this included setting up, mounting, and book-binding, in morocco. I had a cheque for half the account, and was promised the remainder, with some more work, shortly. I have not had the balance, or any more work, but have been promised. Do you think I have charged too much? Several influential photographers say the charge is reasonable."—In reply: We also consider the charges very reasonable, and there is little doubt the company will pay in due course. Anyhow, you might very well write for the balance, when you will probably receive a cheque.

DEVELOPMENT OF CINEMATOGRAPH FILMS.—"CINEMATOGRAPH OPERATOR" writes: "Can you kindly tell me in your answers to correspondents the cause of the red stains on enclosed film. I handle a large quantity every day, and have only had this trouble lately. It never appears on negative film, and is only found on about one film in three or four, generally only slightly, the specimen sent being the worst I have had. The following details may assist:—Developer: Hydroquinone, alkali, caustic soda. Hypo bath is acid, and both developer and fixing perfectly fresh and colourless. Every care is taken to prevent contamination of baths or water used for rinsing films after developing. Temperature of dark room, 68° F.; never above 70° F. I have tried everything I can think of to produce the stain at will, but can never succeed. It is only when not required that it appears. All the dishes and tanks are lead-lined, and perfectly clean. I have had 600 feet of this in one day, so trust you will be able to assist."—In reply: As it is only occasionally that the stains appear, they can only be attributed to the manipulation, supposing the same brand of films be always used. Possibly the vessels used were not absolutely clean on all occasions? If that is not the cause, we should suggest a more complete washing between development and fixing, and the employment of a fresh fixing bath each day.

SMASHED NEGATIVES.—E. CUZNER writes: "Just over a month ago I sent a valuable 12×10 negative to a firm of enlargers to be enlarged, insuring same, and instructing them to insure it when returning. On my opening box I found negative was literally smashed to atoms. A registration fee had been paid to insure its safety; but on my claiming damages, I was informed that the Postmaster-General is unable to entertain my claim, as compensation is only given where there is clear proof of negligence or rough usage in the post, and, after inquiry, nothing has been discovered to lead to the supposition that the parcel was not treated with proper care. Will you kindly advise me if I could recover compensation? It seems to me that the fact of having accepted a registration fee makes the Post Office authorities liable for the amount negative was insured for?"—In reply: We publish you letter, though we fear you will not be able to enforce your claim. If you purchase the Post Office Handbook, price one penny, you will see that the authorities cover themselves under a number of conditions. Amongst others, is one that all applications for compensation should be made on the proper form within seven days after the date of posting. Did you fulfil that condition? If you can prove that the package was posted uninjured, and was received damaged, it is proof that it was damaged in transit. Write direct to the Postmaster-General, St. Martin's-le-Grand, E.C. When parcels of this kind are received it is always well to open them in the presence of the postman.

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EX CATHEDRÂ.

The York Meeting of the Professional Photographers' Association.

We announced last week that the first meeting of the Local Branches Organization Sub-Committee of the Professional Photographers' Association would take place at York on Monday, August 12. The following card of invitation has been officially addressed to the whole of the Yorkshire photographers, to the number of about 300:—

8, Regent's-terrace,
Hull.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Dear Sir,

A Meeting will be held in York, *on* Monday Evening, August 12, *at* 6 o'clock. *The Right Hon. the Lord Mayor of York (Alderman W. Purnell) has very kindly placed the State Room of the Mansion House at the disposal of the Provincial Sub-Committee, and a large attendance of Yorkshire Photographers is anticipated. The chief object of the Meeting is to consider which are the best and most convenient towns in which to form Local Branches of the Professional Photographers' Association, which has recently been established for the purpose of safeguarding the interests of British Professional Photographers.*

Yours faithfully,

T. C. Turner,

Hon. Sec. Local Branches Organization Sub-Committee P.P.A.

The York Meeting of the Association, at which all professional photographers, whether they are members or not, are welcome to attend, should have an important influence on the Association's future. The establishment of local branches in England, Scotland, Ireland, and Wales is vital to its success. All through the preliminary work of organization, which has so far had the most satisfactory results, this aim has been steadily kept in view. A representative body, having charge of the material interests of a profession numbering between five and six thousand members, must possess the active support and adhesion of a large majority of that number: and the simplest way of achieving this end is obviously by the institution in various parts of the country of branches of the Association, governed by common rules and objects, and controlled by locally elected executive officials. The value of the York Meeting, which will take into consideration the best way of giving effect to this idea, cannot be overrated. The conclusions of next Monday's Conference should strengthen the hands of the Local Branches Organization Sub-Committee in the work that is before it. What is done at York should be in the nature of an example that can be followed by other parts of Great Britain in the establishment of large and powerful provincial centres of the Association. York is centrally situated. The practical support of the Lord Mayor of the city is a distinctly valuable help, and we have no doubt that the energy and enthusiasm of Yorkshire photographers may be relied upon to make the meeting large, successful, and fruitful of ideas in aid of the great object so many have thoroughly well at heart: viz., the organization of the whole of the professional photographers of this country for the purpose of promoting their common interests. We anticipate that the York meeting will be followed by similar gatherings in other parts of the country, so that every professional photographer in the United Kingdom will have the opportunity of personally participating in the work.

Photography and Journalism. It is a fact significant of the trend of the times that a weekly paper has just been started in Paris illustrated exclusively by photographs from nature. "La Vie de Paris" is the title of this journalistic novelty, and M. Léon Vidal rightly draws attention to it as a most interesting publication, although the first three numbers may partly excite adverse criticism. Within the last decade photography has rushed to the front as a graphic recorder of events, and in the near future it seems destined to play a still more important part in journalism. The pace at which we live dictates the necessity for accuracy and brevity of expression. But although photography may be inferior to the art of the draughtsman for the vigorous representation of fact by means of a few lines, the men who are able to give us these representations are so few, compared with those who can use the camera, that the advantage must lie with the latter, when we bear in mind the accuracy and speed of photography. Pictures illustrating important events should be truthful, if they are to be of any value. We want to see what has actually happened, and not a fanciful drawing, such as we too often meet with in our illustrated papers. Editors of the pictorial press are alive to the fact, and if photographers would more generally cultivate the art of rapid work, and insist upon good remuneration for it, they might frequently make welcome additions to their income. It should also be remembered that this is not the only aspect of the question. The publicity given to the photographer must impress his name upon the memory of people, and react favourably upon his other work.

* * *

Infringement of Patent. A law-suit, which the well-known optician, C. P. Goerz, of Berlin, brought against J. Philippe, of Geneva, as representative of H. Roussel, of Paris, has just been decided in favour of the Berlin firm. The proceedings relate to an infringement of the patent of the double anastigmat, and have lasted three years. England, evidently, is not the only country in which the law moves slowly. H. Roussel, of Paris, manufactures a lens similar to the double anastigmat, and J. Philippe, of Geneva, had a number of these lenses for sale, notwithstanding the fact that the double anastigmat is protected by patent in Switzerland. The defendants pleaded want of novelty in the invention, and sought to obtain a revocation of the patent. Dr. J. M. Eder was called as expert. The defendants were condemned to pay 3000 francs damages, and the lenses in Philippe's possession were ordered to be sold by auction. Much may be said both for and against protection of inventions by patent; but, whilst public opinion favours the rights of inventors by special privileges, it is evident there can be no ground for sympathy with men who infringe upon those rights, either by making or trading in the articles.

* * *

The International Centenary of Photography. In 1813 Nicéphore Niepce made known his first attempts to obtain a photograph. An article in "La Photographie Francaise" shows that there is a feeling in France to celebrate the event by an International Centenary, and, though we are still at some distance from the appropriate moment for such a festival, it must be evident that some considerable time must be devoted to to the organization of an international function, whatever its character may be. Our contemporary proposes that an Organizing Committee be formed of really competent and absolutely independent men; but although this committee is to be composed of foreigners as well as Frenchmen, we do not think the means proposed, of sending in lists of names, is a desirable one. We cast no doubt upon the independence of any persons who might be nominated to receive and scrutinise these lists, but the votes would of necessity be drawn from a limited area, near home, and would fail to represent the opinions of those at a distance from the centre. France has a strong, representative, Photographic Society, and we think it more appropriate, when the time is ripe for organizing the Centenary, that the initiative be taken by La Société Francaise de Photographie, and that invitations be issued to representative societies in other countries, if it be desired to make the centenary of an international character. A celebration of this kind might be made most interesting and instructive, and would tend to promote good feeling amongst men following a common purpose.

* * *

Copyright Appeal against Heavy Damages. It will be remembered that in May last (see page 305) we called attention to a matter of importance to photographers whose copyright is infringed. It was then pointed out that they have two remedies open to them under the Copyright Act of 1862, namely, for damages, or for penalties, or for both. In the case then cited a photographer sued the proprietors of the "Graphic" and the "Golden Penny" for penalties—a penalty for every copy of the latter publication printed, and the Court awarded one farthing for each, which amounted to just under ninety pounds, and costs. The maximum penalty under the Act is ten pounds per copy, and, according to the decision in this case, a current coin of the realm must be given, and the smallest being a farthing, that was awarded. A little while back a similar case was decided, and here the penalties at a farthing a copy amounted to no less than the substantial sum of £1054. The case was that of Hildesheimer v. W. F. Faulkner, Limited. It appeared that the defendants ordered from the plaintiffs a million copies of their copyright pictures to be used as coverers and inside stiffeners for small cigarette packets, which were duly supplied at half-a-crown a thousand. Subsequently the defendants ordered another million copies of Messrs. Causton and Sons at two shillings a thousand, thinking that what they had paid for the first million included the copyright in the pictures. The Messrs. Causton were made parties to the action, but they were dismissed from it, with nominal damages against them for forty shillings. In giving judgment against the defendants (Faulkner, Limited), Mr. Justice Kekewich held that he had no alternative but to award a farthing for each copy, which brought the amount of the penalties up to £1054, though at the same time he intimated that if he had the power he should have limited the amount to £200. Against this award the defendants appealed, they having paid the plaintiffs £200, and the balance into Court, on the ground that the damages were excessive. The case came before the Court of Appeal—composed of Lords Justices Rigby, Col-

lins, and Romer—on Friday last, with the result that the Lords Justices allowed the appeal, and reduced the damages to £200. From this it will be seen that a judge has no power but to award some sum for every copy. But the Court of Appeal, it seems, has the power to mitigate the penalties, and have done so. Had the maximum penalty, namely, ten pounds a copy, been imposed, it would, of course, have amounted to ten million pounds. It is not impossible that this case may be taken to a higher Court—the House of Lords. We reprint the "Times" Report of the case on pp. 508, 509.

* * *

The Post Office and Damaged Parcels. Last week a correspondent wrote asking our advice through the Answers column with regard to a negative of his that was smashed while passing through the post. As the subject is of more than passing interest to photographers who transmit negatives through the post, we refer to it again in this column. According to the correspondent the facts are these. His negative had been returned to him by a firm of enlargers, and was delivered smashed to atoms. He says, "A registration fee had been paid to insure its safety; but on my claiming damages, I was informed that the Postmaster-General is unable to entertain my claim, as compensation is only given where there is clear proof of negligence or rough usage in the post, and, after inquiry, nothing has been discovered to lead to the supposition that the parcel was not treated with proper care." Now, if the facts be as stated, what protection has any one who registers a parcel to insure its safety if he has to give clear proof of negligence or rough usage in the post? One would have thought that if a parcel were received by the Post Office in good condition—and it would not be registered and insured unless it was—and was delivered in a damaged one, that it would be at once recognised that it had received rough usage or negligence in the post. What other proof should be necessary, and how is it possible for the owner to prove anything further? Now, the Post Office will give compensation for from five to one hundred and twenty pounds according to the registration fee—from 2d to 1s 2d—but not in consequence of any legal liability. Here is one of the regulations as it appears in the Post Office "Handbook":—"Registration and Compensation:—1. The Postmaster-General will (not in consequence of any legal liability, but voluntarily, and as an act of grace) subject to the rules herein-after mentioned, give compensation up to a maximum limit of £120 for the loss and damage of inland registered postal packets of all kinds upon prepayment of a fee in addition to the postage. The scale of fees and the respective limits of compensation are as follow." From this it would seem that no compensation can be recovered in a Court of Law, as it could be from a railway company or common carrier. Here are a few of the rules laid down in the "Handbook," from which we quote, as they may be of service to those who send negatives and other fragile articles through the post:—"3. The contents of the postal packet must be packed and enclosed in a reasonably strong case, wrapper, or cover, in such a manner as, in the opinion of the officer receiving the same, is calculated to preserve the contents from loss or damage in the post, and to prevent any tampering with its contents, and, if it be desired to secure compensation for damage to a postal packet (other than a parcel), such postal packet must bear the words 'Fragile, with Care.' These words should appear on the face of the cover above the address. 4. The packet must be marked with the word 'Registered,' and with the amount of the fee proper to the value up to which the sender desires to secure compensation, thus: Registered, 2d.; registered, 3d.; and so on." Then follow a number of general conditions, a few of which, that most apply to things similar to those usually sent by photographers, we quote. For example, "12. No compensation will be given in respect of damage to (2) a postal packet containing any article of an exceptionally fragile character, or any other article which, from its nature, cannot with reasonable safety be sent by post." (Whether the Post Office authorities would construe a negative, if properly packed, of an exceptionally fragile character may be an open question.) "4. A postal packet (other than a parcel*) which is not marked 'Fragile, with Care.' *This term is defined in paragraph 27. . . 14. In every case it must appear that the loss or damage did not arise wholly or in part by the fault of the sender, and that it occurred while the postal packet was in the post. . . . 20. Without prejudice to any of the preceding rules, the Postmaster-General will, if he thinks fit, refuse to give compensation for loss or damage on any ground on which a common carrier might in like case claim exemption from legal liability."

* * *

Compensation Claims. The following regulations should be kept in mind when a registered parcel is received in a damaged condition:—"Claims for Compensation.—21. Every application for compensation—(1) should be made either on a form to be obtained at any Post Office (in which case it may be handed to the postmaster), or by letter addressed to the Secretary of the Post Office, London, Edinburgh, or Dublin, and (2) should be made within seven days after the date on which the postal packet was posted. 22. The certificate of posting should be produced when required. 23. Where the application relates to the damage of a postal packet, or to the damage or loss of any article contained therein, the postal packet should be retained for inspection as nearly as possible in the state in which it was delivered. Where the complaint is that the contents of a postal packet have been abstracted, the envelope or wrapper must accompany the application. 24. Where a postal packet when delivered bears signs of injury, the recipient should call attention to the fact of such injury at the time of delivery, and, if possible, open the postal packet in the presence of an officer of the Post Office." This last paragraph is of importance,and if acted upon may often save the recipient a deal of after trouble. In all cases where a parcel is known to contain fragile articles it should be opened in the presence of the postman before the receipt for it is signed. Then there can be no after dispute as to whether the contents were damaged when delivered. The Post Office are not always to blame in the case of broken negatives, inasmuch as they are often so badly protected that it is surprising more do not get broken than are. Very frequently they are merely wrapped in paper, and put into a pasteboard box that dry plates were received in, and posted. This is frequently done with the view to saving the few pence extra postage

that a wooden box would entail. Under such conditions, what wonder if they do sometimes get smashed in transit, even if marked "Fragile," considering that they have to travel with other parcels, and, possibly, have to be transhipped many times? The wonder rather is that they ever arrive sound. It is very doubtful if negatives, so packed, at all comply with rule 3. Can a pasteboard box be considered "a reasonably strong case" to contain a valuable glass negative, particularly if it is of only moderately large size? We have sent, and received, many scores of negatives through the post, which have been in wooden boxes, but in no instance has one been broken, though we have received many smashed ones when they have been simply packed in dry plate boxes.

DIAPHRAGMS AND THEIR NOTATION.

It is an unpleasant fact that, although a great change for the better has been perceptible of late years, a knowledge of the most elementary laws relating to the foci and the apertures of lenses is by no means usual among photographers. The recent wonderful advance in the construction of lenses, however, has brought the subject so much to the front that constant discussion has helped the advance of knowledge, and indeed to understand and appreciate what the modern optician has done for us necessitates a somewhat complete understanding of this subject, and renders opportune the recent pronouncement of the Royal Photographic Society upon lens diaphragms. It seems marvellous, bearing in mind the hundreds of thousands of photographic lenses that have been made, that up to the present time there has not been a universal system of numbering diaphragms adopted by all countries. Yet no such system exists, or seems likely to exist. The first sets of diaphragms that were made had no pretence to system—there was full aperture, and a very small diaphragm, with a series between regularly graduating in size. The first step in a scientific direction was made, nearly forty years ago, by the late Mr. Dallmeyer, who made his diaphragms of such area that each successively smaller one needed double the exposure of its predecessor; some of his lenses, however, having diaphragms requiring an exposure half-way between, and being marked accordingly. If any one required to compare one maker's lenses and diaphragms with another's, he had to make measurements for himself, as the notations adopted by the various makers were purely arbitrary, and not mutually comparable.

So things remained till, twenty years ago, Mr. Watmough Webster suggested a system for common adoption, that a, then, theoretical *f*-2 aperture should be the unit, and all other diaphragm numbers should be direct multiples in inverse proportion to their intensity. The proposition contained also a provision for approximating to an effective aperture. This plan received no support whatever, and was forgotten. But ten years later an identical proposition was made to the Royal Photographic Society, differing only in employing *f*-4 as a unit, and ignoring effective aperture. The plan became popular, and even now lenses are sent out in large numbers marked in accordance with this system, for which, shortly after its enunciation, we proposed the symbol U.S. (Uniform System), which has been generally adopted. But other systems have arisen, varying mainly in the unit adopted; and to this fact, and the theoretical disquisitions to prove the superiority of each maker's unit, may possibly be attributed the failure to acquire that reasonable acquaintance with foci and apertures, which we deplore. The subject was considered too abstruse.

Meanwhile the common sense of the photographic community has led to the virtual adoption of a system of notation which is scientific, logical, and, with one correction factor employed, strictly accurate; and, being founded on the properties of the lens itself, without reference to any base or unit whatever, renders all diaphragm notations marked under the system mutually comparable. We refer to the system of marking the diaphragm with the proportion that the lens focus bears to the aperture, the ratio being represented in the usual way as a fraction, with the focus, of course, as numerator, and the aperture as denominator. The majority of lenses now issued are marked in accordance with this principle, and in all probability all photographic lenses will eventually be marked under this notation, as it does not need any effort of memory to remember a unit, and any one can find out for himself all the necessary data for the purpose.

We have just referred to a correction factor. Nothing of the sort was, as we have said, adopted in the Society's original system; but the precision nowadays expected from makers in describing their products renders it necessary that not merely the aperture, but only that much of it that is effective, be given. We may explain by a parallel. A house might be provided with a drawing-room window of a certain size, say, two yards square, and outside that window with a conservatory built with a frontage five times as high and five times as broad as the window. It would be deceiving a possible tenant to advertise the house as possessing a drawing-room window ten yards by ten yards, for the only way the light could come in would be through the two-yard square window. And so with diaphragms, there is often a waste space of margin that is not utilised, and the true ratio can only be known after ascertaining how much waste margin there is, or else how much of the whole aperture is "effective."

The new system of the Society indicates this: it abandons the U.S. system, and adopts the ratio of focus to true aperture, and this it ascertains by finding the diameter of a bundle of parallel rays issuing from the front of the lens, a point of light being placed at the back focus of the lens for parallel rays.

Owing to the lack of knowledge we have spoken of, this very simple matter will not be universally understood by any means; but it may reassure readers to be told that all existing figures on lenses indicating the *f*-aperture ratio will be, relatively, quite correct; their only error may be that they read too high or too low. The error will be the appreciable breach, and for any one lens may be ignored. It is only when comparing it with another lens that erroneous conceptions can be made. Finally, we may say that our best wishes go with the new standards, and we hope that eventually U.S. may stand for Universal System.

ON PHOTOGRAPHING MINERAL SPECIMENS.

THE merest tyro in photography very quickly learns that it is extremely difficult to render with the lens a correct presentment of the thing photographed. A photographic portrait, even of a beautiful woman, is very often far from being a thing of beauty, and it is by no means uncommon to hear a lady say, "Oh, I never take well." And she tells the truth. Her golden hair and delicately tinted flesh are travestied by the camera, her almost invisible freckles are magnified into dark blotches, and it taxes all the skill of the retoucher to make the portrait passable.

In minor degree, it is the same thing with a landscape. The values get all wrong, and generally we must tack above the horizon the clouds from another negative to make the photograph pass muster. It would be thought, however, that with a study in still life we should be on surer ground, but even here the pursuit of photography, in the hands of a conscientious worker, is full of pitfalls and disappointments. A printed or written page, black or white, can be copied correctly with every peculiarity of the original most faithfully reproduced. Difficulties crop up directly we commence to copy from an object in relief, and when that object is of variegated colour the difficulties at once increase a hundredfold. Modern appliances, and especially the employment of isochromatic plates, have lessened the chances of failure, but still the failures are many, and the candid worker is prone to admit that there are some things which cannot be fairly represented by an untouched photograph.

We who, without any reservation at all, count ourselves among the candid ones, were bound, most reluctantly, to admit this as a truth, when we were called upon recently to photograph a number of mineral specimens, including some gem stones, rough and cut, the pictures being destined for book illustration. Many of the specimens were in the glass cases of a museum, the authorities of which were kind enough to offer every facility in their power for photographing them, but they were bound, by a rigid and very proper regulation, not to allow the specimens to leave the building. These specimens ranged from masses of crystals weighing many pounds to small cut stones of only a few grains, or perhaps carats would be the more correct word.

For many reasons, it seemed to be advisable to use the camera vertically, but only two of these reasons need be considered here. First, the question of lighting pointed to the advisability of this course, for although there was abundance of light from the large windows of the gallery, the most generous amount was procurable on the floor just in front of one of the windows. It was, indeed, the only position in the room where the direct light from the sky was available. The other reason for choosing the vertical position for the camera was the varied shape and weight of the specimens. By placing them on a horizontal surface, they could be wedged up from below, and made to occupy a stable position with the least possible trouble. It would have taxed the ingenuity of an Edison to support them in front of a camera as ordinarily used, to say nothing of the risk of breakage, and some of these museum specimens have a value which runs into four figures.

The position of the camera having been thus settled, and backed isochromatic plates and suitable screen provided, the work was commenced, with every likelihood of being brought to a successful conclusion. Some of the specimens were quite easy to deal with and gave very fine results. We may instance the case of a mass of crystallised sulphur, which, in spite of its golden colour, and, thanks to isochromatic precautions, made a really beautiful picture. The same may be said of a huge gold nugget, which also showed the unusual phenomenon, in gold, of crystallisation. So it was with many, if not most, of the opaque specimens which depended upon surface markings for their characteristic features.

But it must be confessed that some of the stones were enough to try the temper or the patience of Job himself. And now we come back to the bold assertion with which we started, that there are some things which it is quite impossible to represent by an untouched photograph. At the head of these things, so far as they apply to mineralogical specimens, we would place the opal. Not the cut opal as you see it mounted in ring or bracelet, although that probably would be quite as aggravating to tackle, but the opal in the rough. Let us try and describe it. It is a red-brown stone which has apparently been broken in half to show the beauties within. The red-brown crust, or rind, of the stone forms a frame in which is set a glassy mass which is shot with the most wondrous tints, from sapphire blue to flesh-colour. And all through this semi-transparent variegated mass are specks of gold, not real gold, but specks of golden light, and veins of salmon tint. Now choose your best iso plates and your most cunning screen, focus the object with the greatest care, bring all your skill to bear upon the object, and you are bound to fail. We actually tried three separate times to photograph that beautiful, but provoking, piece of opal, but each time we failed. It was a case of try, try, try again, and never succeeding. "You can never photograph that," said the kindly curator; "Professor Blank wanted a picture of it some time ago, and had to employ a water-colour artist to do it, and even he made a mess of it." It was, of course, comforting to hear that a worker with colours at his command had failed to grasp this will-o'-the-wisp of a stone.

With another kind of opal, the Mexican fire opal, we were equally unsuccessful, although in this case the colour difficulty was reduced to a minimum. Imagine a lump of rough hearth-stone, half of which has been dipped in liquid yellow glass, and you will get a far better mental picture of this fire opal than you will from any photograph. You may remedy matters to some extent by having a choice of coloured papers to form the backgrounds for photographs of these mineral specimens, but the opals are beyond the range of the photographic lens.

Let us cite one more instance of failure to secure a sufficiently good picture for reproduction purposes. This was in the case of a beautiful crystal of white topaz. The crystal measured about four inches in length, and was about one inch and a quarter in depth, its section being square, with corners cut off at different angles, while running along it from end to end were well-marked striæ. The negative obtained was, technically, a good one, but the print from it failed altogether to give one a fair notion of the original. It was one of those cases in which a stereoscopic picture was indispensable. Indeed, in all transparent bodies of irregular form and composition there are accidental lights and reflections which play havoc with photography, and it

seems useless to battle with them. The only way in which a passable result could be obtained was by the artistic use of the brush on the positive print, and this expedient had in the end to be largely resorted to.

But these difficulties are made light of directly one attempts to photograph a cut stone, that is, a stone which has been faceted by a gem-cutter on the lapidary's wheel. We not long ago had the opportunity of trying various stones of this kind, from a diamond valued at twenty thousand guineas to a beryl, or aquamarine, as big as a breakfast egg. By a system of reflectors, careful economy of light, and long exposures, it is possible with diamonds to get a fair result, when the stones are massed together, as in a tiara, or other elaborate piece of jewellery. But when we wish to photograph a single cut stone the trouble comes. As each facet is at a different angle to that of its fellows, only a few catch any light at all, and the resulting picture merely throws an outline of the stone, dashed with a few splashes of white, which convey little meaning to the observer. The white topaz, yellow topaz, amethyst, and other descriptions of coloured quartz, phenalcite, chrisoberyl, and other cut stones were carefully photographed, but the result was invariably a disappointment. The pictures, in fact, had to be touched up with body colour to such an extent that they were only photographs in name.

Again are we reminded of the genial curator as his warning rings in our ears. "It's no good, you can't photograph those. Professor Blank tried to, and in the end he had to employ a water-colour artist." And we are inclined to think that Professor Blank adopted the right course. As all who are used to photo-mechanical process work know, a picture has usually to be touched up before a satisfactory block can be made from it. Shadows must be deepened, obtrusive parts painted out, high lights accentuated, and so on. And this is especially true of such things as mineral specimens. Such work it would be unfair to stigmatise as "faking," for the endeavour is to make the picture more truly representative of the original than it would otherwise be. It is not a case of flattering or any other form of deceit; the intention is to put in the picture that which the lens fails to record. It is somewhat unfortunate for the photographer who undertakes to picture cut stones to find that his lens plays him false, for the work of drawing in and painting the facets is one which can only be done by a man accustomed to mathematical instruments, and with some artistic feeling to guide his hand.

AN IMPROVED METHOD OF PRODUCING ULTRA-VIOLET SENSITIVE PLATES.*

II.

Development of the Latent Image.—Of all the developers that I have tried, the pyrogallic-soda developer has been most satisfactory.

Freshly-prepared plates can take equal parts of both solutions without the addition of water usual for dry plates. For raising the intensity of the negative, which is usually low in the beginning, a water solution of potash (1 : 3) may be used, being added to the developer in amount from a few drops to half the volume of soda. A few drops of potassium bromide (1 : 10) render the plate transparent and cause a rise of intensity. It must be remembered that potassium bromide considerably retards the appearance of the picture, and that it only acts with full power when it is present from the beginning of development. Potassium bromide added during the development is nearly without action.

Cold developer acts similarly to potassium bromide. The warmer the former is, the sooner and more complete is the appearance of the image, while very cold solutions lead to negatives richer in contrast.

I prefer to start developing with the bath as cold as possible, and warm it as soon as the most active lines have appeared. I manage the warming in the simplest manner—by rubbing the bottom of the bath with the flat of the hand, which gains the desired effect without trouble. In many cases very clear and powerful negatives are produced with a bath very rich in potassium bromide, followed by a second containing no potassium bromide after the first lines have appeared.

I proceed otherwise when dealing with single exceedingly fine lines, or with dense groups of lines differing but slightly in energy. In this case I make a preliminary exposure with a very narrow slit, from 0·001 mm. downwards. If this does not suffice, which is generally the case, I repeat it, changing the time of development to correspond to the desired result—sometimes shortening, sometimes lengthening it. If the second operation is not successful, a third will generally suffice. It is advisable to expose for a sufficiently long time, but in no case to carry the development further after the lines have appeared. For the analysis of extensive spectra with large energy differences this method is useless, because the slit aperture of the collimator, which is of necessity narrow, considerably enhances the most powerful lines, in which rays of very different activity occur in contiguity, and singles them out before the weaker lines have attained the capacity for development.

Older plates can seldom bear developing with undiluted solutions without becoming fogged. For these, it is necessary to add water (1 volume pyrogallol, 1 volume soda, 1 to 2 volumes water), as well as to increase the quantity of potassium bromide (1 to 3 drops of 1 : 10 potassium bromide per c. c. undiluted pyro-soda solution). Prescriptions for general use cannot here be given. The composition of the developer must be regulated each time by the nature of the experiment and by the age of the plate.

The development takes place with fresh plates, and without potassium bromide in the developer, in two to three minutes, with potassium bromide in three to four minutes, while it requires twice or three times as long with plates one to two months old, on account of the necessarily weaker solutions and the increase in potassium bromide.

I develop small plates (13 × 37 mm.) in an evaporating dish, pouring the mixed solution directly on to the plate. It is advisable to transfer the wet plate from one bath to the other with suitable tongs, on account of the fragile nature of the film. I use tongs with hooked ends of hard indiarubber, which clip the plate at the edges. It is best to leave plate and pincers joined together until the negative is dry.

The appearance of the picture is seen on a white foundation better than on a coloured, and in the same way white dishes are preferable to all others.

The illumination of the dark room may be the same as that for the ordinary dry plate. I always work with the brown light, which is photographically more inactive than the red, and soft to the eyes, which cannot be said of the other.

Fixing, Washing, and Drying.—When development is finished, the basin containing the negative is filled up several times with water, and the plate then immersed in a solution of sodium hyposulphite (1 : 3 to 1 : 4), in which the silver bromide dissolves in a few seconds. In an acid fixing-bath the solution takes longer. In the short period of fixing, the ultra-violet plate differs advantageously from the ordinary dry plate. Productions of lasting value are better preserved by dipping for a few seconds in a second fixing-bath after rinsing the surface with water. In order to wash out the fixing, the plate is placed for about two minutes upright in a stream of water—not so strong as to spoil the film—then sprayed carefully with distilled water, and finally supported on a platform, free from dust, in such a manner that the water can all drain off at one corner. The washing may be conducted in standing water instead of flowing; this is to be recommended in the case of large

* "Annalen der Physik," 1901, vol. v.

sizes. I use for this purpose suitable beakers and evaporating basins. If the film is placed downwards, it is fully washed in ten to fifteen minutes with four or five changes of water. It is freed from its soluble salts, on account of its thinness, more readily than the ordinary dry plate. Drying requires ten to fifteen minutes in the fairly warm still air of the room.

It is not necessary to treat every plate with the care above described, but it is essential when the greatest purity is required. In general, where little dry-spots are no disadvantage, the process can be made much shorter. The plate, after being removed from the first fixing-bath, is held for two minutes in a stream of water and then dried in the neighbourhood of a stove (not too hot), over a lamp or near its cylinder, for which a few minutes suffice.

The Dry Negative.—The image is grey-brown, in transmitted light black-grey with a transparent ground. This transparency makes the deposition of dust particles much more noticeable than with other negatives, which always have a thick ground.

A spectrum on the ultra-violet sensitive plate may be very greatly enlarged, on account of the extraordinary fineness of its lines. The spectra obtained from a very narrow slit give clear pictures enlarged a hundred times. The ordinary dry plate cannot bear enlargement to such an extent, the reason for which can only lie in the greater thickness (five times) and in the relatively greater proportion of gelatine in the sensitive film. V. SCHUMANN.

PRACTICAL TRICOLOUR PHOTOGRAPHY.*

II.

PRECAUTION should be taken (1) not to make the copper plate too hot, as the film will slowly become insoluble, and (2) not to twirl too fast when commencing, as the film will then become too attenuated, and will leave the metal during the etching.

When dry the plate is taken from the whirler and placed in position in contact with the film of the negative in the printing-frame, care being taken that the negative and plate glass of the frame are perfectly free from grit or dirt, which would invariably break the negative when the strong pressure required is applied, and thus render the whole set useless. A thick felt pad is placed next the copper and the frame closed and the back screwed down to the required pressure. The frame is now placed in the light, either daylight or an electric lamp, and exposed until a slip of P.O.P. next the negative in the frame has darkened about half way to its darkest tone (about one minute in daylight or five minutes at about a distance of nine inches from a good arc lamp carrying 25 ampères). After exposure the copper plate is taken out of the frame and placed film uppermost in clean water for a short time (one minute); it is then rinsed under the tap and placed for three minutes in dilute ammonia 20 minims, water 20 ounces; it is again rinsed and stained by immersion in a solution of methylene blue (10 grains in 20 ounces of water) about three minutes. It is next washed in running water until the picture appears quite clean, that is, when the dye is thoroughly washed out from all portions except where retained by the insoluble portion of the film.

The appearance of the picture when examined by a magnifying glass will show whether the exposure has been correct. The plate is next dried off with methylated alcohol, and is then ready for burning in; for this purpose and in the case of a small plate it is held between pincers at one corner over a powerful Bunsen gas stove, moving the plate about and changing the pincers from corner to corner until the high lights of the plate turn red; then at once take away from the burner, allowing the heat contained in the copper plate itself to finish the burning in, which is signified by the high lights changing to a silver colour; the plate is then laid on a stone or metal slab to cool. On examination of the cooled plate it should be free from mechanical defects such as dots missing, holes, scratches, the effects of finger marks, &c. If any small defects are seen they are painted over with an acid-resist varnish such as bitumen or shellac varnish; the back and edges of the plate are also covered with the same varnish, and when dry the plate is ready for etching.

* Concluded from Supplement, page 64.

ETCHING.

Ferric chloride is dissolved in water to a strength of 40° Beaumé; to each twenty-eight pounds of iron, two pounds of ferric hydrate are then added and stirred occasionally during one or two days, then allowed to deposit, and the clear fluid decanted for use.

The solution is placed in a large porcelain basin and heated over a gas stove to 110° F. and is poured into a rocking bath, and when the temperature has cooled to 100° F. the plates are put into the bath film uppermost, the bath being kept in motion for about one minute; after this time the plates as they lie in the fluid are brushed once to and fro, north to south and east to west, with an etching brush (a flat camel's-hair brush bound with wood). The rocking is continued until the total time of etching is from five to eight minutes, the exact time depending upon the size of the dots; if the dots in the high lights are large, and assuming they are to represent white, the etching is continued longer; if on the other hand they are already, at an earlier stage of etching, so small that longer etching would remove them by under-biting, the action is stopped. When it is decided to discontinue the etching the plates are removed and washed under a full stream of water, and then dried by direct pressure (dabbing) with a cloth free from fluff.

The black or other resisting varnish with which the back, margins, &c., of the plates have been protected is now removed with suitable solvents and rough proofs in black ink are taken from the three blocks.

Proofing in Black.

This is for the purpose of ascertaining whether the etching of the plates has been carried far enough, that is to say, it is obviously impossible to know exactly during the etching whether the high lights have been carried just as far as is safe without spoiling the blocks, and whether also the other tones have reached their proper values. If it is found on proofing that either the high lights or other tones are too dark, the etching of the plates is carried further by protecting the portions already sufficiently light with resist, while the remaining parts are lightened, and this may be done either by immersing the plates in the bath, or by painting with a brush charged with the iron solution; if the plates are perfectly dry, the painting out with resist can be omitted, and the re-etching carried out by simply painting the parts it is required to lighten in the manner referred to. It is very important in the process of re-etching that the plates should be thorougly cleansed both from the varnish resist, which has been used for protecting the portions of the plates from the etching fluid, and the ink which has been used for proofing, and if it is intended to re-etch without applying any resist, they should be thoroughly dry. This is accomplished either by slightly heating the plates over a gas-stove or by pouring on the plates a few drops of benzol, which not only loosens the adhesion of the water to the copper, &c., but also helps to remove any traces of ink, grease, &c., and finally wiped with a dry rag. The process of re-etching may be repeated several times until by the examination of the plates with a magnifying-glass and by proofing they are judged to be correct.

Proofing in Colours.

At this stage of the work it becomes necessary to print the plates in correct register, and while, in a printing establishment, the plates may be trimmed and mounted as blocks before the colour proofs are taken, and without any previous attention to register masks, we have found the method employed by lithographers for registering their colours a very convenient one for use in a small laboratory where the methods for registering as employed by printers are not available, and it is required to test the colour values of the prints before the plates are cut and mounted. The method we employ consists in ruling as near as possible to the margin of the original, and before it is photographed, cross marks in black ink on a white ground, at two ends, care being taken that each of these cross marks is reproduced in the margins of each copper plate. When they are printed in the fish-glue resist, these marks are not painted out with the etching resist, but are etched with the image, and will therefore print on the proof. Before the colour proofs are taken, small conical holes are punched exactly in the centre of the cross-lines of each plate. An Albion

press made specially for half-tone proofing is employed, and the plates laid unmounted on a steel bed type high. The yellow proofs are first taken and hung up about eight hours, or until the ink has hardened sufficiently to allow the crimson printing to be taken on top, but before this is done small perforations are made with a needle through the centre of each of the register marks (cross-lines), and when the plate has been rolled up with the crimson ink the yellow print is lowered into its exact position for register with the aid of two long needles, which are fixed in handles, and which are passed through the holes from the back of the yellow prints, and are held with their points in the holes of the plates, and with their length upright until the point reaches the surface of the copper. When the crimson ink has also hardened sufficiently, the blue printing is carried out in exactly the same manner.

The coloured proof is now compared with the original, and if this discloses the necessity for further re-etching, it is carried out.

The blocks are now ready for trimming and mounting, and a practical difficulty arises in trimming so that the margins of all three blocks will coincide. There are several methods in use to ensure accuracy in this respect. The following has been devised by Mr. Symmons, and is the one employed.

A proof is first taken in black ink on card from any one of the plates, and the amount and shape of the subject required is then cut out from this card; the register marks are then punched, and the card replaced with the aid of the needles in register with the image on the copper, taking care when the card is turned over that there are marks to indicate one end from the other. Marks are now made on the copper corresponding with the opening in the card, and if this description of the mode of working has been followed, it is obvious that exactly similar marks can be made on the other two coppers by carrying out the same directions, and in printing the margins of all three prints will be identical.

HOWARD FARMER AND GUY SYMMONS.

LIQUID FILTERS FOR DARK-ROOM LANTERNS.

IN a recent number of this JOURNAL a six per cent. solution of bichromate of potash was recommended as a liquid light filter for dark-room lanterns, to which one grain of eosine per ounce is to be added for chromatic plates. The writer has found that this mixture, which is apparently largely used in England, is not so suitable as a solution of mandarin orange. The following tests were made with a lantern made by a wet-plate dipping bath (giving a layer of liquid two centimetres thick) on to a wooden box, the lamp being a small petroleum night lamp of about one-candle power; the plates to be tested were exposed in a plate-holder in a perpendicular position at a distance of forty centimetres, or sixteen inches, and were then developed in the dark.

With the above bichromate mixture a Barnet medium plate was so badly fogged in two minutes that no further tests were made. With a solution of one gramme of mandarin orange in 500 c.c. of water an Ilford chromatic plate and a non-isochromatic film were badly fogged in two minutes, and slightly fogged in thirty seconds. With two grammes in 500 a Barnet medium plate was not fogged in two minutes; an Ilford chromatic plate was decidedly fogged in four minutes, slightly in two minutes, and not at all in thirty seconds. With four grammes in 500 an Ilford chromatic and Barnet medium remained quite free of fog after two minutes' exposure.

The two-gramme solution is quite safe enough for developing either chromatic or ordinary bromide emulsions. It absorbs somewhat more light than the bichromate-eosine mixture, but very much less than ruby glass so that with this small one-candle-power lamp and an illuminating surface of about 4×5 inches one can perform all the operations of the dark room very conveniently, and can treat the usual isochromatic plate, sensitive to green, like an ordinary plate. Mandarin orange is made by several manufacturers under different names. That used by the writer was from the well-known Gesellschaft für Anilin Fabrikation in Berlin, and cost retail about sixpence for twenty-five grammes. It is called by them Mandarin G extra.

W. S. DAVENPORT.

DRESS AND DRAPERY IN PHOTOGRAPHY.

[A paper read before the Photographic Society of Philadelphia, and reprinted from its "Journal."]

As the beauties of the mind are seen through and adorned by language, so are the graces of the figure set off by drapery—so wrote Flaxman, the great English sculptor; and is not the comparison an apt one? We are all familiar with his beautiful outline pictures depicting scenes and incidents from the Greek poets and from Dante.

One hardly knows which to admire more, the vigorous lines of Chapman's Homer, or the lines with which Flaxman gives life and motion to his flying and running figures, at times poised in the air or cutting through it with extreme rapidity, or gently and gracefully floating through space, the whole effect being produced by the skilful management of the flowing garments. In many points there is a closer analogy between sculpture and photography than between it and painting.

The horses of the Elgin marbles are without doubt the closest possible copies of well-chosen living specimens. Nothing is omitted any more than in a good photograph of the sharp focus school.

Greek sculpture furnishes many invaluable suggestions for the disposition of the drapery about the human figure, but in our imitation of the antique we must bear in mind that though the analogy is close between sculpture and photography, so far as the realistic presentation of nature is concerned, yet photography, like painting, is more limited in its scope for representation of motion, so that it would be entirely out of place for a photograph, or even a painting, to represent a human figure arrayed in a garment closely adhering to the limbs, showing the form distinctly through it, because the clinging of the garments demands an explanation when the motive of the picture does not suggest motion from the wind or some other agent. We sometimes see photography of human models simulating Greek statuary, clad in close-clinging garments, but represented in repose, so that one is at a loss to understand why the garment about the lower limbs is shown in a tense condition, while the upper drapery, by its placid folds, indicates most complete rest. Now when the antique represents a statue in repose, the amplitude of the folds of the drapery entirely conceals its figure. The statuesque photograph savours much of the sensational, even if it is not vulgar or ridiculous.

It is altogether out of the province of photography to suggest the indefinable beauty of the plastic by whitewashing the real. There are many suggestions about the beauty of drapery applicable to photography to be derived from the painters. It would be a long list if we should mention all the painters who delight us with the grace of folds and hangings, both in the figure and in the drapery of the background. We might point to the flowing robes of Titian's Assumption, the dress of Da Vinci's Mona Lisa, to the splendid brocades and satins in the pictures of Paul Veronese, Rubens, Velasquez, &c.

To take suggestions from these masters and from the legion of moderns will be much more instructive than to try to make Galateas, Dianas, and Psyches instinct with life, with a well-satisfied expression, clothed in tissue and mounted on wooden blocks, painted white, to look like marble. Greek mythology, beautiful as it is in the poetic significance, has entirely died out of our poetry, though it still lingers in art. We can find pictures in our drawing-rooms, our parlours, our social gatherings, our workshops, in the busy street scenes where there are blouses, frock-coats and flounces, instead of togas and chitons. We can call to mind numerous paintings, mostly by French and American painters, of scenes and incidents of our modern so-called artificial life, quite as charming as mystic maids or inspired shepherdesses.

Of late years there has been a wonderful advance in the art side of photography, but even in some of the most beautiful of the recent productions which have graced our Salons, we have noticed a disregard of the value and importance of drapery and costume, or an affectation which suggests the dreamy sentimentality of the imitators of Rossetti. We must have taste ourselves and go direct to nature and imbibe fresh drafts from the painters who delight in the delicacy of light and shade in drapery and dress. Did the photographer ever stop to consider what grace is added to an attitude in itself graceful by length of line to a robe, and how often grandeur is imparted to a figure in itself ordinary, by the skill in the disposition of the lines of the folds of a dress? There is a special elegance in the long flowing lines of a lady's habit, more becoming to her native grace than all the devices made of crumpled tissue in which a lady is never seen attired, except when she comes under the hands of the artistic photographer.

It is true that many an ungainly form dissembles under an artfully

contrived costume, so that one is tempted to extend the witticism of Talleyrand and say that drapery, like language, is more serviceable in concealing than in revealing. Still there are those who have so large a share of inborn, or else acquired, grace, that the most ordinary garment, like the tarnished gold-laced hat and huge cockade of flimsy taffeta of Uncle Toby, though not worth a button in themselves, become the person the moment he puts them on, and seem picked out by science to set them off to the greatest advantage. The photographer may here retort: But these gentlefolk of nature Sterne speaks of, are not nowadays so plentifully distributed.

We are obliged to deal with all sorts and conditions of men, to make the best of what fashion chooses to suggest, or the whim of the sitter dictates. We might say in reply, Do as the painters do, or did, to the changes of fashion, and still give us something beautiful. Gainsborough, Reynolds, and others, of a period of absurdity of fashion far above our day, were able to turn to good account the eccentricities of their time. Nowadays no one can reasonably complain very loudly of any lack of artistic feeling in dress. Fashion is controlled more directly by taste, and springs more immediately from the demands of utility and comfort than ever it did before. Dress, however, like new honours, requires the aid of use to make it set well upon us.

When Autolycus appears strutting about in the Prince's dress, the shepherd remarks that his garments are rich, but he wears them not handsomely. Some people are awkward in the most elegant attire, but even ordinary dress on others disposes itself gracefully.

Painters, like photographers, are troubled by ungraceful subjects. There is a picture by Van Dyk of a lady who probably persisted in wearing a very outlandish-looking dress, for Van Dyk would never have asked her to don such a looking one. If he had given it any prominence in the picture it would have neutralised even his genius. But his skill and taste enabled him, not only to get over the difficulty, but also to give us something beautiful. By means of a light ground opposite the light side of the dress, and by help of a curtain which catches and emphasises the lights near the figure, he has drawn away attention from the uncomely dress, and made the effect of the whole picture full and rich to the eye.

He did not have recourse to colour legerdemain for the effect, though he was a prince in colouring, but to masterly management of light and shade not beyond the resources of the photographer.

We are all familiar with Richter's picture of Queen Louisa, where a positive physical defect is so adroitly neutralised by skilful adjustment of drapery.

In a full-length figure a perfectly plain background is difficult to manage so as to give atmosphere, as if the figure had air around it. Drapery is of great value in such a case, and frequently its disposition suggests relief, and the figure does not look as if it were plastered to the background.

The background may help to relieve parts that need relief and to soften down portions which need a lower tone. You can easily see how it is possible to lose the bad side of the figures in the darker folds of the drapery, showing a different source of illumination without presenting the incongruity so often seen in a figure against a plain background, where the shadow on the ground is made to relieve the high light of the figure.

Background and drapery are closely allied subjects, but we refrain, and shall merely refer to Raphael as a master beyond most others worthy of study both for background, drapery, and dress.

By a syncretism we might pass from a discussion of drapery to the consideration of the artistic value of the nude in photography. But we are on debatable ground.

The nude in modern art rarely, one might almost say never, appeals to the emotions or excites in the spectator any sentiment of enthusiasm, rarely any feeling for the beautiful. What, then, is the reason we see so many paintings of the nude at our exhibitions? It is because the nude is regarded as the grand style, or does some other motive not so exalted as the motive to paint for paint's sake animate the brush?

It is not likely that every one who delights in portraying on his canvas the nude figure is possessed of a vulgar, low sentiment to gratify a prurient taste. "Evil be to him who evil thinks," and the painter is not always responsible for the sensual enjoyment of the low-minded.

To the pure all things are pure, and one should remember that there is a difference, as Milton tells us, between sensual and sensuous. The painter and refined spectator may have a sensuous delight in pure animal beauty as displayed in a divinely shaped man or woman. I think the first impression upon a right-minded man made from an exhibit of the nude female figure, either in an admirable work of art (I say admirable because a nude painting fails woefully unless per se it is beautiful) or in the actual living creature, is solely a sense of the glorious harmony of relations and the subtle blending of tints of light and shadow. What the afterthought may be when the imagination enkindles an adventitious growth upon the original impression does not concern the morality of the presentation.

The study of the nude is, of course, indispensable for every artist who is anxious to master the numberless combinations of form that nature offers to his consideration. Without a thorough acquaintance with the naked figure in various attitudes, he can never correctly represent the figure in drapery or understand the play of the muscles in the representation of motion. However great his other qualifications, he would fall below the mark and his work be vague and uncertain.

But to paint or photograph the nude for the nude's sake is not right, nay, it is uncalled for and ridiculous to pass it off as art, as a finished production worthy of the esteem or recognition of any one who delights in the beautiful; and all such pictures painted or photographed merely to show that the artist has technical skill in portraying form, animated by no motive to represent plenitude of power or perfection of grace and dignity, or any poetic sentiment, are apt to pander to the animal tastes of men.

The nude must have its causation in some emotional reason. One needs only to turn to Michael Angelo in the grand figure "Night," on the Tomb of Julian de Medici, or look at Raphael's "Creation of Eve" and the "Parnassus." We forget while we gaze that these female figures are naked in the glorious conception they engender in our minds. We see in Eve nothing but grace and loveliness, sensuous but not sensual beauty, and added to this that expression of inquiring intelligence on the countenance of the first woman, awakening to a realisation of the wonders of the creation about her. The imagination is enkindled to a glow of purity, and all thoughts of evil are impossible.

But rarely does our modern art exhibition of the nude create in us any other feeling than a sensual delight enkindling to an unhealthy imagination. What does modern life, to be honest, care about Nymphs and Naiads disporting to display their charms? We have nothing in common with them, not even an imaginative association, for poetry long ago relegated them to oblivion. Bacchantes, Satyrs, Nymphs, Pans, Hamadryads, Odalesques, and the rest have no meaning for us, and ought not to be depicted by brush or camera.

JOHN BARTLETT.

EFFECT UPON THE PERSISTENCE OF VISION OF EXPOSING THE EYE TO LIGHT OF VARIOUS WAVE LENGTHS.[1]

[Reprinted from the "Physical Review."]

I

IN the early part of this century Plateau[2] engaged in some researches upon the persistence of vision. A disc composed of alternate black and white sectors was rotated at a speed just sufficient to give the surface the appearance of a uniform illumination, the velocity then giving the measure of the duration on the retina of the images of the white portions. By replacing the white sectors in turn with others of red, yellow, and blue, he found that the duration of the images was different for the different colours, being least for the yellow and greatest for the blue. In a much more recent paper[3] the same writer extended his investigations, but used no method capable of giving more accurate or more comprehensive results.

Shortly after the publication of this latter paper, E. L. Nichols[4] introduced the method of using the spectrum instead of pigmentary colours. In the path of the ray of light producing the spectrum was placed a disc with alternate sectors cut out, the rotation of which gave flashes of light followed by equal periods of darkness causing a flickering of the portion of the spectrum in the field of view. The measurement of the velocity of rotation of the disc, at the point when the rapid flickering gave way to a continuous band of colour, determined the duration of the maximum intensity of the sensation. A

1 Abstract of a paper read before the American Association, New York, June 27, 1900.

2 Plateau, "Dissertation sur quelques propriétés des impressions produits par la lumière sur l'organe de la vue." Liege, 1829.

3 Plateau, "Sur une loi de persistance des impressions dans l'œil." Bruxelles, 1878.

4 Nichols, On the Duration of Colour Impressions on the Retina. "Am. Jour. Sci.," Vol. 28, 1884.

series of observations throughout the spectrum showed that the duration of the colour sensation was least in the neighbourhood of the *D* line, and increased towards both ends of the spectrum, the duration at the extreme violet being much greater than at the extreme red.

Taking advantage of this method, Ferry[5] made a more extended study of the persistence of vision, in which he increased the accuracy of the measurements by using an electric motor to rotate the disc the speed of which was recorded electrically on paper placed on the cylinder of a chronograph. With this apparatus Ferry more accurately investigated the law of the duration of retinal impressions, showing that it was a function of the luminosity, and entirely independent of the wave length. In addition to this, he obtained the persistency curves for a number of colour-blind persons. Comparison of their curves with that obtained for a perfectly normal eye disclosed the fact that in the regions to which the eye was colour-blind, the values of the persistence were greater than in the normal, while not differing in other parts of the spectrum.

In his investigations, Abney[6] has shown that the luminosity and persistency[7] curves of persons naturally colour-blind, or made so by disease, or by continued use of narcotics, invariably differed from similar curves for the normal eye.

Very recently Burch[8] has studied the spectrum by producing temporary blindness to the different colours in turn. Sunlight was allowed to stream through glass of the desired colour, and focussed on the eye by means of a lens. After exposure for some minutes to this intensely bright colour, the retina becomes irresponsive to that particular sensation, remaining so for a length of time depending on the wave length of the fatiguing colour. The recovery of the retina was most rapid from the red, and least from the violet. By this method, Burch confirmed the fundamental colour sensations of the Young-Helmholtz theory, but in addition claimed evidence for believing blue to be a fourth sensation.

It was suggested to the writer that a combination of this method with that of Ferry would probably lend itself to a more conclusive determination of the fundamental colour sensations.

Description of Apparatus and Method of Observation.

The apparatus consisted of a Browning two-prism spectrometer, a small motor with a disc attached, and an arrangement for registering the speed of the latter. An acetylene flame in a "Perfection" burner was the source of light, which gave a brilliant spectrum of considerable dispersion. The gas was supplied to the burner at a constant pressure. As the rotation of the disc caused air currents which disturbed the flame, it was found necessary to place the burner on a shelf attached to the wall at some distance behind the motor, and to focus the light on the slit by means of a lens. No flicker could be seen in the spectrum except that due to the motion of the disc, which rotated in the path of the rays of light between the lens and the slit. As the disc had alternate sectors of 90 degrees cut out, the duration of a single flash of light was therefore one quarter of the time of a complete revolution. The general diagram of the apparatus is shown in fig. 1. The speed of the motor was regulated by means of a simple

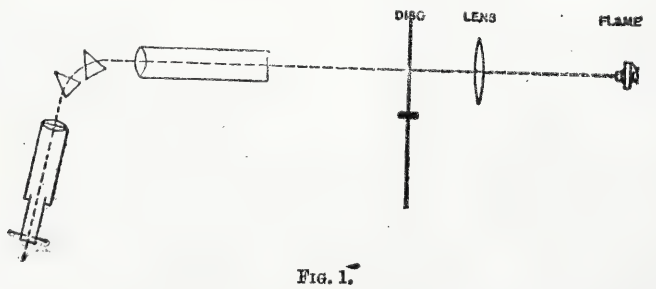


Fig. 1.

form of brake (see fig. 2), made by passing a strap of leather over the smooth groove in the thumb-screw that held the disc on the axle of the motor. One end of this leather was fastened to a spiral spring screwed to the table; the other had a long cord attached, which was wound round a long brass rod turning in a friction socket, also screwed to the table. By turning this rod the string could be wound or unwound, and the friction of the leather on the axle of the motor increased or decreased. With this simple friction brake, the motor could be maintained constant at any speed from zero up to 1800 revolutions per minute for a period of several hundred revolutions.

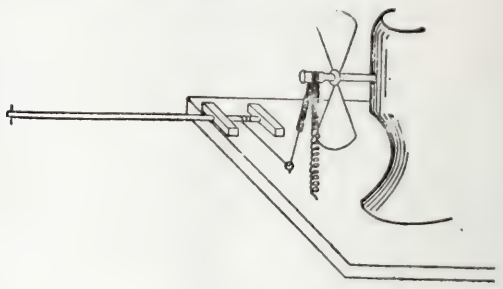


Fig. 2.

To record automatically the speed of the disc a small hand speed-counter was clamped in a position so that its rubber tip pressed firmly against the rear end of the axle of the motor (fig. 3). The rubber tip

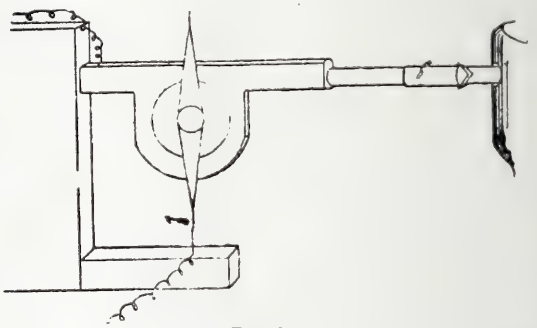


Fig. 3.

served to prevent the relative slipping of motor and speed-counter, and to insulate the latter, which was necessary, as it carried a current. The small index on the counter was replaced by a long diametral arm, the ends of which in turn closed the primary circuit of an induction coil at every fiftieth revolution of the motor. The secondary circuit of this coil passed through metal parts of a chronograph, with a narrow spark gap at the surface of the cylinder. At every fiftieth revolution of the disc, therefore, a spark perforated a piece of paper carried on the cylinder. The pendulum of a clock, by a mercury contact, closed the primary circuit of another coil every second, and similar perforations were made at these intervals on the same piece of paper. The time of fifty or one hundred revolutions of the disc could then be easily measured, and the duration of the flashes of light on the retina computed. In order to have the registering apparatus completely and conveniently under the control of the experimenter, the primary circuits of both coils ran to a double mercury key within easy reach. At the proper moment both circuits were closed simultaneously, and the clock and motor automatically made their records for whatever length of time was necessary.

The method of taking observations was as follows:—By means of a diaphragm in the eye-piece of the spectrometer a narrow portion of the spectrum was isolated. The motor was then started at such a speed that the flickering of the narrow band became quite distinct. By relaxing the fiction brake, the speed was gradually increased until the flickering just disappeared, and a uniform band of colour was presented to the eye. The speed of the motor was then kept constant, while the circuits were closed and the clock and speed-counter made their records. Generally the time sufficient for one hundred revolutions of the disc was recorded as being most convenient for purposes of computation. A little practice enabled one to complete a setting in half a minute. Where greater accuracy was required, the slight tiring effect was avoided by making the first adjustments with the left eye, after which the setting could be obtained by the right eye with an exposure of less than half the time mentioned. After each observation in the case of the normal curves, the eye was rested in diffused daylight for at least ten minutes. Two and sometimes more settings were made at each part of the spectrum; and so constant were the different adjustments of the apparatus, the intensity of the light, and the sensitiveness of the eye, that observations taken at different times, and even on different days, differed from the mean value by less than two per cent.

5 F. S. Ferry, The Persistence of Vision. "Am Jour. Sci.," Vol. 44, 1892

6 Capt. Abney, "Colour Vision." Tyndall lectures at Roy. Inst., 1894.

7 By "persistence" Abney means the reciprocal of the intensity of the light at the point of extinction, which is different from the meaning of the word in this paper.

8 G. J. Burch, On Artificial Temporary Colour Blindness. "Proc. Roy. Soc.," Vol. 63, 1898, p. 35. (Abstract.)

The room within which the apparatus was set up was dark, and all extraneous light was excluded; the only illumination being due to such light as escaped through the screens surrounding the acetylene flame.

To reduce the circle readings of the spectrometer and thus identify the parts of the spectrum in which observations were made, readings were made for various Fraunhofer lines and a calibration curve of the usual form was plotted.

In this investigation a large part of the work done was with the eye fatigued with variously coloured light. In order to conveniently attain this object, a plan was adopted differing from that described by Burch in the paper already cited. In the dark room an arc light was placed on a stand, in front of which hung a dark cloth curtain. Light passing through a hole in this was focussed by a lens upon the slit of a large direct vision spectroscope, which also was calibrated, so that the wave length of the fatiguing light could be found. A diaphragm in the eye-piece cut off all the brilliant arc spectrum except a narrow band about two millimetres in width of the required colour. The intensity of the light also rendered a very narrow slit possible, thus increasing the purity of the spectrum. The eye was fatigued by allowing a narrow band of any pure colour from this spectrum to fall upon the centre of the retina for at least five minutes, a length of time found sufficient to give the degree of fatigue desired. This accessory apparatus was so placed that when the eye had become fatigued the observer, by simply turning in his chair, could make the setting for the persistence, as described above, without any loss of time, and before the eye had any time to recover to any appreciable extent from the tiring process. In taking a series of observations this fatiguing operation was repeated before each setting, after the completion of which the recording apparatus required readjustment, which gave the eye one minute rest. No extended rest was considered necessary during the progress of a series of measurements, as Burch found that any fundamental colour sensation could be exhausted without affecting the others. That this statement was abundantly justified will be seen upon a comparison of the normal persistency curves with those obtained for the eye when fatigued with various colours. The observations could therefore be taken with great rapidity.

When the eye was fatigued with any colour, a piece of white paper placed where the white light from the arc fell upon it, appeared of a tint always complementary to the colour affecting the eye. This afforded a convenient means of enabling the experimenter to determine the degree of exhaustion of the retina.

The time allowed for the fatiguing process with all colours was about five minutes. The uniformity of the measurements, for some of which this time was even doubled, seemed to indicate that with light of a given intensity the exhaustion of the colour sensation reached a maximum in a few minutes, and that further exposure produced no effect. The following experiment served to confirm this inference. The eye was exposed to a band of pure red, the centre of which had a wave length, $\lambda = .680\mu$, and persistence observations were made on a similar band of red, the centre of which had a wave length $\lambda = .758\mu$. Normal persistence = .0179 second. The results are as follows:—

Time of fatigue.	Persistence.
7 minutes	·0195 sec.
5 ,, ...	·0193 ,,
10 ,, ...	·0188 ,,
20 ,, ...	·0188 ,,

Less than a minute rest was allowed between the readings except for the last, which was made two days later. The eye accordingly was under a continued exhausting stimulus with the object of bringing about a greater degree of fatigue. The maximum exhaustion was apparently reached in seven minutes, though the other values may only differ by an experimental error. It may be, however, that the bright light tires the retina to a certain degree at first, after which the eye adjusts itself to the new conditions, and partially recovers its normal condition. The above values would indicate this, though sufficient data are not yet available to establish this supposition. In any case the retina ultimately reaches a point of equilibrium between the destructive action of the external stimulus and the constructive power of the eye. If the luminosity of the source of light is increased, the degree of exhaustion will undoubtedly be greater, and the maximum may be reached in the same or even in less time.

FRANK ALLEN.

THE YORKSHIRE PHOTOGRAPHIC UNION.

THE officers of the Union for 1901-2 are:—Mr. Percy Lund, President; Mr. Godfrey Bingley (Leeds), Dr. Hollingworth (Hull), Mr. J. H. Rowntree (Scarborough), Vice-Presidents; Mr. Alex. Keighley, F.R.P.S., Treasurer; Mr. Ezra Clough, Hon. Secretary.

The following societies comprise the Union:—Batley Photographic, Beverley Photographic, Bradford Photographic, Brighouse Photographic, Cleveland Camera Club, Dewsbury Photographic, Halifax Camera Club, Heckmondwike Photographic, Holmfirth Photographic, Huddersfield Photographic, Hull Photographic, Ilkley Photographic, Keighley Photographic, Leeds Camera Club, Leeds Photographic, Otley Photographic, Rodley Photographic, Scarborough Photographic, Sheffield Optical, Sheffield Photographic, Skipton Photographic, Wakefield Photographic, Yeadon Photographic.

With reference to the Lecturers' List, 1901, secretaries are requested to note the following regulations:—Invitations to lecture should be sent direct to the lecturers. Stamped envelopes should, in all cases, be enclosed for reply. The expenses of each lecturer must be paid to him on the evening of the lecture, and it is expected that the Society will provide hospitality when the return journey is impossible, or inconvenient, on the same night. Each lecture to be acknowledged in club syllabus as "Yorkshire Photographic Union lecture." There is no restriction on the number of lectures which a Society may endeavour to secure from this list. It is understood that the Society making the engagement provides the lantern, if required, and that no charge to the public is made for any Union lecture. Revisions and additions to this syllabus may be necessary from time to time; particulars may be obtained from the Hon. Secretary.

In addition to lectures, there will be two sets of lantern slides issued by the Union for circulation, dates for which may be arranged with the Hon. Secretary.

The following is the list of lecturers for 1901 (the figures in parentheses indicate the number of times the lecturer is prepared to repeat his lecture in a session):—

ATKINSON, W. H., Cemetery Lodge, Batley. "Flower Photo-Photography" (3). Use of backed plates. Isochromatic and ordinary plates. Natural arrangement of flowers. Sundry hints on flower work. Lantern required. 40 or 50 slides.

BEANLAND, Rev. J., M.A., 7, Claremont, Ripon. Choice of the following two subjects (6 or 8). I. "Platinotype Demonstration." Development and modifications (special attention); toning and after-treatment. Small gas stove and two whole-plate developing dishes required. II. "Ruined Abbeys of Yorkshire." Kirkstall, Fountains, Byland, Whitby, Bolton, Guisborough, Marrick, Rievaulx, Jervaulx, Easby, Mount Grace, Eggleston, Kirkham, St. Mary's (York), Ellerton. Lantern required. About 80 own slides.

BINGLEY, GODFREY, Thorniehurst, Headingley, Leeds. Choice of the following six subjects (6):—I. "Lantern Slide-making." Making lantern slides by contact and reduction. Developing, printing in clouds, binding and finishing slides, with a few examples shown in the lantern. Lantern and a few dishes required. 20 or 30 slides. II. "Warwickshire, Gloucestershire, and the Wye Valley." Warwick, Kenilworth, Stratford-on-Avon, Stonleigh Abbey and Park, Alcester, &c. Gloucester, Tewkesbury, Frampton, Berkeley Castle, &c. Chepstow, Tintern, Raglan Castle, Symonds Yat, Ross, Hereford, &c. Lantern required. About 200 slides. III. "The Dales and Coast of Yorkshire." Showing places of interest in Airedale, Wharfedale, Wensley and Yoredale, Swaledale, &c., York, Beverley and Ripon Minsters, numerous abbeys, and the coast from the Tees to Bridlington. Lantern required. About 200 slides. IV. "London to North Cornwall." Districts shown: London, Hampton Court, Henley, Oxford, Salisbury, Winchester, Christchurch, Bournemouth, Swanage, Dorset Coast, villages in West Somerset, Ilfracombe, Clovelly, Bude, Boscastle, Tintagel, Exeter, &c. Lantern required. About 200 slides. V. "East Anglia and Adjacent Counties." Lincoln, Cambridge, Ely, Norwich, Yarmouth, Cromer, Beccles, Caister Castle, Stalham Broad, Salhouse Broad, Wroxham, &c., and several interesting districts in the counties of Herts and Bucks. Lantern required. About 200 slides. VI. "Near the Border, and over." Durham, Newcastle, Hexham, Alnwick, the Cheviots, Edinburgh, St. Andrews, Arbroath, Stonehaven, "Thrums," Perthshire, Ayr, Dumfries, &c. Lantern required. 200 slides.

BRIGGS, H. M., 5, Burton-street, Wakefield. "Norway," a topographical lecture (3). Lantern required. About 90 slides.

BURRELL, B. A., F.I.C., 5, Mount Preston, Leeds. Choice of the following two subjects:—I. "Chemicals used in Photography." II. "Weights and Measures." Will give either two lectures of I., two lectures of II., or one of each. Lantern required for II. About 12 slides.

CAMP, SPARHAM, 22, Upper Albert-road, Heeley, Sheffield. Demonstration: "Negatives and Prints, their modification and improvement" (2).

COUPLAND, FRED T., Springfield, Guiseley, near Leeds. "Carbon: Single Transfer" (3). Short address and demonstration, preferably to less advanced societies.

CROSSLEY, H., Calverley View, Rodley, near Leeds. Choice of the following two subjects:—I. "Bromide Enlarging" (3 or 4). Bromide enlarging for beginners—Negative—Exposure—Paper—Developer and development—Fixing—Toning, by various processes, including copper—and Mounting. Lantern and dishes required. II. "Photographing Machinery" (3 or 4). Exposure, interior and exterior work—Position—Development—Class of Negative—Blocking out and Printing Process, with examples of finished prints.

ELLIFF, PHILIP, 21, Wade-lane, Leeds. "Ceramic Photography" (4). Ceramic photography, with examples of photo. enamels, china, &c., and furnace for firing same. Coal gas supply and few small dishes required.

GASH, JOHN H., 115, Albion-street, Leeds. Choice of the following four subjects:—(4) "The Carbon Process." I. "Practical Hints in Development." II. "Transparencies." III. "Cloud or Double Printing." Three 12×10 dishes, gas stove, hot and cold water required. IV. "The Negative—Practical hints in its Production, Development, and subsequent treatment." Three whole-plate dishes, hypo, clean water (dark room or room made dark).

HEAPS, THOMAS, 25, Holker-street, Keighley. Choice of the following five subjects (6):—I. "The Dry Plate: its Development." A continuation of last year's paper, designed to help beginners to understand the chemical reactions and the tools they use in the production of a negative. Lantern required. 40 slides. II. "Whitby—Photographically." Lantern required. 100 slides. III. "Lantern Slide-making, by contact or reduction." Lantern required. 50 slides. IV. Demonstration, "Gum-Bichromate." V. Demonstration, "Ozotype."

HOLLINGWORTH, J., M.R.C.S., 168, Holderness-road, Hull. "Photomicrography" (2). Lantern required. About 40 slides.

HOMBURG, ALBERT, 51, New Briggate, Leeds. Choice of the following three subjects (3):—I. "Flash-light." II. "Travels in Germany." III. "How to make Lantern Slides." Lantern required for lectures Nos. I. and II.

HOWDILL, CHARLES B., A.R.I.B.A., 7, Oxford-row, Leeds. "Colour and Colour Photography" (3). Theory of Light and Colour—Description of the Joly and Sanger Shepherd processes of Natural Colour Photography, illustrated by numerous slides. Lantern required. 40 slides.

ILLINGWORTH, H. E., A.R.I.B.A., 8, East-parade, Leeds. Choice of the following two subjects:—I. "My Rambles on the Continent" (2). About 100 slides, illustrative of visits to Norway, Belgium, Holland, Rhine, Switzerland, and Paris. Largely architectural. Lantern required. II. "Beauty Spots in the British Isles" (2). About 100 slides, including Yorkshire, Lake District, Whitby, and East Coast, South Coast, Scotland (the Clyde, &c.), North of Ireland. Largely architectural. Lantern required.

KEIGHLEY, ALEX., F.R.P.S., The High Hall, Steeton, near Keighley. Choice of the following three subjects (6):—I. "A Tour round an Old Garden." Showing the pictorial possibilities sometimes to be found within a very limited area. Lantern required. About 100 slides. II. "Principles of Art applied to Photography." The principles of composition, chiaroscuro (light and shade), and general fitness of details and accessories, explained by the aid of numerous slides. Lantern required. About 80 slides. III. "Artistic Mounting and Framing." Dealing altogether with the principles which should guide one in the selection of suitable mounts and frames, illustrated by numerous specimens. Lantern required. About 20 slides.

LEAROYD, J. INGHAM, Rydal Mount, Halifax. Choice of the following five subjects (6):—I. "A Run to Norway." II. "A Scamper on the Continent." III. "Denmark." IV. "Holland, Belgium, and Rhine." V. "Rhine and Switzerland." Lantern required. 150 to 200 slides.

LUND, PERCY, the Country Press, Bradford. Choice of the following four subjects (6):—I. "Tom, Dick, and Harry." A semi-satirical description of the errors into which most novices fall, with practical hints for the would-be sun-artist in regard to the treatment of photographs, so as to render them as pictorial as the limitations of photography will permit. Mr. Lund will illustrate this lecture either with selected prints, if no lantern be desired, or from his own slides, showing good and bad work, or will criticise a series of slides provided by the members of the Society before which the lecture is delivered. II. "The Woodlands: Trees as a study for the Sun-Artist." Illustrated by about 60 examples of the lecturer's own work. Apparatus—Best Time of Day—Curious Trees—Beauties of Trees in Detail—A Course of Study for the Novice—The Woodlands at Different Seasons—and under varying atmospheric conditions. III. "Nature Poets and Nature Pictures." Illustrated by about 50 original lantern photographs, accompanied by selections from poems descriptive and appreciative of Nature. A Comparison between Photography and Poetry—Study of Poetic Thought a Valuable Aid to Pictorial Expression—Thomson — Gray — Wordsworth—Bryant—Tennyson—Extracts from Nature Poets Illustrated by Photographs. IV. "The Field Days of a Sun Artist." With about 70 lantern pictures. How to enjoy sketching with the Camera—Where to Go—Hints on Apparatus—Mistakes of the Amateur Photographer—Wasted Opportunities—Reminiscences of Field Days—Among the Mountains—In Flat Countries—Among the Trees—Rustic Models, &c.

MARGERISON, SAMUEL, Calverley, near Leeds. "What we see in an old Church" (4). Description, with lantern illustrations from a wide area, of the ecclesiological and architectural features of our village Churches. The slides include photographs of many of the rarer objects of interest met with in ancient Churches. Lantern required. About 90 slides.

NAYLOR, G. HUDSON, M.A., 33, Queen-street, Keighley. "A Cruise in the Solent" (5). The Prologue—The Boat—Dramatis personæ—Scenes and Incidents of the Cruise, including an Excursion in the New Forest. Lantern required. About 100 slides.

NEWSTEAD, P. E., Eccleshill, Bradford. Choice of the following two subjects (4):—I. "The Light Side." Illustrated readings from a selection of my humorous writings. Lantern required. II. "Flash-light Work." Good and Bad Flash-light Work—Examples in the Lantern—Demonstration—What Developer to Use, &c. Lantern required.

NICHOLSON, FRANK, Cornwall-place, Bradford. "Lantern Slide-making" (3). Lantern required.

PRIESTLEY, A., 44, Hyde Park-road, Halifax. (Thursday preferred.) "Hints on Portraiture" (4). Treats of lighting, posing, expression, &c., and also on Portraiture at home.

OGLE, HERBERT W., 2, Chevin-terrace, Otley. "A Visit to a Lunatic Asylum" (3). (Friday evenings only.) This is a short lecture for junior societies, illustrative of life in a lunatic asylum, how the patients are treated, and the general working of such an institution. Lantern required. 50 or 60 slides.

SAUNDERS, J. V., M.A., Hymers College, Hull. "Knightly Effigies and how to photograph them" (2). Historical sketch of a knight's equipment, with illustrations. Points to be noted and photographed. Photographic notes on subjects shown. Lantern required. About 30 slides.

SENIOR, A., "Herald" Office, Heckmondwike. Choice of the following two subjects (4):—I. "Carbon Printing, Single and Double Transfer." II. "Stereoscopic Photography."

SHEARD, PERCY, White Lea, Birstall, near Leeds. Choice of the following two subjects (4):—I. "Cairo to the first Cataract." Lantern required. 90 slides. II. "Decorative Photography." Photographic application to the embellishment of every-day furniture. Suggestions only, of a non-technical character. Lantern required. 20 slides.

SKIRROW, J., 9, Cecil-Avenue, Bradford. "A Visit to the Paris Exhibition and Switzerland" (2). Lantern required.

STOCKDALE, R., M.A., 17, Mount Preston, Leeds. "Carbon Process Demonstration" (3). An elementary demonstration of the working of the Carbon Process. Sensitising, developing, single and double transfer. Few dishes and hot water required.

THISTLETHWAITE, GEO., Linton House, Fairweather-green, Bradford. Choice of the following three subjects (4):—I. "Lakeland, with Cycle and Camera." II. "Wensleydale—an inexpensive Tour with Cycle and Camera." III. "1000 Miles in Wharfedale, with Cycle, Motor Car, and Camera." Humorous account of how we discovered these parts. Lantern required. About 100 slides each.

HILDESHEIMER *v.* W. F. FAULKNER, LIMITED.

["Times" Report.]

THIS was an appeal against a decision of Mr. Justice Kekewich as to the amount of the penalty to be inflicted under section 6 of the Fine Arts Copyright Act, 1862, for an unauthorised circulation by the defendants of printed copies of 12 pictures, of the artistic copyright of which plaintiff is the owner. The pictures are used in connection with packets of cigarettes. The action was brought to restrain the infringement of the copyright by the defendants, and on May 22, 1900, an injunction was granted, restraining the defendants from selling or distributing prints of the 12 pictures, other than those made by the plaintiff, and an inquiry was directed to be made in chambers how many copies of the pictures printed by certain other named persons for the defendants had been put in circulation by them. The Master by his certificate found that 1,012,600 copies of the pictures printed for the defendants by the persons named had been put in circulation by the defendants. By section 6 of the Act "if any person, not being the proprietor for the time being of copyright in any painting. . . . shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply for sale, or knowing that such repetition, copy, or other imitation has been unlawfully made, shall sell . . . any copy . . . of the work . . . such person for every such offence shall forfeit a sum not exceeding £10." The plaintiff took a summons for the determination of the amount of the penalty to be

paid by the defendants. The questions were:—(1) Whether the order for the printing of a million copies constituted a million offences or only one offence; (2) whether, if each copy constituted a separate offence, the penalty should be fixed at one farthing for each copy put in circulation, which would amount in the whole to £1,054 15s. 10d., or whether it should be fixed at some smaller fraction of a penny for each copy. Mr. Justice Kekewich said that, according to "Ex parte Beal" (L.R., 3 Q.B., 387) the plaintiff was entitled to a penalty for each copy circulated. But his Lordship thought that this penalty must be some recognised actually existing sum, and not merely a sum which could be expressed in figures, but did not represent any actually existing coin of the realm. His Lordship, therefore, felt obliged to fix the penalty at a farthing for each copy, though he would have been glad if he could have avoided coming to a conclusion which would give an extravagant amount for pictures which were of merely ephemeral value. His Lordship stayed execution pending an appeal, on the terms of the defendants paying £200 to the plaintiff, and paying the rest of the amount into Court. The defendants appealed. It was stated that the cost of producing a million copies of the pictures was only about £100.

Mr. Warmington, K.C. (with whom was Mr. A. J. Walter), for the defendants, argued that the order given by the defendants for a million copies constituted only one offence, though he admitted that "Ex parte Beal" was a decision to the contrary. But he contended that the Court was not bound by section 6 to impose a penalty of at least a farthing for each copy circulated, even if a farthing must be taken to be the lowest coin of the realm. It appeared from the "Century Dictionary" that up to 1854 half-farthings were coined and were in circulation. There was formerly a coin called a "mite," which was said to be one-sixth of a penny. In the year 1330 a petition was presented to the Crown, asking that a smaller coin than a penny might be issued from the Mint, on the ground that a penny would purchase three gallons of beer. The learned counsel urged that there was no reason why the Court should not fix any fraction of a penny it might think fit in such a case as the present, in which one claim was made in respect of the million offences, and there could be only one execution for the total sum awarded. The Court must have a discretion to give the right penalty in respect of the subject-matters brought before it, provided that not more than £10 was given for each offence. The Court might give a lump sum, and was not bound to apportion a certain sum to each offence.

Mr. Warrington, K.C., and Mr. C. A. Russell, K.C. (with whom was Mr. Hildesheimer), for the plaintiff, contended that on the true construction of section 6 a definite sum was to be forfeited for each offence, and that sum must be represented by some existing coin of the realm. This case must be treated as if there were a million actions, one for each offence. That was in accordance with the view of the majority of the Irish Court of Appeal in "Green v. the Irish Independent Company" (1899, 1 Ir., Rep., 386).

The Court allowed the appeal.

Lord Justice Rigby said it had been agreed that, if the Court considered that the plaintiff was not entitled to the amount given by the learned Judge, they were to retain the sum of £200 which had been already paid to them. In his Lordship's opinion the Court was not bound to fix a sum made up of the separate sums which would have been recovered if there had been a separate action for each offence. In his Lordship's opinion there was no such necessity. In his opinion £200 was a proper sum to give, and it was not necessary to go through the operation of adding up all the sums which would have been given if there had been a separate action in respect of each offence.

Lord Justice Collins was of the same opinion. The defendants were technically within section 6, and they had become liable for penalties in respect of a million copies of the pictures. It was admitted that there were a million offences, and that a million penalties had been incurred. The question was, At what rate were the penalties to be fixed? Section 6 spoke of a "sum" not exceeding £10. The penalty must be between £10 and something else. It was said that that something else must be a "sum," and that a "sum" could not be that which had no equivalent in the coinage of the realm; and the learned Judge had given effect to that contention, and had held that he was bound to assess the penalty at not less than a farthing for each offence, though his own view was, if he had felt at liberty to follow it, that the aggregate amount of the penalties ought not to exceed £200. But he held that he was bound by authority to assess the penalty at not less than a farthing for each offence. Was there, then, anything in section 6 which compelled the Court to do that which would be a great injustice? The late Lord Esher in "Tuck and Sons v. Priester" (19 Q.B.D., at p. 638) said, with reference to section 6:—"We must be very careful in construing that section, because it imposes a penalty. If there is a reasonable interpretation which will avoid the penalty in any particular case we must adopt that construction. If there are two reasonable constructions we must give the more lenient one. That is the settled rule for the construction of penal sections." In the present case the action was brought, not in respect of one infringement, but in respect of a million; there was one judgment and one sum was recovered, though it was assessed with reference to each offence. There was no question of levying more than one sum, and there was no necessity for the purpose of levying execution to assess any particular sum in respect of each offence. As was pointed out by Lord Justice FitzGibbon in "Green v. the Irish Independent Company" (at p. 392) the only reason for fixing a farthing as the minimum of damages is "because execution cannot be issued for less." But when there was no necessity to issue execution for that sum, what necessity was there for fixing the penalty at a sum which was represented by a coin? His Lordship could see no reason why in such a case the penalty should be limited with reference to a coin. In the present case the execution could be only for the aggregate sum, and his Lordship could see nothing in the statute to prevent the Court from giving an aggregate sum. The decision of the Irish Court did not bind this Court, though this Court would treat it with the greatest respect. But in that case Lord Justice FitzGibbon dissented from the majority, and took the view which he (Lord Justice Collins) was now taking, and he preferred the reasoning of Lord Justice FitzGibbon to that of the other two Judges. It was suggested, though this was not pressed by the appellants' counsel, that there was only one offence in the present case. So to hold would involve overruling the decision of the Court of Queen's Bench in "Ex parte Beal," which had stood for a number of years, and it could not be overruled now, even if it were not, as his Lordship thought it was, a right decision. In two other cases decided by Mr. Justice Charles and Mr. Justice Wright the point now taken appeared not to have been raised. Now that it had been raised his Lordship, for the reasons given by Lord Justice Fitzgibbon, was of opinion that the Court was not bound to fix the penalty at a farthing for each offence. He could see no reason in the words of the statute or in common sense for so doing. The Court was not limited by the standard of coinage existing from time to time. His Lordship thought that judgment ought to be reversed. In deciding as he did Mr. Justice Kekewich felt himself bound by a decision which did not bind this Court.

Lord Justice Romer agreed. He should have been sorry if this Court had felt bound to affirm the decision of Mr. Justice Kekewich, especially as the Court would then really have been doing that which the learned Judge would not have wished to do, had he not thought that he was bound by authority to do it. If the plaintiff was right, the Act would lead to great hardship. The Court might be bound to award a sum which would obviously be far in excess of what ought to be given. And the judgment would be doing that which the Act had carefully avoided doing—viz., fixing a minimum penalty, when the Act had only fixed a maximum. And, moreover, the sum to be awarded would fluctuate according to the coinage of the country for the time being. These reasons showed that, if the Court was not bound to do so, it ought not to put such a construction on the Act. His Lordship thought the Court was not bound to do that. He agreed that the Legislature did regard each unauthorised copy as constituting a separate offence, and he agreed also that the sum awarded ought to be one which was recognisable and would form the proper subject of execution. But why was the Court bound to fix a sum beyond what it thought just when the action was brought to recover penalties for a number of infringements? So long as the judgment was for a sum for which execution could be levied, was there anything which bound the Court to give for each offence an amount represented by a recognised coin, and not less than one farthing? His Lordship could not think that this was the right construction of section 6. The section did not fix a minimum and did not speak of any coin; it only said "a sum not exceeding £10." His Lordship could see no reason why, when the action was brought for a number of offences, a sum should not be given which, when divided by the number of offences, would give for each a fraction of the lowest coin of the realm. It was said that the Court had no power to do this, because when the action was brought for a million offences it must be treated as if there had been a million actions. His Lordship declined so to treat it. And, even if it were so treated, it by no means followed that the Court would be bound to give a million judgments. So long as the judgment was in proper form his Lordship could see no reason why it should not be for one aggregate sum, even though that sum, if divided by the number of offences, would give for each offence something which was not recognised as a coin of the realm. But his Lordship was by no means satisfied that a farthing was the least coin recognised in this country.

Studio Gossip.

Reminiscences of a Royal Photographer. — To the last number of the Australian "Photographic Journal," a writer, signing himself "Pompeii," contributes the following interesting reminiscences of his experiences in Royal photography. Having received a commission from Mr. Stannard

Warne, of Old Bond-street, to take a series of photographs of Clarence House, the town residence of the Duke of Edinburgh, Her Majesty the Czarina of Russia believing that she would never be able to visit the home of her daughter, the Grand Duchess, who was married to the Duke of Edinburgh, desired to have photographs of everything in and around the Royal residence sent to her, for which she would personally pay all expenses. Therefore, Mr. Stannard Warne ordered me to take photographs of every room and article, separately and collectively in the mansion, which was filled with the most beautiful and valuable collection of gifts which had been presented to His Royal Highness during his travels in foreign countries. The first striking object in a corner of the Grand Duchess' bedroom, was a magnificent display of jewels. A pair of folding doors large enough for a person to stand upright in were encircled with large diamonds, the doors opening in the centre revealed a smaller circle of precious stones, these opening again in the centre revealed a ruby light and more jewels of great value, and to this the Grand Duchess prostrated herself in prayer every night and morning, her religion being that of the Orthodox Greek Church. This mountain of the first water jewels was the present of her father, the Czar of Russia. It must be here explained that a staff of detective police was kept in Clarence House, and every room that I entered I was accompanied by two of them, one at each shoulder. The next valuable object that attracted my attention was the fore-half of a stuffed elephant, with a howdah on its back, which was formed of a fine scarlet material, profusely embroidered with gold and literally smothered with pearl seed, and here and there dotted with jewels of great value. As this was the present of, I believe, the Maharajah of Jublepore, it is needless to say that all these jewels were of the first water. The tusks of the elephant had been sawn off to within about eighteen inches, and a thick circle of gold surrounded the end of each, and again studded with precious stones. This room was called the Museum, and was literally filled with gold and silver trowels, scimitars, long and broad swords of every shape, spears, fur rugs, ivory carvings, banners, Cashmere shawls, and curios. Australia was not forgotten in this collection, for there were considerably sized nuggets, curious pieces of quartz, many kinds of pearl shells, emus' eggs, and many kinds of stuffed marsupials. Whilst engaged in this work the head nurse brought and placed in my arms a beautiful little Princess, and desired me to photograph her, but she set up such a screaming, and could not be pacified, that I was grateful to be relieved of the task. No hospitality was offered to persons engaged in doing work in the Royal household of the Duke of Edinburgh, and the groom of the chambers informed me that I had better send my man out for refreshments, of which I stood in need, having been hard at work since eight o'clock in the morning. And now comes a ludicrous incident. I was very busy at the moment, and sent my man round to a public-house in the vicinity, called "The Windsor Castle," telling him to bring me something to eat and drink. He was a vulgar man, and had no idea of propriety in such a case. Imagine my horror on looking through the window to see him challenged by the sentry to give the password, with a pot of beer in one hand and bread and cheese in the other. As nothing else could be got in the neighbourhood, the man had acted upon his best judgment, anticipating a share in the good things, and it was fortunate for me that no one but the sentinel had seen the contretemps. We will now turn to a subject more cheerful. Clarence House is close to St. James' Palace, and only a few hundred yards from Buckingham Palace, and on the other side, the next building is Marlborough House, the residence of H.R.H. the Prince of Wales. I foresaw in the commission that Mr. Warne had given to me great possibilities, and before proceeding further stopped making any more negatives, went home and prepared prints of what I had done, persuading the Comptroller to submit them to Her Majesty, proposing to be allowed to take some photographs of St. James's and Buckingham Palaces, which Her Majesty most graciously allowed. I had therefore to enter Buckingham Palace, and never shall I forget the beauty of the scene thus presented to my eyes. It was on a beautifully fine July morning, the flower beds were redolent in colours and perfumes, Prince Albert and the Queen, surrounded by the younger members of the family and some of their grandchildren, were calmly enjoying their existence. They were all quietly dressed, and every member there seemed supremely happy. Permission was granted to me to enter some of the principal rooms, accompanied by some of the household officials, and my work at the Palace extended over two days. Then, most graciously, Her Majesty commanded that I might be permitted to do the same at St. James's Palace. This over, I turned my attention to the Prince of Wales, who cordially sanctioned my doing the same thing at Marlborough House.

News and Notes.

At the last meeting of the Council of the National Photographic Record Association 269 prints were presented, and have been forwarded to the British Museum—100 by Sir J. Benjamin Stone of the ceremony of reading the Manx Laws on Tynwald Day in the Isle of Man; views of Charlecote, Stratford-on-Avon, the home of the Lucys; 27 of St. James' Palace; Ashby St. Ledger's Manor House, the home of the Catesbys; 86 by Geo. Scamell, of the Historical Houses of London, and the Locks and Bridges of the Thames; 53 by G. Bingley, of the antiquities of Cheshire; 16 of old London, by H. Bedford Lemere, &c. The total number of prints now received amount to 2105.

The 12th annual exhibition of the Rotherham Photographic Society will be held at the Drill Hall, Rotherham, on October 29, 30, 31, November 1 and 2, 1901. The following are the open classes:—A, Photographs, any subject (previously medalled). Medals, one silver gilt, one silver, and one bronze. No entrance fee. B, Photographs, any subject (not previously medalled). Medals, one silver, one bronze, one certificate. No entrance fee. C, Lantern Slides (sets of four). Medals, one silver and one bronze. One certificate. Entrance fee 1s. per set. Prospectuses will be ready in September, and copies will be sent in due course upon application. The judges are Messrs. C. Barrow Keene, F.R.P.S., and T. A. Scotton, and the Hon. Secretary, Mr. H. C. Hemmingway, Tooker Road, Rotherham.

The National Portrait Gallery.—Last week we made reference to the National Portrait Gallery, and the meagre sum placed at the disposal of the Trustees. Since then the annual report of its Trustees has been published. From this it is seen that the list of donations, loans, and bequests has been increased to 724. Also that 16 purchases were made during the year. It appears that the portrait of Nell Gwynn, purchased in February, 1867, and withdrawn from exhibition the same year, was, by consent of the Lords of His Majesty's Treasury, authorised to be sold, and the proceeds added to the grant for the purchase of portraits. It is interesting to note from the report the total number of visitors during the year 1900. They were 127,888, as against 122,167 in the previous year, showing an increase of about 5000. The numbers admitted on Sunday afternoons were 10,614, as against 11,839 in 1899. This shows a falling off of Sunday visitors.

International Press and Printing Exhibition.—Arrangements are being made by the Crystal Palace authorities to hold an international Press and Printing Exhibition from March 1 to April 30, 1902. It is proposed not only to demonstrate the immense progress of the British, colonial, and foreign Press during the Victorian era, but every development in all branches of the graphic arts and printing trade during the same period will be illustrated by exhibits from all parts of the world. The exhibition will be divided into the following sections:—The British, colonial, and foreign Press (specimen numbers of newspapers and magazines from the earliest times down to the present day), paper-making, paper of every description, letterpress printing and chromo-typography, collotype printing, lithography and chromo-lithography and all photo-mechanical processes, bookbinding and account-book making, newspaper printing, mechanical type-setting and casting, type (wood and metal), electrotyping and stereotyping, printing inks, fine colours, and varnishes, printers' materials and joinery, roller composition, manufactured stationery, die-sinking, embossing, general and fancy stationery, cardboard and fancy box-making, envelope-making, and electrical motors and appliances employed in the printing and allied trades. Machinery and materials of every description used in the printing and allied trades will be exhibited in the sections to which they apply. A Council is being formed, over which Sir Sydney H. Waterlow has consented to preside. It is proposed to award diplomas of merit in the various classes, and the jurors will be elected by the Council. The general manager of the exhibition is Mr. Henry Gillman, the managing director of the Crystal Palace Company, and the organizing commissioner is Mr. Wm. A. Lawton.—"Times."

"The old question of the photograph and the drawing is always being discussed," says a writer in the "Morning Post," "but one heard what seemed to be a new remark the other day. The editor of an illustrated paper had said that photographs were used because in certain cases people wanted facts, and facts alone. Whereupon it was suggested by one of his hearers that though the camera always recorded a host of unnecessary details there never yet was a photograph which produced on the spectator the impression that would have been effected by the original scene. One has seen since the war began hundreds of photographs of men killing or being killed. They have now lost even the interest they once possessed as curiosities: they really misrepresent the thing they record so literally. The camera is an eye without a brain full of memories at the back of it. The human eye never sees the thing that happens precisely, because it is controlled and governed by memories. That is why such a drawing as that by Mr. Frank Craig of the administration of the Sacrament on the eve of a battle touches you, while you can look with incurious eyes on photographs showing how the field of battle looks—to the camera—when the fighting is over. In the one case you get 'fancy with fact': a record of the scene coloured with emotion which would have been aroused in you had you been actually a witness. In the other you get facts, toned down and made impersonal, and it is quite impossible to be interested. For example, there is not a man who draws so badly that he could not do a drawing of a jumping horse which would be far more like the real thing than the best of all the records on a hundred yards of biograph films taken at the rate of ever so many to the second."

Commercial & Legal Intelligence.

Mr. James Newman, 24, Soho-square, W.C., has been appointed artists' colourman to their Majesties the King and Queen.

PHOTOGRAPHER Charged with Fraud.—Henry Archibald Spencer, a photographer, of Clapham, was charged at the Greenwich Police Court on Thursday last with obtaining 9s. by means of false pretences from John Godden. It appeared from the evidence of Detective-sergeant Nursey that the prisoner took photographs, for which he received money, but failed to carry out his orders. There were between 30 and 40 charges against the prisoner.—The prisoner's defence was that the negatives were accidentally spoiled. Eventually a remand was granted.

BALSINTHAN MORGAN, 27, manager, Kent House-road, Sydenham, was brought up on Saturday last at Marlborough-street Police Court, London, and committed for trial charged with stealing cameras. His method was to answer advertisements offering cameras for sale, obtain possession of them without payment, and then pawn them. When arrested by Detective-sergeant Brooks at Ramsgate, Morgan said, "Yes; I have been trying to make arrangements to pay the money." Inspector Drew informed the magistrate that complaints of similar thefts against Morgan had been received from all over the country.

THE King v. the General Commissioners for Income Tax for the District of Clerkenwell.—This matter again came on for hearing in the Court of Appeal on Saturday last, before the Master of the Rolls and Lords Justices Vaughan Williams and Stirling, in the form of an argument on a rule nisi for a prohibition obtained by the Kodak Company, Ltd., and directed to the General Commissioners of Taxes for the district of Clerkenwell, on appeal from the decision of a Divisional Court, refusing to make the rule absolute. It appeared that the Kodak Company was a company incorporated in England, under the Companies Acts, having its head offices in Clerkenwell, and carried on business as manufacturers and dealers in photographic apparatus, etc. The company owned 98 per cent. of the shares in an American company called the Eastman Kodak Company, of Rochester, New York, and the remaining 818 shares, representing £16,000, were stated to be held by 30 shareholders entirely independent of the English company. It was in reference to the liability on the shares held in the foreign company to income tax that the writ of prohibition had been obtained, the Commissioners having, on appeal by the company, affirmed or allowed an assessment of the company's profits made both here and in America, under schedule D of the Income Tax Act. The Attorney-General, in showing cause why the rule should be discharged, said the Commissioners were the judges of fact, and therefore no appeal lay from their decision on a finding of fact. They had found that Kodak, Ltd., was formed to take over the American Photographic Company known as Eastman, Ltd., and to carry on that business from the head office in England. On this finding of fact they were justified in assessing to the income tax the trade profits of the Eastman Kodak Co., Ltd., of Rochester, New York. The Commissioners have found that Kodak, Ltd., substantially carried on the business of the American company, and that therefore the English company were liable to pay income tax on the profits arising from their American business as well as on those from their English trade. Even assuming that finding of fact to be wrong, the appeal ought to be dismissed, and the rule discharged, for prohibition was not a proper remedy, but by appeal by case stated for the opinion of the High Court.—Mr. Danckwerts, in support of the rule, contended that the Court could not, on appeal, go behind the facts of the case. The only mode, therefore, of showing that the Commissioners have come to a wrong conclusion was by writ of prohibition. They submitted that the rule should be made absolute on the following grounds:—(1) That the assessment made went beyond, and was not warranted by any power or jurisdiction given by any Act or Statute relating to the income tax; (2) that neither the Commissioners nor anybody else could make such an assessment for the poor of the parish within which the applicant for the rule carried on business; (3) that the foreign business assessed was not in fact, as the Commissioners have found in error, part of the business carried on by the Kodak Company, within the United Kingdom; (4) that the assessment did not comply with section 106 of the Income Tax Act of 1842.—Their Lordships found that the Commissioners have jurisdiction to make the assessment objected to, and consequently, having apparent jurisdiction, prohibition could not issue, and the rule must be discharged. The rule was accordingly discharged, but with one set of costs only.

Patent News.

THE following applications for Patents were made between July 22 and July 27, 1901:—

DEVELOPERS.—No. 12,421A. "The Preparation and Employment of new Photographic Developers." (Communicated by the Farbenfabriken vormals Friedrich Bayer & Co., Germany.) HENRY EDWARD NEWTON.

RULING MACHINES.—No. 15,017. "Improvements in Machines for Ruling Screens, Films, or Papers for Photographic Purposes." Complete specification. DWIGHT KASSON TRIPP.

CINEMATOGRAPHS.—No. 15,083. "Improvements in or connected with Cinematographs." Complete specification. PAUL FEHLING.

CASES FOR SENSITIVE PLATES.—No. 15,164. "Improvements in Light-proof Cases for Sensitive Plates or Films." ARTHUR AUGUSTUS BROOKS and GEORGE ANDREW WATSON.

PHOTO-MECHANICAL PRINTING. No. 15,187. "Process for mechanically producing Sheets having Relief Counterparts of Pictures or the like for use in Photo-mechanical Printing and the like." MAX DETHLEFFS.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE YORK MEETING OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—Will you kindly remind our Yorkshire and other friends that the time of meeting at the Mansion House, York, has been altered from 8 to 6 o'clock, in order to enable gentlemen from a distance to return to their homes the same evening if desired.

Although this month is an inconvenient one in some respects, great things are hoped of this meeting. Yorkshire photographers are credited with a spirit of strong sympathy for the movement, and from their capital will probably start a strong local Association destined to exert directly a most happy influence on the future of professional photography in all the Ridings of the county, and indirectly upon British photography throughout the kingdom. Every professional photographer will be cordially welcomed.—I am, yours, &c.,

T. C. TURNER,

Hon. Secretary, Local Branches Organization Sub-Committee of the P.P. Association.

THE PRESIDENT OF THE CONVENTION.

To the EDITORS.

GENTLEMEN,—Even in paying compliments it is well to be accurate. I see that your reporter represents the Mayor of Oxford as having stated that Sir William Herschel was the descendant of the discoverer of Neptune, which is wrong. Sir William would be the last to claim for his grandfather a discovery which, in fact, was not made till years after his death, and I presume this is a reporter's error.

As a matter of fact, what Sir William Herschel the elder discovered was the planet now known as Uranus, but which has been variously called the Georgium Sidus and Herschel in former days.

The position of what is now known as Neptune was independently indicated by the late J. C. Adams (then a young graduate of Cambridge) and the veteran French astronomer, Le Verrier. It was first recognised by Dr. Galle at Berlin, though it was seen and noted specially by Professor Challis, of Cambridge, who was also seeking it, but had not the means which, fortunately, Galle had for verifying its nature speedily.

Though this matter is not photographic, I trust that you will excuse my endeavour to give honour where honour is due.—I am, yours, &c.,

J. F. TENNANT, Lieut.-Gen. R.E.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Mr. Farmer's letter on page 463 (July 19) does not answer my letter on page 430, and it is only by reference to his paper in the "Photographic Journal" that I find confirmation of my suspicion that the curves which he gave in THE BRITISH JOURNAL OF PHOTOGRAPHY in opposition to the Maxwell analysis curves were not, like the Maxwell curves, true analysis curves, but merely spectrum transmission curves, which cannot be compared in this connection, they being very indefinite when given without reference to photographic plate sensitiveness. It is not sufficient in such a discussion as this to explain in another publication, and at a later date, that curves given in opposition to photographic action curves are in reality only spectrum transmission curves. I have repeatedly in this discussion made prompt answers to what Mr. Farmer himself said, only to be met with a reference to quite a different statement of the same matter which he made at a later date, and which it was impossible for me to have seen, as in this case.

Farmer's original curves, given when he backed down on "pure-colour" analysis, if taken as photographic action curves (which I had a right to assume that they were given for, because they were given in opposition to my own photographic action curves), would indicate as much action by the darkest violet and darkest red as by the brightest blue and brightest orange, and could not be obtained in practice without strong action by the ultra-violet. Now, I can easily make a bright and many-hued water-colour picture, with a series of dye colours, every one of which transmits the ultra-violet rays almost as freely as a piece of clear window glass, and would certainly reproduce *all wrong* by such analysis as Mr. Farmer indicated. I also know that, even if he cut out the action of the ultra-violet rays, many hues would be falsely rendered, though the results would not then be so ludicrously wrong.

The most important part of Mr. Farmer's letter is his definite assertion that I do not work the process which I teach, but the one which I condemn. The importance of this statement lies in the fact that it is calculated to injure me personally in the minds of your readers, and to still further retard the recognition of true principles in trichromatic photography. Mr. Farmer speaks of "justification" for such a statement, and in that connection I have to say that there can be no genuine justification for a statement which is opposed to the truth.

Exactly what my practice is will be shown shortly in a comprehensive manner; but I will have no further controversy with Mr. Farmer, because he shows no disposition to meet the issues fairly and squarely.—I am, yours, &c., F. E. IVES.

Philadelphia, July 29, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. W. Ellis, High-street, Sidmouth. *Photograph entitled "Hold me up."*

J. Mills, Bath-road, Walsall. *Photograph of the Rev. J. E. McCarten, D.D.*

A. Mathieson, 47, Townhead, Irvine, N.B. *Photograph of a flash of lightning.*

F. Crosland, Bay View, Arnside, Westmoreland. *Photograph of Arnside, from The Viaduct.*

John McKim, trading as J. Adamson & Son, The Studio, Rothesay, N.B. *Photograph of Sir Thomas Lipton's racing yachts "Shamrock I." and "Shamrock II." racing on the Clyde. Two photographs of "Shamrock I." Two photographs of "Shamrock II."*

Williamson Jenkinson, 127, King Street, Dukinfield. *Photograph of "Setting the Clock in Motion, Dukinfield Town Hall, by the Mayoress" (Mrs. Pratt), June 15, 1901. Photograph of the opening of Dukinfield Town Hall by Alderman Pickup, J.P., on June 15, 1901.*

RIVES PAPER.—J. ROWAN. You are quite under a misapprehension; the "B.K.F." firm, at Rives, make many other papers besides their well-known "Rives" paper, which is used for albumenising. But they are all high-class papers.

BROKEN NEGATIVES.—J. J. G. asks, "How am I to proceed to recover compensation for two valuable negatives that have been broken while going through the post?"—Our correspondent will find this subject dealt with on another page.

ORTHOSCOPIC LENS.—T. C. says, "There is a lens in a second-hand shop here, bearing the name of Voigtlander. The front lens is about two and a half inches diameter and the back much smaller. The lenses are very close together, and, as I have never seen one of the kind before, can you please tell me what it is?"—There is very little doubt, from the description, that it is an old orthoscopic, a form of lens that was introduced by Voigtlander in the late fifties.

GELATINE AS A MOUNTANT.—AJAX asks, "Which is the best gelatine to use for mounting prints. I have been using Coignet's Gold Medal and I could get on with it very well if it did not set so quickly. Even when it is much diluted it sets before I can cover a 12×10 print?"—This gelatine is not at all suited for mounting purposes for the reason mentioned, its quick setting property. A softer kind should be used, such as are known as soup gelatines. Nelson's "No. 2 soluble" is a very suitable kind for mounting purposes, as it gelatinises very slowly, and is also free from acidity.

FERRO-PRUSSIATE PAPER.—T. B. W. M. writes: "Will you kindly give me the address of some London firm that makes ferro-prussiate paper, or some agent that makes a speciality of its sale?"—In reply: The paper may be obtained of Messrs. Marion, Soho-square; Gotz, Shaftesbury-avenue, and many other firms, whose advertisements will be found in the JOURNAL and ALMANAC.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—J. C. asks: "Is it necessary to be proposed and seconded, &c., to become a member of the new Professional Photographers' Society, or do you simply send the 5s. subscription?"—In reply: Election is in the hands of the Committee of the Association. The Secretary, 51, Baker-street, London, W., will send you a form of application for membership.

COLOUR SCREENS.—"CHROMOS" writes: "I should be very glad if you could inform me of the best way to make coloured screens for isochromatic work, especially the most suitable sort of dye that will dissolve in alcohol for mixing with collodion?"—In reply: In the Supplement of last week there is an article, read before the R.P.S., in which very excellent colour filters are described, and formulæ given. Most of the coal-tar colours are soluble in collodion. But we prefer the "tank" system to stained films.

CONICAL VERSUS SQUARE BELLOWS.—"INQUIRER" writes: "Should feel obliged if you could answer following: What advantage is there (if any, that is) in having conical bellows on a camera over one fitted with square bellows, or vice versa?"—In reply: There is no advantage in the conical bellows, except that it collapses into a smaller space than the square form does, so that it enables the camera to be made somewhat smaller. On the whole, the square bellows is the more convenient in use, and we, personally, prefer it.

THE COLOURS OF P.O.P.—"COLOUR" writes: "Would you kindly inform me what are the three colours of P.O.P., white, pink, and mauve, used generally for, or is it a matter of choice to use either colour? I mean, Is mauve used for a special purpose, pink, &c.? I've asked this question of several amateurs, like myself, and they could give no answer."—In reply: The colour is simply a matter of taste, and nothing more. Some prefer one tint, and some another. On the whole, probably, the mauve is more generally used than the others.

VARIOUS QUERIES.—"STAINS" writes: "The answer you give to my question of removing toning stains from finger nails I think useless. You assume they are caused by the water. How could it possibly be water? I think it the gold; or do you mean the silver washed out in the water? (2) The kind of scientific paper I mean is 'chemical' or 'medical.' What journal contains advertisements for situations in such places as a laboratory? Perhaps you could mention more than one. Do you know an astronomical journal of similar nature? (3) Could you tell me the head man at the Royal Institution in Albemarle Street?"—In reply: We do not recollect what your previous queries were. Of course, water will not stain the nails, but the silver in the washing waters may, and the toning solution will have a tendency to deepen the stains. (2) "Nature," "Chemical News," "British Medical Journal," "Chemist and Druggist," "Pharmaceutical Journal," "Lancet," &c. (3) Address the Secretary of the Institution.

INSTRUCTION WANTED.—"ATTE" writes: "Please enlighten me as to whether there exists in England a School of Photography, where thorough tuition for professional work can be obtained? One similar to the Effingham College, Illinois, or Guerin's, recently opened in St. Louis, Mo. If there is not such a school in England, would there be much difficulty by paying a moderate premium to enter a high-class house, either in London or a provincial town, where really good-class work can be learnt? 'Atte' is a young man of good address, active and energetic, and desires to acquire the art of photography for professional occupation. He already possesses a limited knwledge of the camera and chemicals. Do you recommend an American or English instruction?"—In reply: "Atte" should communicate with Mr. Howard Farmer, the principal of the Polytechnic School of Photography, 309, Regent Street, London, W. At that institution facilities are available for acquiring the desired knowledge.

ENLARGING.—"LENS" writes: "(1) May I ask your advice upon enlarging matters. I am anxious to instal a good system of artificial light, other than incandescent gas, which I find impracticable for quickness. Is there any satisfactory method of using acetylene that you know of, or any improved form of incandescent? Unfortunately the electric light is not laid near me. (2) Also would you advise me in the choice of the really best lens for enlarging? Would a 7 in. Goerz-Anastigmat, aperture f-6, work as quickly full aperture as, say, a Dallmeyer 2B portrait stopped down to same f-6? I am afraid it is not necessary for me to add I am most ignorant of matters optical. (3) Also, do you consider the Goerz lens is worth the additional money that a Cooke lens, aperture f-6, would cost, and would the latter answer as well for enlarging purposes?"—In reply: (1) Acetylene yields a very good light, and may have some little advantage over incandescent gas. As you cannot have the electric light, and want the illumination for trade purposes, we should say that the limelight would be the next best for you to adopt. (2) Practically there would be no difference in their rapidity. (3) Both lenses are good, but we have not actually tested them, one against the other, for enlarging purposes.

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EX CATHEDRÂ.

Does the Latent Image Fade?

Herr Gaedicke, the editor of the "Photographisches Wochenblatt," sends us a reprint of an article written by him for Eder's "Jahrbuch." He has come to the conclusion that such a tendency exists, and, in the hope of inducing others to make investigations in the same direction, publishes the first results of a series of experiments. In June, 1899, some plates were prepared for a series of tests extending over a period of seven years. The emulsion contained a small quantity of iodide, and was carefully washed to remove all traces of the ammonia used in its preparation. The sensitiveness was kept within moderate limits, as it was desirable to have a plate giving clean shadows. A number of plates were exposed for 120 candle metre seconds under a graduated scale, and stored with a like number of unexposed plates. Rodinal was used diluted with 30 parts of water, and to each 60 c. c. of solution 7 drops of a 10 per cent. solution of bromide of potassium were added. The time of the first appearance of an image was noted, and the period of development was fixed at four minutes, previous experiment having shown that three minutes was sufficient. On June 23, 1899, a plate was developed, and showed No. 13 of the scale. A month later a pair of plates, exposed and unexposed, were taken from the stock. A similar exposure was given to the unexposed plate, and the two developed simultaneously. There was no apparent difference between them. On August 23, 1899, two other plates were used, and a slight difference between them was observable. On October 24, 1899, a more marked difference was noticed between a pair of plates which were then tried. The scale numbers, 1 to 11, were weaker, and Nos. 12 and 13 could not be read on the plate stored after exposure. On December 24, 1899, another pair of plates gave a similar result. On March 24, 1900, two more plates were tried. The fresh exposure was more plucky throughout, but both plates were thinner than the one developed on June 23, 1899. A comparison of the plates freshly exposed on July 23, 1899, and March 24, 1900, showed that there was neither a loss nor a gain of sensitiveness due to storage, but that density was less after the same period of development, a consequence probably due to the more horny state of the gelatine. Another trial was made on June 25, 1900. The freshly exposed plate was the denser, as in the previous cases, but another fact was disclosed. The time for the appearance of the first trace of the image increased from 27 seconds, after two months, to 30 seconds after three months, and 40 seconds after six and nine months, and there was no appreciable difference in this respect between the old and fresh exposures. But in the last experiment the image upon the plate, which had been exposed twelve months before, did not begin to appear until 10 seconds later than the fresh exposure. As development begins more rapidly in proportion to the length of exposure, it follows that the latent image must have gone back. On January 3, 1901, two more plates were tried, and the older exposure again started development 8 to 10 seconds later than the fresh exposure, and was not only flatter, but showed two numbers less. The two series of plates were then exactly superposed in packets. The freshly exposed

series showed No. 15 distinctly, but the series which had not been exposed immediately prior to development only showed No. 12, and there was a gradual loss of density. The edges of the plates were free from fog, which showed that the emulsion was good, and likewise the storage. Herr Gaedicke draws the following conclusions from these experiments:—(1) The latent image on a gelatino-bromide plate loses strength and gradation by long storage; (2) plates coated with a clean gelatino-bromide emulsion do not gain in sensitiveness by keeping; they give less contrast and opacity, and therefore more delicate negatives; (3) dry plates which have been kept resist the developer, and there is a marked induration of the gelatine after four months' storage; (4) dry plates, which have been kept four months, give softer and more delicate negatives than fresh plates.

* * *

Negatives from Negatives. Monsieur C. Drouillard recently read a paper before the Société Francaise de Photographie, in which he described an indirect method of obtaining negatives from negatives by means of permanganate of potash. The negative is copied in the camera by transmitted light, and care is taken that the exposure is not in excess, but preferably slightly under. Lumière's diamidophenol is recommended for development in the proportion of $\frac{1}{2}$ gramme to 100 c. c. of a 3 per cent. solution of anhydrous sulphite of soda, and the plate is developed until no further gain of density is obtainable without veiling the high lights, which should remain perfectly clear. Wash the positive quickly in plenty of water for about a minute, and then expose it to diffuse light for seven minutes. Take 60 c. c. of a 10 per cent. solution of permanganate of potash (for a $7\frac{1}{2}\times5$ plate), and immediately before use add five to six drops of sulphuric acid. After a second rinsing the plate should be immersed in this solution until the positive completely disappears. Slightly wash the plate, and immerse it in a 1 per cent. solution of anhydrous sulphite of soda. As the colour of the permanganate is discharged the negative will appear, and it may be intensified by development. The second development proceeds much more slowly, and it may be accelerated by using the sulphite solution at double strength, with rather more diamidophenol. A saturated solution of sulphite may be used as accelerator. The density of the negative may be estimated by transmitted light, and when sufficient wash the negative, and put it in the alum bath. Wash again before fixing in hyposulphite of soda. After the sulphite bath, which follows the treatment with permanganate, the washing should not be prolonged, but only sufficient to stop oxidation.

* * *

The Price of Dry Plates. In our issue of July 18 we drew attention to the proposed increase of duty upon dry plates in Germany, and the recent action of certain German plate-makers in raising their prices. We pointed out that it might be an inducement to English makers to export plates to Germany, and to compete with German makers in foreign markets. The "Photographisches Wochenblatt" remarks that "German dry plate-makers are now reaping the fruit of their sins in neglecting to educate the German glass industry during the last twenty years. Glass of excellent quality was then manufactured in Germany, and it was only surpassed by English and Belgian glass in minor points, such as exact measurement and even thickness. It would have been an easy matter to induce the glass manufacturers, by tempting orders, to effect these improvements, and thus adapt the home-made article to coating by machinery. Had this been done, German glass might have stood first for dry-plate purposes. Neither English nor Belgian glass could compete with it for flatness, in which respect it was nearly equal to plate. Of course, it would have been necessary to take some pains to educate an old and obstinate industry, and it was less trouble to give it the cold shoulder, and send orders abroad. The bad effects of this false policy of convenience are now apparent." Our dry plate-makers should bear in mind the points in which they have special advantages, and make the most of them.

* * *

Joseph Fraunhofer. The "Central Zeitung für Optik und Mechanik" reminds its readers that on July 21, 1801, just 100 years ago, a terrible accident at Munich was the turning point in the life of this celebrated optician and man of science. The walls of the house in which he lived, as well as those of the adjoining building, were in a defective condition, and, although cracks had made their appearance, no precautions against an accident had been taken, and the inhabitants were allowed to remain in the building. At one o'clock in the afternoon the houses collapsed, and forty-two persons were involved in the disaster. Four persons were buried in the ruins. Two were quickly extricated, but young Fraunhofer and the wife of the looking-glass maker to whom he was apprenticed could not be found. King Maximilian urged on the people to the rescue, and after some time Fraunhofer was dug out unhurt, but the woman was found dead. Fraunhofer was thus brought to the notice of the King, who took him under his protection, and his discoveries have had far-reaching consequences of the greatest importance. A tablet on the house, No. 3, Thiereckgasschen, marks the spot where the disaster occurred.

* * *

Line Engraving Effects. A photographer, F. Kugler, of Sigmaringin, has patented a process in Germany by which the effect of a steel engraving is given to a photograph. This is done by using a ruled film between the negative and the printing paper, and it is sufficiently thin to obviate any perceptible loss of sharpness in the photograph. Similar effects were produced in this country years ago, but we do not see anything of these photographs now. The extravagant language in which the inventor describes the process has called forth a rebuke from the editor of the "Deutsche Photographen Zeitung," who thinks it is time a stand should be made against the want of taste displayed by advertisers in the unscrupulous abuse of their mother tongue.

ARE PHOTOGRAPHS BY ANY PROCESS PERMANENT?

THE above heading may strike the reader in different ways. The pertinent question, however, is this: Is there any photographic process that will yield permanent pictures? First, it may be well to consider what is understood by the

term "permanent," as applied to photographs. We shall, for the moment, assume that it means inalterability, and not necessarily an actual fading of the image. A picture may change in appearance or colour without its actual fading in the true sense of the term. Let us take, by way of example, the earliest photographic process—the Daguerreotype—which is perhaps the more permanent of all silver processes. One frequently hears of Daguerreotypes fading, for that is a very generally applied term when the image has become partially obliterated through insufficient protection against the action of the atmosphere. As a matter of fact, the image is still there, but the silvered surface of the plate has simply become tarnished, and if the tarnish be removed, as it can be, the picture is still as good as ever it was. When a silver picture shows a yellowing of the lights it is often said to be fading, but in many instances there is no actual disappearance of the image itself; indeed in some cases it may actually strengthen. We have hanging before us as we write a framed bromide enlargement done some few years ago and upon which it may fairly be assumed that a reasonable amount of care was bestowed on its production. The lights, however, have assumed a sickly yellow tint, indeed the deepest shadows seem stronger, inasmuch as they have acquired a bronzed or metallic appearance, not altogether unlike the tarnish on a Daguerreotype. Can this be termed fading, though it has changed considerably?

One often sees silver prints on gelatino-chloride paper, and on albumen paper as well, which have long been exposed to strong light, as they frequently are in the showcases at railway stations and like places, that have acquired a purplish tone, and have considerably darkened all over through a sensitive salt of silver being left in the paper. Similar prints are sometimes to be seen in house-agents' windows. Can these altered prints be said to have faded? In many instances this change or alteration is due to the prints having been toned in the combined bath, and removed from it when the desired tone was obtained, and before it was really fixed, hence the darkening by the light's action. This can scarcely be classed as fading in the true sense of the term.

So far we have confined our remarks to silver pictures, but there are two photographic processes—the platinotype and the carbon processes—that are usually accepted as being absolutely permanent; but are the results by them unalterable? Let us consider the platinotype first. Very many of the pictures by this process, after a time, show a marked change from what they were when first produced. The lights, and the paper generally, have acquired a pale brownish tint, arising from the last traces of the iron not having been completely removed from the paper, but when it is removed the platinum image remains as it was at first; but the fact exists that the prints have, to an extent, undergone a change, yet the process, strictly speaking, may be classed as an absolutely permanent one.

Now let us turn our attention to the carbon process. This also may be considered as a permanent one, provided the pigment used *is* carbon, or a similarly stable one. But it must be kept in mind that other pigments as well as carbon are employed to obtain the different colours and tints demanded by its users. To obtain the purples, for example, lakes—cochineal and alizarine—and indigo are largely used, though the cochineal colour is seldom, if ever, employed nowadays owing to its very fugitive nature. Alizarine lake, as used for carbon tissue, can hardly be considered a permanent pigment, though as a dyestuff, on most materials, it is one of the most stable ones. Indigo, again, was condemned as a pigment for the carbon process by the late Dr. Monckhoven on account of its alleged fugitiveness, though it is quite permanent as a dyestuff. It might be argued that even if these two pigments were discharged by the action of light there would still be enough carbon black left to form the image. That would be so in the case of the photographic browns and purples, but a taste has arisen during the past few years for other colours—blues, greens, &c. Now in these colours there can, we imagine, be very little black employed, otherwise the bright tints could not be obtained, as much black would kill them.

We have seen some "carbon" pictures in these colours which have been long exposed to light that have suffered considerably, but we, of course, are unable to say whether the pigment used in the tissue was natural indigo or the artificial article, or even if it were indigo at all. But the fact remains that the pictures, by exposure, had deteriorated considerably. It is an unfortunate circumstance that when a colour fades, or rather is discharged by light, it leaves a very unpleasant tint behind. The deteriorated pictures we have in our mind had a very yellow and dirty appearance in the lights and half-tints, and the delicate details in the former had almost disappeared. Under these circumstances—long exposure to light—the carbon can scarcely be considered a permanent process, yet if only stable pigments be used in the tissue it undoubtedly is a permanent one.

Then, again, the collotype process, in which the image is in a fatty ink, yet we have seen many prints by it in which fugitive pigments have been employed to give the photographic tints that have changed very materially by being exposed in shop windows, but no one would consider, for that reason, that the collotype was not a permanent process. There is another point we had intended to have touched upon, namely, the paper itself and its stability, but space will not permit at present.

JOTTINGS.

THE "Cosmic Influence," as the late H. P. Robinson once styled the characteristics of this feature of the JOURNAL, and which has seldom been absent from its pages for more than a few months' time during the last nine years, has re-asserted itself after a brief interval of suppression. It is not easy to keep one's self in the philosophic frame of mind necessary to the production of these Jottings, when the call comes to take up arms in two or three fights at once. Any photographer who turns back the pages of this JOURNAL for the last six months will find an answer to the frequently asked question, "What has become of Cosmos?" So far as the expression of a personal opinion—in a personal form—was involved, I preferred to stand aside until the bitter feelings aroused by the Kodak and Ogden-Lever controversies had subsided like froth on the rebellious waves. But here I am again, with the old "influence" finding itself free to assert itself in these pages. The familiar smooth-running Great Northern Corridor train has dropped me at the old city of York, and a three minutes journey from the vast North Eastern station finds me an occupant of the Mansion House, the guest of the hearty and

hospitable Lord Mayor and his gracious Lady Mayoress. Picture me, if you please, resting on a warm August afternoon in the finely proportioned state room of the civic palace, the walls of which are covered with more than life-size oil paintings—not photographs!—of past Lord Mayors of York, including a 5000 guinea Reynolds of a Mayoral Marquis of Rockingham, who is said to have been a fine type of the hard-living nobleman of a century or more ago! The antique gold loving-cup and the silver snuff-box, waft one back to ages now well covered with the dust of time; the emblems of authority that now meet my eyes are the sword and mace, and not the pen, the ink, the pastepot and scissors of a journalist's sanctum, and I have exchanged the chains of duty for the possession—temporarily only, alas!—of the venerable specimens of the goldsmith's art officially worn by the chief magistrate of York and his Lady. Decidedly, my surroundings, symbolising as they do the unbroken continuity of English municipal life (Lord Mayor Purnell is, I believe, the five hundred and fifteenth occupant of the civic chair), differ slightly from those upon which I am accustomed to look day by day in a certain secluded office off the Strand, London.

Still the atmosphere is photographic. This beautiful old State Room is the scene of the first provincial meeting of the Professional Photographers' Association. In my opinion the thanks of the whole of the profession are not only due, but will be tendered—"uttered not," perhaps, "but comprehended," to quote Longfellow—to the Lord Mayor of York for the splendid send-off he has given to the long country campaign that must be fought before the Association assumes a soundly representative position in right of numerical power, for it is to be an Association of thousands, not hundreds. Some eighteen months ago I read a little paper at the Royal Photographic Society on "The Municipal Encouragement of Photography," in which I pointed out that by affording facilities for exhibitions and other means the great English municipalities could render vast service in promoting that "upward movement" which is quietly going on in the black art, and which it is essential should continue if, on the one hand, pictorial photography is to win a permanent and respected place amongst modern methods of graphic expression, and if, on the other, professionalism is to be saved from extinction. In some senses the York meeting at the Mansion House is a partial realisation of my dream, and I devoutly hope, for the sake of photography, that the fine example of "municipal encouragement" given by Lord Mayor Purnell will be followed by many of his confrères. Such a form of support will greatly encourage photographers in their arduous work. It is a kind of recognition that will persuade the public to entertain a higher opinion of photography, and do much to dissipate the erroneous ideas that are prevalent on the subject; for a really accomplished photographer giving the public good work has not acquired the necessary skill and knowledge to be able to do so until after years of hard study and application, and therefore deserves, although he may not be entitled, to rank as a professional man. But, besides his own personal efforts, something more is needed to raise the "status" of the professional photographer: the acquiescence, the recognition, the sympathy, the support of the public, the attainment of which is greatly assisted by the encouragement of such public-spirited men as the Lord Mayor of York, to whom, with the Lady Mayoress, I here raise my hat, and, after the fashion of the German Emperor, my glass.

The meeting itself is briefly reported in another column. The proceedings were earnest to a degree, and the immediate result will undoubtedly be a large increase of members of the Association in Yorkshire and the surrounding country. The York meeting will undoubtedly be followed by others in various parts of the country, and members may rely upon it that the work of organizing the local branches is well in hand, the members of the Sub-Committee present, Messrs. T. C. Turner, Harold Baker, William Crooke, with the ordinary members of the Association who had travelled from distant parts of the country, pledging themselves to participate in what I have called the country campaign. Many suggestions of a valuable nature were made, which it would be premature to disclose; but in addition to the Yorkshire and Lincolnshire branch, of which Mr. T. C. Turner will, no doubt, be Secretary, the claims of East Anglia, the south and west of England, Lancashire, Wales, the north of England, Ireland and Scotland, were carefully considered. It is a big scheme, demanding at least a year to perfect, but of its ultimate success there can be no doubt. The report of Monday night's proceedings is necessarily condensed, and only conveys a faint idea of a discussion which lasted quite two hours. Of the speeches that have been omitted, one attributed to the President was said to constitute a plea on behalf of the Association which, if printed and circulated, would be greatly beneficial to that body. Unfortunately, that speech was not reported, and, as a friend of the President of the Association, I have been asked to intercede with him with the view of inducing him to set down in black and white what he said to the meeting in the York Mansion House Room. My influence with the President is considerable, and no doubt he will ultimately say "Yes" to my request. But at present he is holiday-making—having the fever rather badly; and, when a man is in that mood, he is inclined to "jib" at literary composition of a strictly political character. Still, I am "not without hope" that the President will give way to my persuasion in due course.

So then once more to the quiet corner seat in the comfortable corridor that glides north behind the great green North-Eastern flier at the rate of fifty-five miles an hour—past Durham and Newcastle, thick with memories of last year's Convention (the President of which, by the way, was also a friend of mine), and around the far Northumbrian coast across the Tweed once more. Address for the next fortnight or so, vaguely, Scotland! As I speed thither, notebook in hand, and, thanks to the smooth running of the train, pencilling copybook-like characters, which my friends Messieurs the Printers will rejoice at, I must not forget to "give a word or two," as Traill Taylor was wont to put it, to one of my most delightful experiences at York: an hour or so in the "gardens." In this cool and shady retreat the Philosophical Museum and the remains of the enormous Cistercian Abbey are situated. What was it that took my memory back five years as, under the charge of my host and hostess, I did the little tour of this restful spot in restful York? The recollection of one hot July afternoon in 1896. It was on the occasion of the Leeds Convention. The day's excursion was to York. Most of the party had gone off to the Minster; to the Walls; to the Gates; to the River. But a jolly little set of us remained behind that long afternoon in the shadow of the crumbling ruins, photographing and being photographed. One of the jokes was the photographing of H. P. Robinson, the year's President, by fourteen different Conventioners. Shall I ever forget one very old gentleman who, upon being asked to take "H. P.," positively trembled with delight at the honour! Amongst my collection of Convention mementoes, not the least pleasing are those which remind me of the happy hours spent at St. Mary's Abbey, York, that July afternoon. It had passed out of my mind until the Lord Mayor with a touch rolled back the curtain of Time, and showed me the whole scene over again. York stirs many other thoughts in me. One is that it was the birthplace of poor W. B. Bolton, a former Editor of this *Journal*.

Fate, and, I suppose, inclination, ordain that my holidays shall resemble those of the busman, the waiter, and the actor, who are famed in polite anecdotage. When the busman (so it is said) secures a day's leave, he spends it in riding on a friend's omnibus; the waiter assists a friend to wait; the actor goes to the theatre. This holiday of mine, which I vowed all along should be spent in absolute seclusion, far from the sight of a camera, and in the society of unsophisticated persons unable to spell the very word photography, is, as it turns out, to be very photographic indeed. One of my destined visits is to the Glasgow Exhibition, at which Mr. J. Craig Annan has been instrumental in securing pictorial photography the valuable recognition of separate and distinct house room in the Art section. Very great credit indeed is due to Mr. Annan for having achieved something which is destined, I believe, to have considerable influence for good on photography. It is one more step towards securing that authoritative good treatment of photography which

will have a widely helpful effect. Mr. Craig Annan's example has evidently carried inspiration across the Atlantic. At St. Louis, in 1903, there is to be a great Exposition of an international character, and the well-known photographer of that city, Mr. J. C. Strauss, is energetically moving the Exposition authorities to erect a separate and distinct pavilion for the display of the photographs. I wish Mr. Strauss every success in his efforts, but I am sorry to see that he proposes to stultify himself by placing the work of selection in the hands of painters and the like. Photographers, as such, are to have no voice in choosing the exhibits which are to show to the world what photography is capable of doing in 1903. I wonder how long this preposterously stupid state of things is to continue. Is it not time that photographers ceased attaching themselves to the coat-tails of painters, etchers, engravers, sculptors, &c., whose competency to judge work with which they are probably unacquainted has to be taken on trust on account of their academical position, or because of their success in work of a totally different nature, scope, and aim to photography? Let Mr. Strauss select his jury from skilled and successful photographers, and he will make a valuable contribution towards the upward movement I have previously referred to. It is the alien element in photography that always annoys me. The occasional person who is pitchforked into this, that, or the other position, never having helped photography in the past, and unlikely to do so in the future; imported Royal Academicians at our exhibitions, who are out of sympathy with photography for 364 days a year, and mildly and unhelpably patronising of it for the remaining one. Surely this sort of thing shows that photographers are deficient in self-respect and relf-reliance, and at the New Gallery next autumn we shall see, I suppose, the same silly worship of initials (for it is nothing more, I am convinced), which is at the bottom of the "mixed jury" exhibition idea, and one of the least satisfactory features of the R.P.S. show. The photographs, in my opinion, should be judged by competent photographers "in the movement," and not by amiable occasionals. COSMOS.

AN IMPROVED METHOD OF PRODUCING ULTRA-VIOLET SENSITIVE PLATES.*

III.

Spectral Characteristics of the Plate.—If an ultra-violet plate and a very slightly sensitive silver bromide gelatine plate are exposed equally to white light it will be seen that the latter receives an impression capable of development in a far shorter time than the former, for the ultra-violet plate is very little sensitive to visible rays. This holds for the greater part of the ultra-violet spectrum. At 231 $\mu\mu$ it begins to yield more than the gelatine plate, giving more intense and sharper images. Further on towards the shorter waves this activity increases to such a visible extent that the distribution of energy and intensity of the field between 220 and 200 $\mu\mu$, the reproduction of which is well known by all experimenters to lack intensity definition, undergo a complete change. All reproductions of this spectral region represent far more the absorption spectrum of the gelatine than the sensibility spectrum of the sensitive portion of the plate. It is the same with the region between 231 $\mu\mu$ and the green part of the spectrum, where intensity and sensibility are both in an opposite sense dependent on the gelatine, which here acts as a sensitising agent, and considerably raises the sensibility of the silver bromide.

It follows from this that all measurements of light intensity, dependent on the density difference of the spectrum image, are only of relative value, and further, that they do not hold for the ordinary gelatine plate, but only for the plate formerly in use. Consequently, plates of different origin may lead to considerable variations. This fact is more important (as is generally accepted) for spectroscopy, which measures the degree of brightness of the different rays according to the degree of blackening of the lines photographed.

The ultra-violet plate can, in consequence of its sensibility, claim higher distinction than any other plate, on the one hand, for rays only to be photographed in vacuo; and on the other hand, for the uniform reproduction of the rest of the spectrum. To what extent the latter is the case may be demonstrated by spectra of the electric aluminium spark, photographed under similar conditions upon an ultra-violet plate and a gelatine dry plate respectively.

A comparison of both shows how fundamentally different are the representations of energy derived from the same source of light, how little adapted is the commercial plate to the photography of the refrangible part of the ultra-violet up to 185 $\mu\mu$, and how little its sensitiveness to light accords with that of pure silver bromide, which, according to earlier researches of mine, reproduces uniformly all rays of the spectrum, from the blue portion to the smallest waves. It is further worthy of note that the extremely small quantity of gelatine used usually increases the sensitiveness of the ultra-violet plate. It is only thus possible to obtain soft half-tones in the photograph, which are not indicated by silver bromide alone.

A further advantage of the ultra-violet plate lies in its insensibility towards the diffused light of the photographic apparatus, which renders certain operations with the ordinary plate difficult in the highest degree. For example, all reproductions of the spectrum beyond 185 $\mu\mu$ become fogged before the image has attained sufficient power, and so completely that only the most active lines remain visible. This fogging is due to the action of the rays that become scattered inside the lenses and prisms, and reach the plate as diffused light. As the diffused light consists principally of less refracted rays, *i.e.*, of rays which act more powerfully than all others on the gelatine plate, fogging is the natural result. So far it has not been possible, for want of a suitable light-filter, to banish entirely this diffused light from the spectral apparatus, and one has to be content with diminishing it. This is attained without trouble by diminishing the amount of light passing through the slit by shortening the latter (to about $\frac{1}{3}$ mm.). This is the only way to conduct reproductions of electric discharges above the wave-length 185 $\mu\mu$ to the limit of ultra-violet activity of the ordinary dry plate (182 $\mu\mu$). The ultra-violet plate does not suffer from the diffused light, because it is little sensitive to the visible and neighbouring ultra-violet rays. With this, therefore, the length of the slit may be regulated at will without the fear that length of exposure will cause fogging. V. SCHUMANN.

* "Annalen der Physik," 1901, vol. v.

A METHOD OF MOUNTING PHOTOGRAPHS.

To mount photographs of, say, whole-plate size and upwards without the finished result creating despair in the heart of the operator from the amount of cockling, is a consummation often attempted but seldom achieved. Solutions having this end in view are plentifully strewn along the path of the photographer, and should make his life a bed of roses if their performance was equal to their promise, which is seldom the case. The portrait man who confines his mounting to cartes-de-visite and cabinets is seldom disturbed by this evil, as the subsequent operation of burnishing compels the cards to assume an even surface. The evil is most felt by the photographer whose business necessitates the use of mounts not amenable to the coercive treatment of the rolling press, and pre-eminently by any one who has the mounting of photographs on thin supports, for insertion in reports and works of a similar character.

Mountants in which the greater part of the necessary water has been replaced by methylated spirit have been suggested as a remedy; but, while they lessen the evil, they do not entirely remove it. If buckling of the mount is to be cured, the prints must be mounted in a dry state, and the film of mountant borne by the print must be just sufficient to attach it firmly to the mount and no more. The great virtue of the method here described consists of the marvellously thin film of tenacious mountant applied to the print in its dry condition, shrinkage by this means being entirely obviated. A drawing-board with a perfectly smooth surface and of fair dimensions, an ivory or bone burnisher attached to a short handle, with some common glue, are the principal requisites. Take, say, a quarter of a pound of the glue broken into small pieces and cover it with water in a clean gallipot, large enough to allow for the subsequent swelling of the glue. Place on one side until the glue has become thoroughly per-

meated by the water, then pour off the excess and dissolve the glue in the water it has absorbed, by placing the gallipot in a vessel of hot water. The solution tested with a piece of blue litmus paper will show a distinctly acid reaction, which must be carefully neutralised by adding some solution of carbonate of soda. The amount of water absorbed by the glue will probably be too little to give it the best working consistency, and, if this is the case, sufficient should be added to make it about the thickness of ordinary molasses. Careful filtration through a cambric handkerchief, and the addition of about ten grains of thymol, completes the preparation of the mounting solution. As glue deteriorates by frequent and prolonged heating, it is preferable to make up a stock solution, from which sufficient for the work in hand can be taken in the form of jelly, melted, and used up right away.

The finished prints, dried and trimmed to the required size, are placed on the boards they are to occupy when mounted, and, as it is impossible to remove a print for readjustment once it is laid down for final mounting, the wisest course is to indicate by light pencil marks on the mount the exact position the print is to occupy; then it may be laid down accurately and without any indecision. A small gas or oil stove is required on the mounting-table to keep the glue liquid, but maintaining the solution in a constant state of ebullition throughout the operation is unnecessary and harmful to the glue; the flame should be regulated so that the mountant is kept just at the melting point. Place the drawing-board beside the gas stove, and with a house-painter's brush of good quality and size spread the glue over an area considerably exceeding the dimensions of the print to be mounted. A thin coating of glue evenly applied to the board is the end to aim at, to accomplish which the brush should be worked in horizontal strokes, crossing these with others at right angles. Have at hand a small pile of paper cut into pieces somewhat larger than the print to be mounted (old newspaper answers admirably for these pieces), lay one down on the glued patch and press it well into contact by passing the closed hand across it in all directions. Raise one corner of the paper, and slowly but firmly strip it from the board. Repeat the operations of glueing the board (in the same place) and stripping the newspaper two or three times, when a beautifully even cushion of glue will remain on the board.

Mounting the prints is the next step. The cushion of glue obtained on the board has to be coated with glue for, say, every second print, but the amount applied must be as small as possible. After applying the glue the print is laid down upon it, a square of the waste newspaper laid over the print, which has then to be rubbed well into contact with the glue. Raise a corner of the print with the point of a penknife and strip it from the board, as in the case of the newspaper. Care must be taken when handling the print in its glued condition to keep the fingers well beyond the edges of the print, in order that no glue may be abstracted from the edges. Lay the print quickly down upon its mount; with a clean, soft linen duster smooth it everywhere into contact, place upon it a square of photographic drying-board, and with the bone burnisher go over it in all directions, using considerable pressure. The finished result is a mounted print that shows no signs of buckling, and which adheres to the mount with perfect tenacity.

G. T. Harris.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION: MEETING IN YORK.

The first provincial meeting of the Professional Photographers' Association was held on Monday evening, in the Mansion House, York. The Lord Mayor (Ald. Purnell) kindly granted the use of the State room for the purpose; and also hospitably entertained the committee and members. The Lord Mayor took the chair at the meeting, which was attended by Mr. Thomas Bedding, F.R.P.S., editor of The British Journal of Photography (President); Mr. T. C. Turner (Hull); Mr. W. Crooke (Edinburgh), Mr. Herbert Watkins (Scarborough), Mr. T. Birtles (Warrington), Mr. W. Barry (Hull), Mr. Warwick Brooks (Manchester), Mr. C. Fox (Bradford), Mr. F. S. Garrison (Doncaster and Goole), Mr. T. Sleights (Pocklington), Mr. W. H. Duncan (Hull), Mr. G. Mappy (Selby), Mr. J. H. Osborne (Hull), Mr. P. J. Dysart (of Messrs. Debenham, York), Mr. G. Hedley (Lincoln), Mr. A. Jennings (Keighley), and others. In welcoming the members of the Association the Lord Mayor said he sympathised with its objects, which were of a defensive character. He advised the members to unite with one another and pointed out the value of combination. There were difficulties in all professions which could only be surmounted by union. He was very glad to have the opportunity of welcoming the members, whose stay in York he trusted would be pleasant.

The President moved a cordial vote of thanks to the Lord Mayor for his reception of the Association, which was carried with great applause, and, the Lord Mayor having to leave, took the chair, and gave a brief history of the Association, together with an outline of its aim and object.

Mr. T. C. Turner, of Hull (Hon. Secretary of the Local Branches Organization Sub-Committee), next addressed the meeting. He said they had to face a changing condition of professional photography. Twenty years ago the possession of a negative ensured to its producer practically all the photographic work likely to be required by the sitter. The cheap and common enlargement schemes, free portrait swindles, and innumerable other devices for damaging and diverting business from its legitimate and normal channel were not then in existence. As a result, perhaps too much prominence was given to the system of charging for prints in "dozens" instead of adopting the more professional method of asking fee for a personal and artistic service. Now it was found that sitters desired far more careful and able work in the studio, while the orders for prints averaged far less than in the days gone by.

Unless, then, professional men showed a tendency to greatly raise the charges for small numbers of photographs there was the risk of studio workers bearing all the expense of negative production from which other men outside would make the profit. That serious and coming danger had already thrown its shadow before them, and they owed their present organization largely to the indignation aroused by the daringly advertised schemes of pillage on photographers' work. If they proved unable by combination and the use of their wits—to successfully combat these operations—photography would not be worth following as a business. It was a mistake to suppose that this evil would affect only the better class of photographers! Every grade of studio work, good, bad, and indifferent, was found nowadays subject to its own parasitic growth; and that was the chief reason for urging unceasingly the active co-operation of every professional, whether he basked in the sunshine of court and society patronage or struggled along in the wilderness of a manufacturing centre. Several suggestions for protecting photographers' work had already appeared in The British Journal of Photography, which had a practical look about them, but nothing could be done on an effective scale until professionals were so well organized and impressed with the necessity of friendly business brotherhood as to ensure for future schemes a keen interest and probable adoption.

Following Mr. Turner's remarks, a lengthy discussion took place, to which Messrs. Crooke, Birtles, W. Barry, Harold Baker, H. Watkins, T. Birtles, and others contributed. The speakers, without exception, testified to the need for the Association, and the opinion was expressed that within a short time a membership of some thousands would be reached.

The York meeting will probably be followed by others at Brighton, Manchester, Liverpool, Aberdeen, Edinburgh, the Isle of Wight, and other large photographic centres. The meeting separated with cordial expressions of thanks to the Lord Mayor and Lady Mayoress for their reception of the members.

WAYFARING EXPERIENCES.

II.

It is an advantage at times when travelling to be without visible signs of the craft of the lens, because one gets hold of experience that might otherwise not reach the ear. "That old chap in the corner, he is not interested in photography, so we can say what we like," is evidently in the mind, if not the spoken word, of many one sees in a railway carriage. It is not every one who cares to give to his friends in conversation the result of an experience that has not turned up trumps, if there is another near by whom he does not know, but who appears to be a camera man, too. So sometimes it is interesting to be reading the "Daily Flail" with an eye or ear for any good thing that may be going. And, by the way, the way in which some of these daily papers do handle photographic and other delicate matter is awful. The spirit is—"We are telling you something new and

good, and, as we tell you, there is no doubt about the truth of it," while it may be ancient history, and fiction at that. These pronouncements are frequently bodily "lifts," or "exchanges" from American sources by a person who does not understand the matter, and who has not had the sense to "English" the thing. One scientific and popular American weekly is drawn upon by a London weekly both for matter and illustration in a shameless way, and not a word of credit is given. Perhaps, as one of a long-suffering race, the English editor thinks it is only paying off old scores, and so one hears now and again—as the English paper is popular among railway travellers—extracts from a paper that are the echo of what one has seen before somewhere else.

Going further on the journey in which we gathered the former experiences, some other interesting items came out. Two young men were exchanging confidences over photographic troubles and doubts. One was somewhat experienced, evidently, in photographic work, but he had to admit things occurred now and then that "beat him." "I now and again get in for a 'streak' of pinholes," he observed. "Well, you should do what the most elementary book of instruction tells you; wipe your plates, keep the dust out of your camera and dark slides, and keep air-bubbles off the face of your plates in development." "All of which I have done from my photographic youth up, and yet they come And here is the point that I cannot make out. I observe a few pinholes when fixation is complete, and then I wash and put the plate to dry. It dries, and then I swear the pinholes are far more numerous than before." "Were they there when the film was wet?" "Of course, they always occur in subjects where they are particularly not wanted." "Yes, that is my experience; but your story is pretty in a way." "You do not quite credit it I see, but I have no doubt whatever. I have a theory that they come from weak places in the film, so that when the plate dries the emulsion pulls in every direction, and where the weak spots are there come the pinholes."

They could not agree as to any other reason, and the conversation went into other channels. By-and-by it got round again to photographic subjects, and this time it was the other man who had been vexed by the frilling of cut films, which he said he preferred to plates, for the reason that he could take a good supply for a holiday at one-tenth of the weight of glass. And as they cost more he had learned to be a little more careful in not using them as rapidly as one is tempted to do now and again, say, with a hand camera. But he had dropped across a batch that had shown a great tendency to frill. This had perplexed him not a little, because he liked the yellowish tint of the pyro developed article, and that went, to some extent, at any rate, if an alum bath were used. He had developed while on his trip, and, using a candle lamp, there was a piece of candle lying near while he was developing. An inspiration came to him, and he ran the edge of the film into the candle; being thin, of course, there was but the slightest coating of paraffin wax, but the result was success, and he got no more frilling.

At this point these travellers left me, and I pursued my way to a very picturesque fishing town, much in evidence and repute among artists. I mean, of course, they of the pencil or the brush. That there are others there can be no doubt, but the conventional title is understood in either case. There is nothing like seeing a new town, or if not a new town (in relation to experience), an old one that is picturesque, in the grey of the evening, and so after I had got rid of the dust and had refreshed, I hied me out to prowl around the place. Then is the time to see pictures, but it is to be feared that the strong light of the next day takes the glamour off them, and most of them cannot be secured without quick exposure and good light.

After a while, taking rest upon a seat overlooking the sea, two chums came upon the scene, and they took unoccupied portions of the same seat. Between the puffs of holiday smoke (it almost appears as though men smoked more leisurely when on holiday—"the lazy term") drifted fragments of conversation that were clearly photographic. Then the continuity of things became clearer, so: "I have been here a week, and I came with my stand camera only—a quarter-plate, that is quite big enough to take about on a holiday. But the subjects seem to demand a hand camera, and so I hired one from a local dealer. He said he had only a new four-guinea apparatus, but if I would take care of it I might have that. Now, I have a hand camera. It is a good one; it has a shutter that must be set; it is fixed focus; it has a simple changing gear; and the used plates cannot get mixed up. The one I borrowed had an ever-set shutter, with a safety plate to prevent, I suppose, slips in exposure; it was a focussing camera; the changing gear was such that the exposed plates fell into a well, theoretically, to lie there immovable, kept in place by springs." Then followed some puffs of tobacco smoke in rapid succession as though the smoker had experienced annoyance. "Well," said the other. Continuing, the first remarked, "I went out to get some lovely things. I did not bang off upon everything I saw, but took my time and got some charming selections—just the right light, and all the rest of it. I hugged myself at having dropped upon such a place. Then at night I proceeded to develop. The first showed no signs of coming up as it might, and by-and-by fogged over from forced development. There were eight, and I tried to get something out of them all, but clearly there was no exposure in any case." "How in thunder was that?" "That is how I felt, too, and I thought heavy thoughts against myself and all photographic creation, but in the end, with an inspection of the camera, I came to the conclusion that I had remembered the ever-set shutter, but not the safety plate that was in front of it, and I had banged off at the dark." Even the sufferer laughed then, with his friend for company, but he had not finished, for, said he, "The basket of my experience was not full. The next day I went at it again, not forgetting the cause of my trouble, but I only did half a dozen, and then attempted development. Exposure had been truly made, but not a single picture was in focus. I had forgotten that the confounded thing had to be focussed, and the lens was set for a near subject. This was another lesson, and I never forgot it. Then I began to get negatives, but another sweet development turned up; half my picture in each case was foreground, because the finder was not coincident with the lens. Then, getting over a stile, I raised my camera hand, and there was a joggle in the camera, after which it would not work. Search for the cause of this revealed the fact that the plates in the well were all sixes and sevens, and right across the lens. So I developed what I had done and returned the thing. I said to the dealer, 'I should certainly not talk of it out of doors, but I would not give him eighteenpence for the whole outfit.' The moral of this is: do not use a strange hand-camera without rehearsal, and do not let your enthusiasm for subjects run away with your camera sense." After which there was calm and quiet, and the aroma of a good cigar used enjoyably.

The next morning I started work, and I confess I never came across so many artists to the square acre before, but there was ample excuse or reason for it. But as Royal Academy pictures are made, it was evident that the place has plenty of material. And yet, so far as I know, I have never seen a picture at any of the photographic exhibitions which came from this spot. Thank goodness, it is not "'Arried" yet, and, being far afield, there is hope for it. Americans have discovered it, and here was one with the ever-present Kodak, not that he was much of a photographer, as he was pleased to say in the course of a conversation that set up itself, as it were. He was lying lazily on the sand with a sixpenny edition of Kingsley's "Two Years Ago" in his hand. "We are great admirers of your Kingsley," said he, "and I have been up to the land of 'Westward Ho!' It is a delightful country. A friend said I ought also to read this book on the spot, where much of the action takes place. No precise indication is given by the author as to the little fishing town, but my friend is sure it is here on this north coast of Cornwall. I am a bit of a photographer, and what I am astonished at is a prophecy of Kingsley's, which, as you know, must be well-nigh fifty years old now—I should say, though perhaps we may on our side be able to beat it—that this is the first reference to photography in a work of fiction. This is the more interesting, too, because of this place being the resort of artists, and because, I am told, not far away in another Cornish fishing town there has been said to have been invented a system of colour photography. But I will tell you what Kingsley says—if you do not already know. One of the characters is a naturalist whose knowledge of objects of the seashore is deep. Kingsley had made an artist friend of his take photographs of minute corallines under the microscope, and the artist says, 'I am tired of painting nature clumsily, and then see a sun-picture outdo all my efforts—so I am turned photographer, and have made a vow against painting for three years and a day.' 'Why, the photographs only give you light and shade.' This is the contention to-day," said the American, speaking by way of comment, "but listen to the character speaking—which, of course, is Kingsley's

prophecy—'They will give you colour, too, before seven years are over—and that is more than I can do, or any one else,' and this evidently was an honest belief that photography in colour would speedily come," said the American. "I believe," he continued, "that on our side we have scored in this matter, and I understand that there are those of my countrymen who almost claim the invention of photography for us. And still photography in colour, that is photographs—prints made by the sun—have not come. I am not a little tickled to see in the railway carriages that brought me here some landscape prints which are labelled 'colour photography,' which, of course, is about as inexact as it could well be."

Much pleasant chat ensued, and another topic turned up incidentally—that of photography of bird life. Said the American, "I do not endorse all the ultra things my countrymen say, and I have come across one which may have been made in ignorance, or for other reasons—the desire to make money. Putnams, the great New York publishers, are bringing out 'The Home Life of Wild Birds,' which is thus announced: 'Its method of study is revolutionary. Its hundred and fifty illustrations are from life, photographed at a distance of six or eight feet. Such short-range photography has never before been heard of; but Mr. Herrick has noted down and pictured every movement of scores of bird families, their growth and history. This remarkable book gives a new certitude to the science, and a new light to the lover of birds.' Since I have been in England I have come across two books by Kearton that seem to me to show that there is nothing new in this claim; and beside I know, too, that Reid, of Wishaw, and Lodge have done splendid work. When short-range photography is claimed, I cannot forget that in America Shufeldt has done magnificently with fishes—which, of course, are not birds. We like to claim all that is worth claiming, but we need not in doing so make statements that may hardly stand sifting." And with this pleasant little talk a very pleasant incident passed.

IRA ROMER.

THOUGHTS CONCERNING THE NATURE OF THE LATENT IMAGE.

I.

A FEW months ago we published a paper by Dr. Luppo-Cramer, of Charlottenburg, which was read before the Verein zur Förderung der Photographie on January 11 of this year. The full account of the experiments there referred to has been published in the "Photographische Correspondenz," and, as it is of great interest, we give the following translation of this contribution to the literature of the subject.

The fundamental question in the theory of photography, as to the nature of the latent image remained in a dormant condition for a great number of years. The sub-haloid theory was generally considered sufficiently in agreement with other theoretical aspects of the subject, and with the teachings of experience. But the resuscitation of the nascent silver theory in 1899 induced various investigators to make fresh experiments, and these resulted in Eder's refutation of the arguments of the nascent silver theorists, and the rehabilitation of the sub-bromide theory.

As every hypothesis with insufficient grounds has no claim to rank as a theory, it may be in a certain sense a hindrance to the advance of science if we fail to estimate it at its true value. For this reason it is dangerous to rest satisfied with the sub-bromide theory. Even if its competitor be no better, an attack upon such a hypothesis always tends to elucidate the question, and the resuscitation of the nascent silver theory has been of service in compelling us to revise all the old arguments for and against, and to adduce new ones in opposition to it and its rival in the field. Our literature has thus been enriched by a series of valuable experiments. Experts, who no longer took interest in the question of the nature of the latent image, have had their attention directed once again to the fact that our theoretical knowledge of the process by which the developable photographic image is formed is as defective as its practical services are immense, if not ideal.

It is not my purpose to reinvestigate the nascent silver theory, nor do I propose to attack the sub-bromide theory, but the various experiments I have made show so clearly how little many of the old arguments prove for or against both hypotheses, that it may not be unimportant to make these results known.

The experiments, in which metallic silver was brought into contact with silver bromide during development were regarded as the chief support of the nascent silver theory. Eder then demonstrated that the old experiment with silver wire was untenable, as it could be easily proved that the reaction failed to take place in the absence of pressure. The reduction induced by the wire was merely a common case of fog caused by pressure. The so-called contact experiment was repeated by the adherents and opponents of the nascent silver theory in various forms, metallic silver powder and moistened silver, reduced by metol, being used for the purpose. On the one hand, the experiments were attended by very uncertain results, whilst on the other it was absolutely necessary to withhold belief in their conclusiveness, because the negative results with comparatively coarse particles of silver did not exclude the possibility that a finer form would bring about the expected reduction. The finest form of silver with which we are at present acquainted is doubtless the deposit formed in the development of a photograph by the Lippmann colour process, as the particles most approximate in size to the wave lengths of light. I therefore prepared some bromide of silver emulsions by the Lippmann process, and we will call for sake of convenience the silver obtained from these by reduction "grainless silver."

Ten grammes of gelatine were dissolved in 150 c. c. of water containing 2.5 grammes of bromide of potassium, and a solution formed of 10 grammes of gelatine, 150 c. c. of water, and 3 grammes of silver nitrate was added at 40°C. A bluish opalescent solution was obtained, which was reduced with the following solution: 10 grammes of crystallised sulphite of soda, 100 c. c. of water, 1 gramme of hydroquinone, and 5 c. c. of ammonia sp. g. 0.910.

Reduction took place immediately. After a lapse of ten minutes 10 c. c. of glacial acetic acid was added to the dark brown emulsion, which, in a thin film, was quite transparent. This was to prevent further superfluous action upon the gelatine by the products of oxidation in the developer. The emulsion was then poured upon ice, and, after setting, broken up, and washed in the usual way for 24 hours to remove any trace of soluble products.

A similar bromide of silver emulsion was prepared at the same time, and reduced with ferrous oxalate as a check, to show whether the other emulsion contained any product which might be due to the oxidation products of the developer and their action upon the gelatine. Five grammes of sulphate of iron were dissolved in 25 c. c. of water, and 15 grammes of oxalate of potash dissolved in 75 c. c. of water was added thereto. Reduction takes place considerably slower with iron than with hydroquinone, but is complete in an hour. However, traces of iron were still found in the gelatine after sulphuric acid had been added to destroy them, although the emulsion had been washed for 24 hours. As basic ferric salts were probably present, the emulsion was melted again; 5 c. c. of dilute sulphuric acid, 1 in 5, were added, and, after setting, the emulsion was again washed for 24 hours. It was then found to be quite free from iron.

In this way I obtained two kinds of grainless silver, which were then used to ascertain their effect upon a gelatino-bromide of silver emulsion of high sensitiveness. I added to a quantity of bromide emulsion, equivalent to 5 grammes of AgBr, 5 c. c. of silver emulsion. This represents about 0.04 grammes of metallic silver, and the plates thus prepared were tested in the wet and dry states. In order to make an exact comparison of the results, the emulsion, without any addition, was exposed each time with two plates to which the silver was added. One of the plates charged with silver was fixed, whilst the other was developed simultaneously with the original emulsion.

It was found that metallic silver, even in this finely developed state, had no influence upon the silver bromide emulsion, as the developed negative, which had been charged with silver, was only distinguishable after fixation from the pure silver bromide negative by the presence of the same quantity of silver which was visible upon the plate coated with emulsion plus silver, which had been fixed as a check.

As the conditions were the same, both with the silver reduced by hydroquinone and by iron, it could be assumed that the presence of any other product than silver and gelatine in the reduced emulsion was excluded.

My next experiment was directed to the conversion of the grainless silver obtained in the manner described into sub-bromide by bromising it directly. 0.6 grammes of bromide, in the form of a 1 per cent. aqueous solution, was added to an emulsion of grainless silver, prepared in the manner already described and containing 2.5 grammes

of $AgNO_3$. This was in the proportion of 1 part of Br to 2 parts of Ag, necessary for the formation of sub-bromide. To watch the transition in the colour of the red-brown silver emulsion, a sample was taken and examined by daylight after making each addition of 20 c. c. of bromine water at intervals of five minutes. In all the experiments the precaution was observed of adding the bromine in the dark room. The colour passes through various shades, difficult to describe, to red-violet.

Although 2 parts of silver had been brought into presence of 1 part of bromine, according to theory, it was not, of course, certain that sub-bromide was actually present, but it could be assumed that this hypothetical substance had at least been partially formed. The method of preparing silver sub-bromide from sub-bromide of copper, as described by Otto Vogel, seems less likely to succeed with gelatine, because of the difficulty of completely removing the copper from the emulsion, which Waterhouse's repetition of Vogel's experiment also seems to indicate. But I made use of the reactions given by Vogel for sub-bromide in testing the product of my experiment for the bromising of silver. The substance was partially soluble in thiosulphate, and the colour showed a marked change by assimilating itself to that of the silver emulsion, which favours the generally accepted process of the decomposition of the sub-haloids into metal and bromide. The addition of ferricyanide of potassium to the thiosulphate instantly rendered the solution colourless.

To obtain further information, and ascertain if the bromine had to some extent combined quantitatively with the silver in the gelatine emulsion, a further molecule of Br was added to part of the bromised emulsion, which already contained 2 parts of Ag to 1 part of Br. In the event of the combination being quantitative, the further addition of bromine would effect a complete conversion to bromide of silver, but such was not the case, as it was necessary to add nearly half as much again as theory required in order to convert it to the pale silver bromide giving a clear solution with thiosulphite of soda. The aromatic odour of the bromised emulsion also proved that part of the bromine had formed organic compounds. In consequence of this the experiments with the hypothetical sub-bromide were made on the one hand with the product obtained by adding the theoretical quantity of bromine, and on the other with that obtained by adding 50 per cent. more bromine. This was of a dark steel-blue colour.

If the sub-bromide is a substance amenable in some degree to chemical reactions, it is reasonable to assume that it should be present in these various bromised products, and, as the first series of experiments showed that metallic silver did not exert any action, and that partially formed AgBr must also be inactive, the experiments with these products of bromine should eventually confirm the sub-bromide theory to this extent. But it was found that the addition of these substances had no more influence upon a bromide emulsion than had metallic silver in the first experiments. It was consequently impossible to obtain a synthetical confirmation of the sub-haloid theory in this manner.

The destruction of the latent image by the direct action of bromine, or by substances bringing about an indirect action of the halogens, has always been regarded as the principal argument for the sub-bromide theory, and Eder recently cited this fact again in his paper on the "Silver sub-bromide theory versus the nascent silver theory,"[1] as an argument in favour of the sub-bromide theory.

By conducting the experiment of adding the bromine to the latent image upon a gelatino-bromide plate, in a new way, I found that in this particular instance the destruction of the latent image is no proof whatever of the sub-bromide theory.

In each instance a freshly prepared 1 per cent. solution of bromine was used, and pairs of plates were soaked in it for five minutes, one before and the other after exposure. They were then washed in running water for 2½ hours. The action of the bromine before and after exposure was precisely the same. There was no trace of an image in both instances, whilst the unwashed check plate gave a correctly exposed perfect negative. The image was not entirely removed by a 0.1 per cent. solution of bromine, used in precisely the same way, and the formation of a negative was not prevented by previously treating the plate with the same dilute solution of bromine. Traces of an image in the high lights were visible in both cases, but twenty times the exposure did not suffice to produce the same effect when compared with a normal undipped plate. An exact comparative experiment was therefore made, it being probable that the light had changed considerably after a lapse of 2½ hours, whilst the unexposed plate was being washed after treatment with bromine. Undipped check plates were exposed before and after, and estimated relatively. It was found that bromine had more influence upon the plate before exposure than upon the latent image.

The plates used in this experiment were found to be very strongly tanned and slightly reddish in colour after fixing. Upon examination it was found that the gelatine films treated with the 1 per cent. solution of bromine were quite insoluble in boiling water, and after destruction of the gelatine with strongest nitric acid it was found by means of silver nitrate that the gelatine had combined to some extent chemically with the bromine, in accordance with the experience of Eder.[2]

The experiment I have just described, which show that bromine affects the plate to a greater extent before than after exposure, seem to overthrow the only support of the sub-bromide theory. Yet the further fact that bromine converts the sensitive film to an insoluble substance, when used in the quantity we have specified, and even partially remains in it after the plate has been washed, deprives the experiment of conclusiveness in relation to the sub-bromide theory. The absorption of bromine also fully accounts for the fact that the plate treated with bromine before exposure shows less distinct traces of an image than that which had been so treated after exposure.

These experiments show that it is impossible to obtain any knowledge by means of gelatine plates concerning the action of bromine upon the latent image on account of the susceptibility of the medium to change. It was therefore decided to use collodion emulsion plates, which were prepared according to Baron von Hübl's formula.[3]

The plates were dippesd in a 1 per cent. solution of bromine after they had set, and it was found that not only the latent image, but likewise the entire sensitiveness of the plate, was destroyed by the bath. With normal exposure no trace of an image was obtained, but the check plate was found fully exposed. A trial with a 0.1 per cent. solution gave traces of an image with a plate dipped before exposure, and the sensitiveness was apparently reduced to one quarter the speed of the original emulsion, but the same bath completely destroyed the latent image.

We thus have definite proof that bromine attacks the latent image more vigorously than the unexposed plate. Nevertheless this experiment is not a concusive proof of the sub-haloid theory, Eder[4] himself having written "that the nascent silver theory might be brought into harmony with it." In fact, I found that the 1 per cent. and 0.1 per cent. solutions of bromine, which I had used, also converted collodion emulsion negatives very rapidly to silver bromide, which could be completely dissolved with thiosulphate of soda.[5]

THE GLASGOW INTERNATIONAL EXHIBITION.

IV.—A Boom in Hand Cameras.

In seventy days the Glasgow International Exhibition has been visited by upwards of four millions of people, and there can be only one opinion expressed regarding this vast enterprise, viz., a gigantic success in every respect. Had it been possible to keep a record of the number of hand cameras that were used during the same period the figures would surprise any one, for they must have totalled up to many thousands. At no time in the past has Glasgow or the West of Scotland presented such a photographic aspect as during the last three months, and still the tourist season cannot be said to be at its height, for it is usually late in August and early in September before any great influx of tourists becomes apparent in Scotland.

Were any one to devote a spare hour or two at some of the coigns of vantage within the Exhibition (such as on the steps of the Grand Piazza), and carefully note the different forms of hand cameras that are continually passing to and fro, and being used, the task would certainly, to a photographer or dealer, prove most interesting and instructive, yielding as it would, at least, some clue as to which is the most popular of the many forms of instruments in use throughout the kingdom.

It has already been pointed out in these columns that at the previous Exhibition in Glasgow, 13 years ago, the hand camera, with

[1] Eder's "Jahrbuch," 1900, p. 80.

[2] Eder's "Handbuch der Photographie," iii., p. 68.

[3] "Die Collodium-Emulsion," von Hübl. Halle, 1894.

[4] "Photographische Correspondenz," 1899, p. 464.

[5] The treatise by Eugen Englisch, "Ueber die Einwirkung von Brom auf das latente Bild" ("Archiv für wiss. Photogr.," 1899, p. 282), did not come under my notice until my work was finished. On the whole, the results are the same. (Note by the author, dated January 14, 1901.)

perhaps one single exception, was unknown, that one form being the little Shew camera, which became so popular in later years. At that early period, however, hand-camera work was looked upon in a different light to what it is at present, the original idea clearly being to invent an instrument which could be brought into operation without any of the bystanders being aware of its presence. Hence the earliest forms of these cameras partook more of what, correctly speaking, might be termed detective cameras, a fair example of which many will remember in the circular "Stirn" or Breastplate Camera, which was capable of taking six circular pictures on one plate by means of a small lens inserted through the button-hole of a waistcoat. This was, and is still, a very good and practical form of detective camera, and, although in a large measure it has been superseded by numerous modern forms of hand cameras, there are still to be found those gentlemen who prefer for some purposes, such as copying a design from a shop window and other similar commercial uses, this undoubtedly secret method of photographing objects. From the breastplate form of detective the next step was into the hand-bag or paper parcel form of camera, and then all such disguises were dispensed with, and the modern hand camera in some shape or other blossomed forth on every side by thousands and tens of thousands.

It is only on occasions such as the Glasgow Exhibition and similar functions where vast crowds are gathered together from every part of the world that any one can form a fair idea of the multitudinous varieties of snap-shot cameras that have been invented during the last twelve years, and it certainly says a great deal for the perfection to which manufacturers have brought these instruments when it is stated that any one who sits quietly down within the Exhibition and studies the movements of the many hundreds to be seen during a fine afternoon must be forcibly impressed with the ease and sweetness with which (outwardly at any rate) these hand cameras are manipulated, for there certainly is no appearance of hitch or trouble to be seen in their working. It goes without saying that, apart from those forms of cameras carried in the hand, a great many are obviously not apparent by reason of their being concealed in a pocket or elsewhere by the user, and it would therefore be unfair to draw any comparison between this or that pattern as being more in evidence or popular than any other. Magazine cameras, however, seem as plentiful as blackberries in autumn, and no doubt a large proportion of those seen are of foreign manufacture. This must mean good business for the film and plate-makers, as well as the photographic dealer. Such a boom has certainly never been seen in Glasgow previously, where almost every schoolgirl and boy is now possessed of his hand camera. Whether this rage for the small photograph will tend to lower the tone of photography is a question that sooner or later must force itself before our different Associations. Probably, in one sense, it will tend towards assisting the professional in his particular line of work, and for the more serious requirements of trade and the household, and leave him in undoubted possession of the larger field of work. There can, however, be no doubt about the popularity of the hand camera, even in the hands of foreign visitors, of which there are a great many in evidence.

It seems strange that the Committee of the Photographic Section should not have countenanced any display of process work in the collection gathered together in the Fine Art Section. This omission has caused some comment, for there can be no question as to the progress in half-tone work during the last ten years, and such what may be termed highly essential form of mechanical work, in so far as the illustrations of books and magazines are concerned, must have proved of infinitely greater interest to very many visitors who it is well known visit such exhibitions for the purpose of seeing the progress made in our different industries, than the collection of so-called pictorial photography which the Committee have gathered together in the Fine Art Palace—a collection that cannot be deemed otherwise than old in many respects, for a very great number of the exhibits have been seen at previous exhibitions, whilst in several instances the foreign photographs shown have been published previously by means of process blocks in magazine, &c. This omission, intentional or otherwise, tends to bring into prominence in a greater degree the fine commercial display of Messrs. André and Sleigh, which is to be seen in their stand in the Grand Hall. Here are some very fine specimens of colour printing, and visitors who take an interest in photo-mechanical work should not omit to pay their stall a visit.

In the French Section, Messrs. Clement and Gilmer show an exceedingly fine collection of lenses and apparatus, for which they have become so widely celebrated, whilst Messrs. George Mason and Company have, since the opening of the Exhibition, added to their previously splendid collection a novel form of camera, made entirely of metal, which for compactness and rigidity is quite a marvel, and certainly makes any one conversant with the manufacture of cameras halt and pause over the question whether or not the days of mahogany cameras have gone beyond recall.

The Biograph displays in the Grand Hall are certainly one of the chief attractions at the Exhibition. It has been computed that these have been witnessed nightly by upwards of four thousand persons, and hundreds of thousands have gone away unable to gain admission or even to get within close proximity to the hall where the displays are given. From first to last, in the hands of such a capable operator as Mr. Cables, this entertainment has proved most enjoyable, one special feature being that the Biograph Company never permit their programme to become stale. Fresh novelties are being continually added, and the films may be termed topical, comical, and instructive. Quite recently a fine film from America was displayed, showing the various stages of incubation, and the extraordinary enterprise of the company at once becomes evident when it is stated that within forty-eight hours of any semi-private or public function of interest the scene is projected on the screen with all its realism. This was strikingly displayed the other night when the chairing of the King's Prizeman at Bisley was thrown upon the screen before the chief participant in the honour had even returned to Scotland. During the first three months of the run of the Exhibition it has been computed that Mr. Cables has passed over his rollers and projected upon the screen over one hundred miles of film without the semblance of a hitch.

The proprietors of the automatic photo machine continue doing a brisk business in the taking of portraits and groups. This has caught on, and it has come to be looked upon as quite the thing to be photographed by this machine.

So far no doubt the enormous attendance has been attributable to the phenomenal spell of fine weather that has prevailed. If any rain has fallen, it has always been on Sundays, and seemed to clear up with brilliant sunshine the moment the gates of the Exhibition were thrown open.

THE CAMBRIDGE CONVENTION.

In response to the invitation extended to them by local photographers, it has been decided by the members of the Photographic Convention to make Cambridge their meeting place in 1902. The Convention will meet about July, but, although the event is so far distant, efforts are already being put forward in its behalf. A meeting of professional and amateur photographers, and others interested in the art, was held at the Alexandra Hall on Wednesday evening, August 7, with the object of making various preliminary arrangements for the gathering. Mr. W. Sanderson (Palmer Clarke) was voted to the chair, and there were also present: Dr. S. F. Dufton, Dr. W. H. Bansall, Messrs. H. A. Chapman (Secretary pro tem.), W. F. Taylor, M. Goodrich, Butcher, D. J. Scott, C. S. Addison, T. B. Hurst, F. Stoakley, A. W. Goatcher, W. H. Hayles, E. Field, F. W. Bird, W. Tams, James Tyler, A. Howard, and M. Bellamy.

The Chairman, who attended the 1901 Convention meeting at Oxford, made reference to his visit, and, speaking of the result of the Cambridge photographers' invitation, said it gave him great pleasure to announce that it was accepted in the most hearty manner. Every one was thoroughly delighted with the idea, and seemed fully to fall in with the notion that it would be a good opportunity for comparing the two Universities. He found a number of gentlemen at Oxford who knew Cambridge, some of those who had graduated here, and others who had from time to time visited the town, and all of them semeed to look forward with the greatest possible pleasure to the visit to Cambridge. This invitation having been accepted, it was now left in their hands to formulate a Committee which should carry out the necessary arrangements. The arrangements were more or less elaborate, but he thought that when they had once formed a Special Committee, which they had better call a Local Committee, and then split themselves up into small sub-committees to undertake the various departments of the work, they would make light labour of it. He saw no reason why they should not make it a big success. The Oxford meeting was looked upon as a success, though there may have been some mistakes, which they would do well to take a lesson from and guard against. It seemed to him very apparent that a great mistake was made in organizing excursions out of Oxford. Those who had come with the object of doing serious photographic work had to give up Oxford or give up the excursions. As far as his experience went, also, it was rather unwise to split up parties any more than was absolutely necessary. The Chairman then made reference to the acceptance of the office of President of the Cambridge Convention by Sir Robert Ball, and Sir William Herschel, the President of the Oxford Convention, had congratulated them very heartily on their success in obtaining such a gentleman to act as President. He thought the best course now to pursue was to elect a Committee. As they would want about 40 gentlemen on this Committee, and as he thought they would be able to secure a large number of gentlemen connected with the University who were not now available, he suggested that they should elect about 12, with power to add to their number.

The Secretary read a letter from the Secretary of the Photographic Convention, officially intimating the acceptance of the invitation to Cambridge.

The election of a Committee was then proceeded with, and, on the motion of Mr. Goodrich, it was resolved that all those present at the meeting should serve as Committeemen.

The following gentlemen were subsequently added to the Committee:—Messrs. W. B. Redfern, Tyndall (Ely), Bolton (Ely), Wilson (Saffron Walden), and Stearn Bros. Mr. Sanderson was elected Chairman of the Committee.

The Chairman, in returning thanks, said it did not much matter who was Chairman, but a great deal depended upon who was Secretary. He believed he had found a gentleman who would undertake the work with the greatest enthusiasm. He was a University man, an amateur photographer, and a contributor to the photographic papers. His name was Mr. Sidney Johnson. He seemed keenly alive to photographic work, and he (the Chairman) had great pleasure in submitting his name to the meeting. He thought if they elected Mr. Johnson they would have a man who would enter heart and soul into the business, and help to make it a success. He moved that Mr. Johnson be elected Secretary.

Mr. Tams seconded.

Mr. Chapman, in answer to a question, said he should be unable to undertake the duties of the office permanently.

Mr. Taylor: For my part I should like to see Mr. Chapman continue the duties. (Hear, hear.)

After some discussion it was decided to defer the matter.

The Chairman, Mr. Chapman, and Mr. F. Stoakley were elected a Sub-Committee to arrange for the next meeting place.

Mr. Taylor suggested to the Committee that they might ask the Mayor for the loan of the Aldermen's Parlour for the future meetings. He thought such a request would be acceded to.

The Chairman, in replying to a question, said they were not asked to form a guarantee fund, but they were requested not to incur unnecessary expenditure.

The Chairman then declared the meeting closed, expressing the hope that those present would endeavour to bring others interested in photography to the next meeting.

Our Editorial Table.

Lantern Slides and Slide Making. By Osborne I. Yellott.

Copyrighted by the Photo-American Publishing Company, New York.

This little work is a reprint of a series of articles which first made their appearance in the "Photo-American," and there attracted our attention by their simplicity and directness of instruction, a feature which is not always prominent even in elementary text-books. The author considers first the advantages and cost of lantern-slide making, and then leads his readers by easy practical steps to the finished article, and is careful not to overload his text with a plethora of formula. The booklet is well printed, and the only point that we do not quite understand is what the illustrations, which are very pleasing, have to do with the text.

Photography in a Nutshell, by the Kernel (Lieut.-Gen. H. P. Hawkes, C.B.)

Printed for W. Tylar, Birmingham, and published by Iliffe, Son, & Sturmey, 3, Bride-street, E.C.

That this work has been accorded widespread approval is testified by its having reached its 43rd thousand, and it certainly deserves its popularity. It is not an elementary treatise in the sense that it attempts to explain in detail how to open a box of plates, how to fill the slides, and such matters, in such a manner that one absolutely uninitiated in the mysteries of photography could gather the rudimentary information he requires to start him on his photographic career, but is rather a handbook for the photographer who has passed his novitiate stage. The 150 closely printed pages are divided into chapters, which follow the usual division of subjects, and again subdivided into numbered paragraphs, each with its own heading. In the majority of cases these paragraphs really consist of brief practical articles dealing concisely with the point under consideration. This arrangement has the advantage that one has only to look up in the index the particular subject about which information is required, and the precise paragraph or paragraphs which deal with it can be at once found, without having to read perhaps half a page of words which serve only to connect one topic with another. The book is evidently the work of one who is practically acquainted with each subject upon which he writes. The author seems quite free from fads, and when he expresses his own opinion it is always a sound deduction from recognised facts. For his statements of fact he does not rely only upon his own experience, but quotes authorities from far and wide. The arrangement of the book is not conducive to redundancy of words, but the author, further, has the happy knack of going straight to the point, and, while his meaning is always perfectly clear, the matter is so condensed that he has been able to range over a much wider field than most manuals of photography are able to include. We have no hesitation in saying that there are very few photographers who would not find in the book a valuable addition to the reference library.

The Azeka Plate-holder.

Agent: A. Kennedy, 44, Great Tower-street, E.C.

The Azeka plate-holder is a simply and ingeniously constructed appliance for the purpose of holding a plate during development, so as to avoid contact of the fingers either with the plate or the developer. It is neatly made of plated wire, and the claim made for it that, holding the plate grasped firmly at three points, the plate can be safely turned about or held at any angle without fear of its slipping from the holder, we find borne out in practice. During the hot weather especially it should be found a valuable adjunct to the dark room, as its employment would prevent the incipient frilling at the edges of the negative, which it is almost impossible entirely to avoid if the negative is handled. The plate-holder is made in two sizes: No. 1 is for plates smaller than quarter-plates; No. 2 will take any sized plate from quarter to whole-plates. The price is very reasonable.

Cartol Developers.

Messrs. John J. Griffin and Sons, Ltd., have sent us, in pamphlet form, "Hints and instructions for developing with Cartols," which contains, not only the actual instructions for using their cartols, but a considerable amount of valuable information concerning the characteristics of various developing agents and the kind of work for which each is most suitable, so that the inexperienced hand should have no difficulty in selecting the particular developer which is calculated to give the best results for the work in hand. The little work is so well arranged, and the information so sound and complete, that we are tempted to quote one of the sections, choosing that which deals with the pyro-soda cartol.

Characteristics.—An easily controlled, vigorous developer. Negatives produced by it are generally admitted to be the finest for printing qualities, the slight stain being considered, by many, an advantage.

Keeping Qualities.—When mixed must be used at once. Not more than two or three negatives should be made with the same solution.

Contents of Cartol.—Smaller section, pyrogallic acid; larger section, sodium carbonate, sodium sulphite, and potassium bromide.

Directions for use.—Normal Developer.—With pyro it is, perhaps, preferable to use a two-solution developer, and to this end the contents of each section should be dissolved separately in 2½ ounces of water. Take equal parts of the two solutions for correct exposure.

Over-Exposure.—Dissolve as above, but take 1¼ ounces only (or half the quantity) of the accelerator (larger section) and 2½ ounces (or whole quantity) of the developer proper (smaller section), add also a few drops of bromide of potassium (10 per cent. solution). Gradually and cautiously increase the quantity of accelerator according to the degree of over-exposure.

Under-Exposure.—Dissolve as for normal developer, but of the two solutions take only half the quantities of each and dilute with equal parts of water. The detail should then be forced out by tentative addition of accelerator (larger section). It is convenient to keep as an accelerator a 10 per cent. solution of sodium carbonate, adding a few drops to the developer as required.

Appearance of Image and Time of Development.—The image begins to appear in one minute, and full density is obtained in from 4 to 5 minutes.

Watkins' factor No. 5.

The Planiscope Supplementary Lenses.

Manufactured by John J. Griffin & Son, Ltd.

Messrs. J. J. Griffin and Son, Ltd., have introduced a series of supplementary lenses which, as their title implies, are intended as an addition to the ordinary lens with which the camera is fitted. There are four varieties, each designed to fulfil a different purpose, designated the Tele-photo Planiscope, the Wide-angle Planiscope, the Copying Planiscope, and the Portrait Planiscope. In each case the supplementary lens consists of a single lens, mounted in a white metal mount, so contrived that it will fit the hood of the lens with which it is to be used, the combination forming an optical system either of longer or shorter focus as the case may be. The tele-photo attachment is useful when, with the original lens, distant objects are produced on a smaller scale than is desirable. The supplementary lens practically lengthens the lens, and thus magnifies the object. With this attachment the lens is lengthened in focus about one-third, thus a 9-inch focus lens becomes one of about 11¾ inches. With the

wide-angle attachment an opposite result is obtained, the focus of the lens is decreased, thus a 9-inch lens becomes one of 6½ inches. The copying attachment is intended for use when the extension of the camera is not sufficient to allow the original lens to be used for copies the same size as the original or thereabouts. In this case a 9-inch lens is reduced to one of about one-half the focus. The Portrait attachment is convenient when a head is required on a larger scale than the extension of the camera will allow. With this attachment a 9-inch lens is reduced in focus to 7½ inches. It will be seen from this description that these supplementary lenses provide a simple means of lengthening or shortening the focus of a lens, the only difficulty introduced being that the alteration will entail a rectification of the exposure value of the stop. Instructions, however, are given for this with each supplementary lens. The Planiscopes are sold either singly or in sets, and suitable for quarter, half, or whole-plate lenses. The particular purpose for which each variety is sold, of course, is only an indication of one for which it may be used. As a convenient and not expensive way of making one lens do the duties of many, the Planiscopes should appeal to those whose pockets are too light to enable them to indulge in optical luxuries.

Planiscope Competition.

In order to encourage the use of their Planiscope Supplementary lenses, Messrs. J. J. Griffin and Sons, Ltd., have organized a competition which is open exclusively to amateur photographers. There are four classes, in each of which one prize of £2 2s., and one of £1 1s. is offered. The classes are:—A, for the best picture made with the Tele-photo Planiscope; B, for the best picture made with the Wide-angle Planiscope; C, for the best picture made with the Portrait Planiscope; D, for the best picture made with the Copying Planiscope. In judging the photographs both artistic and technical merit will be taken into account. There is no entrance fee. The conditions are:—1. All competitors must be actual users of Planiscope Supplementary Lenses. 2. Negative and print must be the unaided work of the competitor. 3. Competitors may submit one or several prints (not exceeding six), but may only compete for one class. 4. Competitors must state on the back of each print submitted the following particulars:—(a) Condition of light, time of day, and date when exposure was made; (b) Stop used and focus of lens; (c) Exposure given; (d) Name of dealer where Planiscope Lens was purchased, and approximate date of purchase; (e) Class under which the competing picture is sent. 5. All prints must be made on Velox (any grade) or Carbona P.O.P. 6. The negatives from which the successful prints were made become the property of John J. Griffin and Sons, Ltd., who reserve the right to reproduce them in the photographic or other papers. 7. All competing photographs must be delivered by hand or post on or before September 30, 1901, and should be addressed:—John J. Griffin and Sons, Ltd. (Planiscope Competition), 20, 26, Sardinia-street, London.

Griffin's Snap-shot Developer.

Manufactured by J. J. Griffin and Sons, Ltd.

This developer, which is stated to be of an entirely original character, it is claimed, has the highest detail-forcing power, is free from all tendency to produce fog, does not stain the plate or the fingers, keeps well in solution, and will develop a number of plates in succession without serious loss of energy. The developer is made up in cartols, and it is also sent out in boxes containing bottles, the contents of which, when dissolved, make 25 ounces of developer. With the sample sent us was enclosed a print from a test plate made with the Chapman Jones instrument, which showed a very good result in length of scale of gradation, and by personal experiment we have satisfied ourselves that the developer is an extremely active one, and convenient in use. The negatives we obtained were of good colour and density, and their quality left nothing to be desired.

Studio Backgrounds.

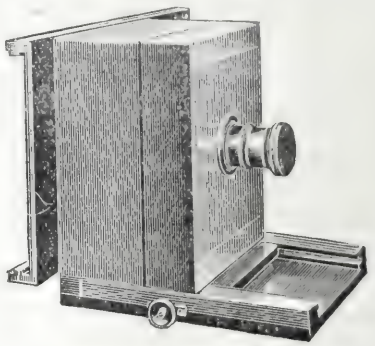
Designed and painted by W. H. Fletcher, Rosebank, Winchester.

A few years ago we reviewed the backgrounds of Mr. W. H. Fletcher, then of Bridgwater, but who has now removed his studio to Winchester, still retaining, however, an agency at Bridgwater. The numerous specimens which have been now submitted to us comprise all kinds of subjects, landscapes and seascapes, garden scenes, woods, and rustic scenery, interiors of all kinds, from the palace to the cottage, cloud effects, and graduated backgrounds for head and other studies. We recognise throughout these not only considerable artistic taste, but a vast amount of ingenuity in fitting the idea to the use for which it is to be employed. We are justified in saying that Mr. Fletcher has followed the requirements of the times very closely, and that he is evidently capable of producing work which ought to satisfy the most exigeant of the modern school of portrait photographers.

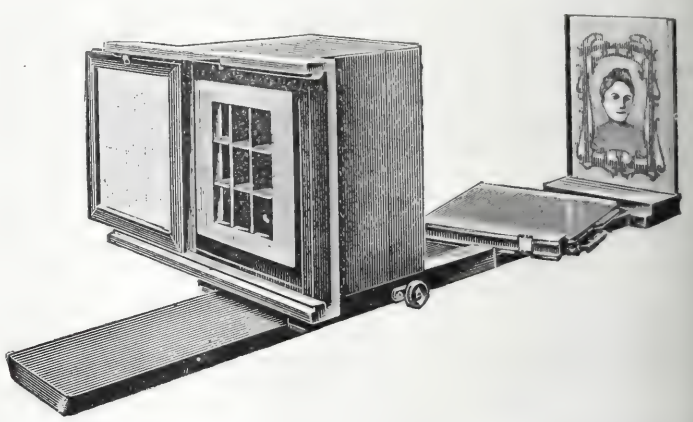
The "Aptus" Studio Camera.

Manufactured by Sharp and Hitchmough, Liverpool.

To those photographers who make it their business to produce gem, postage-stamp, or Victoria portraits, in addition to the usual larger sizes, the "Aptus" studio camera will be found to be an extremely



useful piece of apparatus at a price which is very reasonable considering its wide range of capabilities. For ordinary work, that is to say, for taking cabinets or cartes, the camera is simply a convenient form of studio camera, square, so that either a vertical or horizontal



half-plate picture may be made, and with a repeating back and slide for taking two quarter-plates. The carte or cabinet lens being removed, fittings are provided for a set of gem lenses—either 9 or 16, as required, or a set of Victoria lenses, the necessary internal arrangements of the camera being, of course, also provided for. The camera



outfit also includes a long baseboard with adjustable easel for copying. The apparatus is admirably finished, and very ingeniously designed, for, unlike most contrivances for making one piece of work do the duties of several, this performs each of its functions as well as if it were made for that sole purpose.

News and Notes.

A SPECIAL clearance sale catalogue of new second-hand and shop soiled goods, has been issued by Mr. C. C. Vevers, of 45, Grand-arcade, New Briggate, Leeds, which contains some good bargains.

MR. R. H. RISK has purchased the McKellen, Limited, Camera Manufacturing business, and is carrying it on under his own personal supervision at the old premises.

CHARACTERISED by that particular style of printing which stamps it at once as American, the price list which we have received from Burke & James, of Chicago, Ill., U.S.A., is well worth attention, as it contains many new lines which are not yet on the English market.

MESSRS. NEWMAN & GUARDIA, of 90 and 92, Shaftesbury-avenue, send us an extremely neat and dainty little pamphlet descriptive of their Nydia pocket camera, and bearing in the shape of illustrations in its pages excellent testimony as to the capabilities of this instrument in intelligent hands.

FROM the Ives' Kromskop Company of 1324 Chestnut-street, Philadelphia, we have received a pamplet descriptive of Mr. F. E. Ives's well-known trichromatic methods of photography, and the latest improvements which he has effected both in the Kromskop itself, the lantern attachment, and the cameras requisite for taking the colour record negatives.

AT St. Peter's, Eaton-square, on 10th inst., the wedding took place of Mr. William E. Downey, F.R.G.S., and Miss Jouanne Brunke, daughter of the late Mr. Conrad Brunke, of Aalborg, Denmark, and of the Danish Army. The presents included gifts from Queen Alexandra, the Princess Victoria of Wales, the Duke and Duchess of Fife, and other members of the Royal family.

SINCE the introduction of the dry plate, the literature of photography has increased out of all proportion, and since the publication of Jerome Harrison's "History of Photography," we have had no index of any note; it is therefore with pleasure that we welcome the "Catalogo delle opere di Fotografia e arti grafiche," published by Carlo Clausen of Via Po 19, Torino, Italy, which presents in concise and subject classification all works on photography between the years 1895–1901. The price of the catalogue is fifty centisemi.

ACCORDING to a contemporary, a Bill which is now under consideration in Germany will greatly interest electricians and photographers. The supply of platinum is limited. It is an essential for much electrical work, and is largely used in photography. The proposed law provides that, since it is essential to electrical work, its use in photography, where it is not essential, should be forbidden, so as not to diminish what is at best the scanty supply available for work that cannot be done without it.

INTERNATIONAL Copyright Congress.—The International Literary and Artistic Copyright Congress held its first sitting at Berne on August 8, when it discussed the preliminary scheme for the revision of the Berne Convention. After a well-sustained debate the Association decided at once to set about elaborating an ideal Convention scheme embodying all the modifications advocated by artists. The scheme will be submitted to all the literary and artistic societies of all countries with a view to eliciting suggestions and criticisms from them, so that the scheme may be recast at the next Congress at Naples.

A PARTY of Birmingham gentlemen went to Hatton the other day to play the asylum inmates at cricket, and after the match they were met by a quiet, unassuming individual carrying a camera, who asked if he might photograph them. They consented, and after some trouble were posed and the lens was exposed. After remaining in their cramped positions for ten minutes, and while wondering at the abnormal length of exposure, an official of the asylum arrived upon the scene, and walked off the operator, explaining that he was one of the lunatics who had a weakness for photography, but that his camera had no plate in it.

THE project broached by Mr. J. C. Strauss, of St. Louis, of providing at the St. Louis World's Fair of 1903 a special building for the display of photographic art is acquiring impetus, and will be discussed at the Convention of the Photographers' Association of America, which opened on August 6 at Detroit. Mr. E. B. Core, of New York, President of the Association, was in St. Louis recently. He is an art photographer, who confines his field to subjects under 14 years of age. "I shall certainly bring up the project at the Photographers' Convention," he said. "St. Louis would make an attractive departure from former expositions if it supplied a pavilion for the exhibition of art photography. The artist photographer does not deserve to be classed with the mechanical artisan. He is an artist whose pigment and brush are the sunlight. I am certain that such a departure at the St. Louis Fair would interest not alone professional and amateur photographers, but the general public as well. With the display of the highest attainments in photographic art an exhibition of the historical progress of the art should be made, showing the original ferrotype and the original camera as used in practice, and all subsequent developments. The building set apart for art photography need not be large. It should be 'top-lighted,' and the wall space should be apportioned not to photographers, but to their products. A competent jury should select and hang the photographs, and they should be catalogued as works of art are catalogued in galleries. I am certain that, if St. Louis allotted such a building to photography, the 1903 Convention of the Photographers' Association would go to St. Louis unasked."

THE British Association, which meets at Glasgow this year, is to have a new section, presided over by Sir John Gorst, which will be devoted to educational science. Among the Vice-Presidents of the new section are Sir W. de W. Abney, K.C.B., D.C.L., F.R.S., principal assistant Secretary Science and Art Department, South Kensington; Professor H. E. Armstrong, F.R.S.; and Dr. J. H. Gladstone, F.R.S. Another Vice-President is Sir Henry Craik, K.C.B., Secretary to the Scotch Education Department. The remaining Vice-Presidents are Professor Lewis Miall, of Yorkshire College; Professor John Perry, F.R.S., Professor of Mechanics and Mathematics at the Royal College of Science, South Kensington; and the Rev. G. C. Bell, M.A., Prebendary of Sarum. The new President of the Association is Professor Arthur W. Rücker, M.A., D.Sc., Secretary of the Royal Society, who succeeds Sir William Turner. On the evening after the first general meeting there will be a soirée, and, on Monday evening, September 8, a paper is to be read by Mr. Francis Darwin, M.A., F.R.S., a son of the celebrated author of the "Origin of Species." Mr. Darwin is a Fellow of Christ's College, Cambridge, where he holds a readership in botany, and the title of his paper will be "The Movements of Plants." It is announced that he will not only include the movements of such plants as the "sensitive plant," but will also deal with a much more important and more difficult question, the movements of sap in plants, which no botanist has yet been able fully to explain. On Friday evening, Sept. 13, Professor Ramsay, F.R.S., is to deliver a lecture on "Inert Constituents of the Atmosphere."

TEACHING Photography by Post.—According to the American "Amateur Photographer," the American School of Art and Photography by Correspondence was recently incorporated at Scranton, Pa. The object of the new institution is to develop and put into operation an efficient system for imparting by mail a thorough knowledge of art and photography, also the teaching of the commercial arts as applied to the production of pictures with crayon, pastel, water colours, pen and ink, or in miniature form. The American School of Art and Photography is the pioneer in the teaching of these arts by mail. The staff of instructors, directed by the eminent photographic expert, J. B. Schriever, are artists of ripe experience in their special lines. The school differs from all others in being the only institution in the world engaged in supplying the public with the products of the arts it teaches. The departments of professional photography, amateur photography, commercial arts, illustrating, &c., are all in charge of competent instructors. In constant communication with them the student is at once placed in touch with points of the greatest artistic and commercial value; saving the ambitious profitless excursions into the realm of theoretical research by immediate direction of earnest effort toward the destination of practical results by the shortest route. Apprenticeship in a studio offers meagre opportunities to an ambitious person, even after years of faithful work, as the busy photographer has little time or inclination to teach his secret processes and formulæ to new hands, preferring as a rule to depend for help on the limited supply of skilled artisans. The remedy for these adverse conditions is furnished through the Schriever system of mail instruction, employed by the American School of Art and Photography of Scranton, by which a student residing in San Francisco may secure —at home—the same effective command of photography or the commercial arts as is enjoyed by the resident of Scranton.

THE following amusing skit appeared in a recent issue of "The King":—"I've only got to look at a man once to know what he is," said the chatty individual in the misfit hat. "What am I then?" asked the landlord, who was a big, bearded man. "Come now. Size me up." "If I was to tell you the truth about yourself you wouldn't believe me," said the chatty one. "Why not?" "Too modest. But I tell you what I will do—for the price of half a pint—if you've got any photos knocking about, that is. I'll tell you all about the people that the photos represent." "Done wi' you," said the landlord. He went into the little parlour behind the bar, and presently returned with an album, which he handed across the counter. The chatty man turned over the leaves slowly and looked at the photographs with his head held askew knowingly. At last he slapped an open page with his palm. "Now, this 'ere bloke," said he. We all crowded round and inspected the photograph indicated. It was rather faded, and represented a young man of mild aspect, attired in an ill-fitting suit. "Well?" said the landlord. "First of all," said the chatty man, cautiously, "is he a friend of yours?" "No, he ain't," the landlord replied. "Relation?" "No." "I'm glad o' that," said the chatty man, solemnly. "Very, very glad, I am." "In fact," said the landlord, "some people says he's about the very worst enemy I got, that man is." The chatty man nodded, darkly. "Dislike him, I s'pose, don't you?" "Well, I dunno," said the landlord, slowly. "Shouldn't like to go as far as to say that. In fact, somehow, I can't help liking him a bit even now, in spite of all the harm he's done me." "That's 'cos you got such a generous disposition." He drew a deep breath and continued: "Now this man—and mind ye, I'm not going to mince my words, so don't think it—this man is about as bad as they make 'em. Reg'lar, rotten bad! Absolute criminal type. Look at his ears! What do they say? Notice them long lobes to 'em. See how they stick out from the 'ead. What do that denote? I'll tell ver. That denotes a mean, murderous disposition, that do." We all began, furtively, to feel our own ears and to look at those of our companions, and, if the chatty one were correct, I don't think I have been in more ruffianly society in my life. "Then take his mouth. See how the corners turn up. See? Man with a mouth like that 'd sell his own children for the price of a pot. Then his eyes. Low cunning for you there. Notice how the evebrows come down at the ends. Conceit. See that line up between 'em. Cowardice, that's what that line is. But, mind you, he's a bully, too, is this fellow. Oh,

awful! You've only got to take his nose, for instance. . . 'Ere, I say, guv'nor, what's your bloomin' trouble? 'Ere, 'old on, now." "'Ere's yer pint," said the landlord, fiercely, "and git. That man 'appens to be m—me, d'yer?—me afore I grew my whiskers." And the shattered scientist crept out into the night.

THE Camera Club.—The Camera Club "Journal" for August contains the following notes with refernce to the position of the Club:—"We publish this month a full account of the general meeting recently held at the Club. We have every reason to hope that the able and lucid account given by Mr. Percy E. Marshall, the Chairman of the Finance Committee, as the mouthpiece of the directors and committee, will be as favourably received by the members at large as it was by the representative body of members who constituted the meeting. We think it may be fairly said that with a saving of not less than £400 a year—a sum which is well within the mark—and a rapidly and steadily increasing membership, the affairs of the Club have at no time worn so cheerful an aspect as at present. We are encouraged to hope that the members, who have never been backward in supporting the Club, even when its prospects were far less promising than at present, will not fail now to come forward and lend their aid to the scheme for reconstruction. This scheme is fully detailed—so far as its main features are concerned—in Mr. Marshall's statement, and if the members generally will subscribe for the new preference shares which it is proposed to create, a very moderate average holding will (as Mr. J. W. Gordon elicited at the meeting) furnish the necessary capital required to pay off the debentures and put the Club on a really sound financial basis. We regret to announce that our popular Chairman, Mr. Andrew Pringle, contemplates—for private reasons—shortly resigning his post. Mr. Pringle, as those who were present at the meeting will know, has recently passed through a severe illness, the effects of which he is still feeling, and it was only his high sense of duty and his devotion to the interests of the Club that prompted him to take the chair at the meeting. Although retiring from the Chairmanship, Mr. Pringle's interest in the Club is as warm as ever, and he will still continue a member of the Board, and give us the benefit of his valuable advice in the conduct of our affairs. Mr. E. Ferrero also desires to take a well-earned repose from the arduous labours of the Vice-Chairmanship of the Board, and has resigned that post, as well as his membership of the House Committee. Mr. Thompson Lyon and Mr. Reginald Craigie have also resigned their membership of the House Committee, of which the former was Chairman. All three gentlemen, however, retain their seats on the Board, and will continue to take an active and unabated interest in the management of Club affairs. Up to the time of going to press, the following new members have been elected since the last list was published (in the June number of the 'Journal'):—Spencer O. Heinemann, George Coglan Watson, Hugh Greenfield Doggett, Z. William Stafford, Stephen George Longworth, George Maw, H. Powell, Louis Graham Lewis, Clive Holland, Ward Muir, Sir George Thomas Brown, K.C.B., Bryan Ellis Reynolds, Charles John Philip Cave, Colonel Harold Paget, C.B., Adam Steward Kettlewell, Harry Arbuthnot Acworth, C.I.E., George Swaton Tweedie, Lieut.-Colonel John L. Poynder, I.M.S., Edward F. Grum. In all, 54 members have been elected since January 1, of which 25 are town, 22 country, and 7 foreign members. The total membership of the Club is now 652, consisting of 270 town, 274 country, 86 foreign members, and 22 amateur mechanics."

THE Turin Exhibition of 1902.—"With request for publicatton," the following circular has been addressed to us. The delightful English of the document will raise a smile:—"The invitation to exhibit in the First International Exhibition of Modern Decorative Art, which will take place next spring in Turin, under the patronage of H.M. the King, has been most welcomed in every country where the industrial Arts are prospering. The leading Art Journals of the whole world have announced with words of praise the undertaking of the city of Turin and have published programmes and news. 'L'Art Decoratif,' a leading French magazine, devoted to the new Art, published quite a hymn to the beauty and the importance of the undertaking and to the brightness of judgment displayed in its arrangement, inciting the French artists to respond in a body to the appeal. The Parisian Committee presided over by Mr. Berger M. P. will exhibit in a special section the master-pieces of the French School. Every one understands that in an Exhibition of this kind the adhesion of England was a question of vital importance. Mr. Walter Crane, the world-renowned decorative artist, has accepted the office of English Commissary and promises to the General Committee a collection of the best works of contemporary British Artists together with a retrospective exhibit of the origins of the new style. As regards Scotland Mr. Francis Newbery, an exquisite artist and Director of the local School of Art, promises the contribution of the quaint, hardy and characteristic School of Glasgow Decorative Artists. Belgium could not fail to enter the competition. A local Committee, which is under the presidency of the young and keen art critic, Mr. H. Fiérens Gevaert, and of which is a member Mr. Octave Maus, the organizer of the 'Libre Esthétique Exhibitions' had been at work some time when the Belgian Government wished to be associated to them, so as to take part in the Exhibition in an official manner. The Austrian Government, as soon as in possession of the Programme, sent immediately to Turin the Director of the Artistic and Industrial Museum of Vienna, Mr. Arthur Hofrath von Scala, to make the necessary arrangements with the Committee, and that gentleman offered to build a villa and to decorate and furnish it with artistic objects from the Museum of Modern Art in Vienna and from local makers. Subsequently quite spontaneous and unexpected came the offer to exhibit from Hungary, that demands for her manufacturers only fifteen rooms, and many shop-windows! Our illustrious Mr. Palma di Cesnola, Director of the Metropolitan Museum of New York, promises the intervention of the Americans, guaranteed by financial means of which unfortunately we have but a faint idea in Europe. Good tidings come from Denmark, from Norway, from Sweden (where our representative is Mr. Boberg, one of the first innovators of modern architecture), from Russia, and even from the distant Japan. Great alacrity is being displayed in the erection of the Exhibition buildings, according to the projects of Mr. R. D'Aronco, the clever italian artist, who is the head of the architects of the Sultan of Constantinople. The Exhibition of Modern Decorative Art will be surrounded by several other shows together with that of 'Fine Arts' and the International Exhibition of Artistic Photography, of Wines, Oils and Alimentary Products, and all of them will stand in the magnificent, wide and picturesque 'Valentino Park' distributed in special artistic buildings, which will be the first of their kind built wth a true modern character and for an Exhibition as their special object. After many requests for extention of time reaching, the organizing Committee have extended the available time for the presentations of the application for exhibiting. (For Programme, Regulations and forms apply to the General Committee in Turin.) Such Exhibitors, however, who intend to occupy special space for exhibiting complete sets of rooms had better apply without delay as demands are numerous. The public supscription towards the Exhibition has already yielded about 750,000 fcs. and among various manners of encouragement the organizers received a solemn promise that the Ministry of Industry and commerce will destine a considerable number of Prize Medals for the Exhibitors, and will purchase the best exhibited works in order to distribute them to the R. Industrial Schools. The success of 1902 Exhibition is ensured, because it will have a powerful and singular attraction, namely that of uniting in a great city of the Italian Kingdom, full of artistic treasures and of all modern comforts, the most remarkable specimens of the production of the world in the field of Modern Industrial and Decorative Art."

FAMOUS Paintings as Models for Photographs.—The "St. Louis Republic" states that St. Louis girls are to pose as models for the reproduction of famous paintings of women by Strauss. It is Mr. Strauss's intention to reproduce some of the old and valuable paintings now hung in the European art galleries by his new lytrit process. Already one young lady, well known in St. Louis art circles, has posed as a model, and the result is that the famous "Duchess of Devonshire" painting by Gainsborough is reproduced by camera to resemble so closely an etching that it is not discernible to those not thoroughly versed in such matters that it is not an etching, or possibly a fine steel engraving. Numerous famous paintings permit of such work, and Mr. Strauss says there are many pretty girls in St. Louis who will make perfect models for the reproductions. Miss Grace Massey, of No. 3513, Morgan-street, posed for the "Duchess of Devonshire" picture. The painting, it will be remembered, was stolen soon after its production by Gainsborough more than 25 years ago. It was located in Chicago through the work of Pat Sheedy, the world's most famous gambler, who gave his word —this being sufficient—that the possessor of it would not be asked any questions, and would be paid a fabulous price if he would turn it over to Sheedy. Soon after this notice appeared Mr. Sheedy was informed of the wherabouts of the painting, and found it in Chicago. He paid for it, and asked the man who had it no questions, as had been promised. The painting was taken back to England, and J. Pierpont Morgan, the steel king, while in England recently, paid, it is said, 125,000 dols. for it. The painting is now in Mr. Morgan's art gallery. Miss Massey, in posing for the picture, did not need much make-up for the part given her. In face, if not in figure, she resembles the handsome Duchess of Devonshire very much. She has the same expression of the large, beautiful eyes, and the profile of her face could scarcely be less like that of the original. The Duchess of Devonshire, being much older than Miss Massey when Gainsborough painted the now famous picture, was, of course, more portly, this making it necessary for Strauss to do additional work in portraying the figure of Miss Massey to resemble that of the Duchess. The work was done at considerable cost, but true love of the art would not permit Strauss to hesitate at expense. It will be of interest to women to know that the hat worn by Miss Massey in the picture cost alone 50 dols. It is the famous Gainsborough hat, which became so popular soon after the recovery of the painting by Pat Sheedy. Miss Massey's hair needed but little coaxing to bring out the effect desired by Strauss to portray that of the Duchess. One of the latter's chief beauties, it is said, was her mass of blond tresses. Miss Massey is an artist. In miniature she has done much clever work, and she is now displaying true artistic ability in portraits. Among the famous paintings to be reproduced at some future date by Strauss through his new lytrit process is that of Mme. Le Brun, which is of herself and child. It is a painting of mother holding in her arms a beautiful child. The painting is now exhibited in the Louvre at Paris. For a model for this painting Mr. Strauss will select possibly one of St. Louis's handsome mothers and her child, it being necessary to have for model a woman nearing the middle age. Then there is Titian's "Flora," a handsome brunette in plain white gown, holding a huge bunch of flowers. This picture is the delight of artists visiting the Florence Art Gallery. The model, while a very beautiful girl, is not considered so pretty that a St. Louis girl cannot take her place before the Strauss camera. Joshua Reynolds's "Mrs. Siddons," posing in a tragic mood, is another that will be reproduced by Strauss. The Nell Gwynne painting, Reubens' portrait of his wife, Franz Halz's portrait of the Burgomeister's wife, Greuze's "Broken Pitcher," Sargent's portrait of a child with parrot, one of Velasquez's famous paintings, and Van Dyck's "Woman

and Child," now in the Louvre, are among the subjects to be worked up through the lytrit process, St. Louis women as models. Fred L. Stoddard and Charles Winters, both instructors in the School of Fine Arts at Washington University, have examined the portrait posed for by Miss Massey as the Duchess of Devonshire. Both were delighted with it as a work of art. Mr. Winters said, "It is one of the finest things in that class I have ever seen. Its softness of light is something remarkable. I had not dreamed that such could be done with camera. It has the quality of an engraving and an etching combined. Mr. Stoddard said, "The possibilities of this kind of work depends solely upon how it is carried out. In the first place, the conception of light, shade, and detail must be very particularly looked after, as is so successfully done with the picture of Miss Massey in the Duchess costume. It is not only artistic, but absolutely accurate, so far as likeness is concerned. I want to see more of it." Miss Massey, as an artist, was delighted. "I had not expected such work could be done with camera," she said. "Mr. Strauss and other of my friends thought I would make a desirable model for the reproduction of the Gainsborough painting, and I accepted the invitation to pose. I think the work truly wonderful, and have heard of nothing like it ever being done any place but in St. Louis."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
19.....	Bradford Photo. Society	Excursion: Heaton Woods. Leader, A. Bracewell.
19.....	Walthamstow Photo.....	Ordinary Meeting.
20.....	Birmingham Photo. Society ...	Extraordinary General Meeting.
24.....	Birmingham Photo. Society ...	Excursion: Cannock Chase. Leader, J. Page-Croft.
24	Borough Polytechnic	Excursion: West Drayton and Uxbridge. Leader, E. W. Burch.
24.....	Bradford Photo. Society	Excursion: Hardcastle Craggs.
24.....	Hull	Excursion: Brantingham.
24.....	Walthamstow Photo.....	Excursion: Kew and Strand on the Green.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MEETING August 8,—Mr. Rapson in the chair.

Mr. Brown passed round two cabinet portraits to show to what extent some professionals retouch their negatives. In these instances every idea of expression had been most carefully wiped out. A curious instance of lens reflection was also shown. This was a photograph of an organ. On the plate being developed it was found that the music and the mirror which was above the music and the keyboard had each given a ghostly reflection in perfect perpendicular order low down on the plate. Mr Brown also showed some prints on the new Paget's self-toning paper, showing the considerable range of tone that could be obtained.

Mr. W. D. Welford also showed some excellent results.

Mr. A. L. Henderson said he had obtained some very fine results by using the following bath, the prints being first put through the salt bath as recommended:—Hypo, 2 ozs.; common salt, 1 oz.; soda formate, 1 drachm; acetate of lead, 1 drachm; water, 20 ozs. He had noticed that, if the salt bath was omitted, the whites were not nearly so clear, there being a suspicion of yellowness in the high lights.

Mr. Brown, in speaking of the gold that was said to exist in this paper, said he had endeavoured to find it, and had boiled a sheet down and treated with iron sulphate, but his experiment had not succeeded.

Mr. Haddon said that, as the gold present would undoubtedly be in a very minute quantity, the test would need very carefully carrying out, and suggested it would be better to burn the paper, and then treat with muriatic acid.

With regard to the keeping qualities of these collodio papers, Mr. J. E. Hodd spoke of a certain make that had come under his notice which did not keep at all well, especially before printing, and thought this was due to pieces of thin paper which were put in contact with the sensitive surfaces to separate them. Mr. Hodd also had some specimen prints sent out by an American house last year which had in this short time completely faded, there being only the heaviest shadows left.

Mr. Brown, on the other hand, showed two collodion prints that had been in his possession for 18 years, and were now in perfect condition.

With reference to the after-keeping quality of prints in general, Mr. Henderson pointed out how some waters contained very injurious salts, and if the prints were taken direct from the washing water, and allowed to dry spontaneously, these salts would remain on the papers in such quantity as to prove deleterious to their after-keeping. Therefore he recommended that prints should have all the surplus moisture squeegeed or soaked off before hanging up to dry. They would then not only dry more quickly, but the chances of permanency would be improved.

Mr. J. E. Hodd passed round some cut films which he termed as freaks. These films were by a very well-known maker, and were manufactured in the latter part of last year. These were exposed some weeks ago, and each one developed separately with pyro soda, and it was found that all that could be developed up was a sort of transparent network with irregular deposits, and which showed very plainly that parts of the emulsion were insensitive.

Mr. Everitt said there was no doubt the fault was in the film, and due to the imperfect preparation of the celluloid before coating, this having rendered parts of the emulsion insensitive. Other members were of the same opinion as Mr. Everitt.

Mr. Brown, in reply to a challenge to produce a negative varnish that would resist water, had varnished a negative and left it in water all the evening. This was now handed to Mr. Henderson, who failed to find any trace of the water having penetrated to the gelatine. The varnish used was celluloid dissolved in amyl acetate. This must be made very thick, and spread with the finger or a stiffish brush. In the case of films it would be found best to pin them down to a rigid support, and apply the varnish as stated, and dried flat.

Mr. Haddon asked Mr. Brown if he had made any tests to prove that this celluloid varnish was absolutely impervious to water, as he would find that if a glass plate were coated, and put to soak for some time in water, the entire coating would come away, not only at the edges, but evenly all over, which proved that celluloid varnish was porous.

Patent News.

THE following applications for Patents were made between July 29 and August 3, 1901:—

COLOUR PHOTOGRAPHY.—No. 15,633. "An Improved Photographic Method of Printing in Colour (or Colours) on Paper (or other substances)." WILLIAM NORMAN LASCELLES DAVIDSON.

PHOTOGRAPHIC PAPER.—No. 15,673. "A Process for producing Paper for the Photographic Copying of Line Drawings and the like." Complete specification. HERMANN HAUCKE.

PHOTOGRAPHIC APPARATUS.—No. 15,710. "Improvements in Photographic Apparatus, and in Appliances to be used in connection with Photography." HENRY WILLIAM JAMES

PACKETS OF FILMS.—No. 15,711. "Improvements in or relating to Packs of Flat Sensitised Films for Cameras." WILLIAM BRICE GREGSON.

NON-INFLAMMABLE FILM.—No. 15,716. "An Improved Non-inflammable Photographic Film." STEPHEN GEORGE FRY.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHY AT THE ST. LOUIS EXPOSITION OF 1903.

To the EDITORS.

GENTLEMEN,—Referring again to the photographic exhibits at the St. Louis Word's Fair in 1903, kindly note enclosed reply from the Hon. Mr. Francis, also an interview with Mr. E. B. Core, President of the American Association of Photographers. I believe these two communications will interest you. I have had favourable responses from almost every prominent American photographic journal assuring support of my suggestions. I trust I may also count upon that of your JOURNAL.

It take the liberty of calling your attention to the reproduction of a portrait closely following the "Duchess of Devonshire" painting in the "Republic," which goes forward by equal mail. I believe you will find this somewhat novel, and, I trust, interesting.—I am, yours, &c.,

J. C. STRAUSS.

St. Louis, July 29, 1901.

[We are obliged to Mr. Strauss for his interesting communications, which we have abstracted elsewhere, and congratulate him upon his efforts to secure for photography at the St. Louis Exhibition of 1903 the distinctive recognition of a separate pavilion for its exhibits. We append the letter of Mr. D. R. Francis, the President of the Exposition Company:—"It seems to me that the proposition to set apart a separate pavilion for photography will be justified by the great advancement made in the art, and by the widespread popular interest which attaches. The matter is one to be considered officially by the Executive Committee or Committee on Grounds and Buildings, to which your letters and Mr. Wilson's letter have been referred. Both the Chairman and Vice-Chairman of that Committee are out of the city at present, and it is not possible to get definite action upon your proposition until they return. I think you will be entirely justified in saying to the Photographers' Association of America at the Detroit meeting that the Directors of the Louisiana Purchase Exposition recognise the importance of the photographic display, and will endeavour to meet the wishes of the Association so far as may be practicable. I sincerely hope the Photographers' Association of America will be induced to hold the Convention of 1903 in St. Louis."—EDS. *B.J.P.*]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

Thomas Clegg, Photographer, Rawtenstall. *Photograph of "Opening of Whitaker Park, Rawtenstall."*

Philip Daws, 55, High-street, Dorking. *Photograph of water-colour drawing of "Dorking Old Market House," eighteenth century.*

William Richard Albert Dobbs, 34, Bridge-street, Hindley, near Wigan. *Photograph of "First Volunteer Active Service Company, 1st Battalion, Loyal North Lancashire Regiment."*

PICTURE-FRAMING.—"FRAMING" asks: "Could you give me the address of wholesale houses for picture-framing?"—In reply: Such houses as Marion's, Houghton's, &c., supply frames in wholesale quantities. You can also see the advertisements in the ALMANACS and the JOURNAL.

TITLES IN PRINTS.—"VIEWS" asks for the best method of printing the name on a view on P.O.P.—In reply: Print it on the negative, and then it will appear in all the prints. A convenient way of doing that is with the "Nameit," supplied by the Nameit Company, 44, Snow-hill, E.C.

BINOCULARS.—L. MELDON asks: "Can you kindly tell me whether the new Zeiss or the new Goerz binoculars are the best, and if there is any other maker of better? Who is a good authority on the subject?"—In reply: Both instruments are good. It is against our rule to pass an opinion on the comparative merits of different makers' goods.

STRIPPING FILMS FROM GLASS.—R. M. ADAMS asks: "Will you kindly inform me if in any of your BRITISH JOURNAL PHOTOGRAPHIC ALMANACS I can find out how to remove the film from the glass of a cracked plate? What year and page, and if you have not got it in any of your ALMANACS could you give any information about this?"—In reply: A method is given on page 960 of the ALMANAC for 1900.

ADDRESSES WANTED.—E. J. WALKER writes for the address of English firms who publish chromo-lithographs or photos by the three-colour process, and if any of them are public companies in which shares could be obtained?—In reply: The London Post Office Directory contains the addresses of publishers of chromo lithographs, and also whether they are limited companies or not. If they are, it is probable that shares are to be obtained in them.

ADDRESS WANTED, &C.—J. S. B. asks: "(1) Name of firm or firms who make penny-in the-slot machines of all kinds? (2) What is the difference between guncotton and pyroxyline?"—In reply: (1) We presume you mean photographic penny-in-the-slot machines. Mr. G. Wurtz, of Hamburg, is showing one at the Glasgow Exhibition. He will doubtless supply you. (2) By the term "guncotton" the explosive kind is generally understood. By "pyroxyline" the soluble kind, as employed for collodion.

BROMIDE PRINTING MACHINE.—R. W. W. writes: "Can you oblige by informing me if there is any really good machine on the market for printing and developing bromide paper, automatically or otherwise, in spools of 20 to 30 feet? I am acquainted, I think, with what apparatus there is on the English market, but perhaps you could give me information as to anything German or American? Any address of firms making machines of the above description would be welcome."—In reply: Marion and Company supply such a machine. We do not know of any foreign firms that do so.

STAINS ON ENGRAVING.—E. G. W. asks: "Will you kindly inform me the best means to remove a yellow stain on an engraving evidently caused by condensation inside the glass, the wet getting on the engraving, and leaving a yellow stain?"—In reply: There are different ways of removing the stains, and they are all based upon the bleaching action of chlorine. But space in this column will not permit of our giving such practical details as would be of much use. If the engraving is of value we should advise that the work be entrusted to an expert who makes a speciality of cleaning and restoring engravings, as an inexperienced hand may, possibly, ruin the picture in attempting to do the work.

REVERSED NEGATIVES.—P. BARRAUD writes: "Mr. Newton in his article on carbon printing speaks of an easy way of making a reversed negative by contact. Where can I find particulars as to development, &c.?"—In reply: No doubt the method referred to is to place the negative in contact with a dry plate and expose to light sufficient to bring about a reversed action of light, and then develop with the ordinary developer, well restraining with bromide. The more satisfactory method of making reversed negatives is by taking them, in the first instance, by the aid of a mirror or prism, or by placing the plate in the camera with the glass side towards the lens.

COPYRIGHT.—J. P. MILNES writes: "In this month's "———'s Magazine" is a reproduction from one of my photographs you made copyright for me about two years ago—"S.S. Bathori" stranded in Larbrax Bay. As my permission has not been asked, have I not a good case against the proprietors; and, if so, can you advise me how to proceed in the matter?"—In reply: Certainly you have, and should recover substantial damages. Put the matter in the hands of a solicitor, preferably one who makes a speciality of copyright laws. As the magazine has a large circulation we should say your best way would be to proceed for penalties for each copy printed.

CAMERA—SPEED OF PLATES.—W. STAPLEY writes: "(1) I have a quarter-plate Frena, and the stops are on the 'Universal System,' numbered 8, 16, 32, and 256. Please tell me how they compare with the ordinary *f* ratio? (2) Could you kindly give me an idea of the speed of Austin Edwards' instantaneous films, in comparison with Paget XXX or XXXXX?"—In reply: (1) The numbers marked on the stops are the ordinary *f* ratios. (2) By reference to the table on page 690 of the ALMANAC you will see that, by the Watkins' plate speed list, the Edwards' instantaneous films are given as 60, the Paget XXX as 70, and the XXXXX as 100. Personally, we have not compared them, the one with the other.

COPYRIGHT.—"COPYRIGHT" asks: "(1) If A photographs B and views of his house without remuneration from him, and A copyrights the same and C publishes them with B's consent, despite A's claim for fees, can A claim on C for his fees? (2) Also, what is A's course to adopt to obtain same? (3) Does not the Copyright Union protect him? (4) What is the subscription of membership to the Union?"—In reply: (1) If the copyright is A's, B cannot give permission for its infringement. The remedy is for damages against C. (2) Proceed against C. (3) Yes, if you were a member, it would proceed for you. (4) Communicate with the Secretary, Photographic Copyright Union, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

A POSTAL DIFFICULTY.—"AVAIL" says: "I had a hand camera which I wished altered, so I forwarded it (by parcels post) to maker's, and, after waiting for a period of about a month, and yet no answer, thought I would write asking them about same, which I did, and in reply to my letter they say that they cannot remember seeing camera, and cannot trace it. I have not got the date that camera was sent, so what can I possibly do?"—In reply: If the parcel were registered the postal authorities could possibly trace it, or prove delivery. If it were not, and you cannot give the date it was posted, we do not see what you can do. It seems a pity that you allowed so long a time to elapse before you made inquiry about the camera.

GOVERNMENT APPOINTMENT.—"BASILIKON" asks: "(1) Could you kindly give me information as to posts open to photographers under Government at home or abroad, with particulars as to special qualifications required, &c.? (2) Also, are the posts of photographers to the public hospitals and asylums open to general competition, and in what way, or through which medium, can a knowledge of vacant posts in such institutions be obtained?"—In reply: (1) The greater portion of the Government photographic work is done by the military—the Royal Engineers—and the men are instructed by their superior officers. (2) We are not aware that the posts are open to competition. Most of the work is done by a member, or members, of the medical staff in the hospitals.

COPYRIGHT.—"COPYRIGHT" says: "Six years ago I took a photograph of a public gentleman, which I made copyright. Some two years ago the gentleman died. I have recently discovered that a photographer in another town copied my photograph, and produced a large quantity of same, which was 18 months ago. My photograph bore my name, but not the word 'Copyright.' Should I have any claim against the photographer for infringement, considering that my photo did not bear the word copyright, and that it has been 18 months since he made the copies?"—In reply: It is not necessay that the pictures bear the word "Copyright." If the copyright is yours, you can proceed against the photographer for damages. We do not think the lapse of time will bar an action, but it may tell something, perhaps, in the mitigation of damages. An action should have been commenced before.

FERROTYPE DIFFICULTY.—"FICTI DEVELOPER" writes: "Will you kindly oblige with your opinion as to what is the cause of enclosed ferrotype dry plate) pictures being so flat, as, whatever the exposure given, results are same? I am using the 'Nodark' camera, also Fallowfield's special developer, but this is the best result out of 50 plates, and no matter how long I leave them in the developing solution I can never get sufficient density. I had far better results with a small quantity of developing solution which I had from the 'Popular' Photo Company, New York, but I cannot get any more in England, it seems, without waiting a long time. I presume there must be something in the American developer quite different to our own—i.e., English. As a last resource I have been advised to appeal to you, as you will be more likely to give a reason and a remedy for same than any one else."—In reply: We are sorry we can give you no assistance, as we do not know by what formula the plates were prepared, or what is the composition of the developers you have employed. We should suggest that you send an example to the makers of the plates. Those sent us are very unsatisfactory, and we cannot in any way suggest the cause.

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EX CATHEDRÂ.

Burning Metals as a Source of Heat.

A most interesting Friday evening discourse on this subject at the Royal Institution was given early in the year by Professor Austen Roberts, and incidentally some data which should be of interest to photographers were given in it. Professor Roberts said he would have little to say about the light which attends the combustion of metals, and dismissed the subject by a familiar application of the burning of metals for the purpose of illumination. He explained the mode used in warfare for illuminating large areas of country by exploding shells with magnesium parachutes. We may extract from his lecture some particulars of the heat produced in burning some metals familiar to photographers, the only part useful for the especial purposes of our readers. We learn that one gramme of magnesium gives out in burning 6000 calories, but aluminium in the same quantity has a still greater heat output, viz., 7250. It is remarkable how much in excess of any other metal these two give out heat, the next lowest in the list being nickel, with only 2200 calories, though carbon when burnt into carbonic oxides gives off 8080 calories. It is easy to understand from these figures why magnesium is so valuable as a source of light, great light being usually associated with great heat. Of course, there has to be taken into account the fact that magnesium readily burns in air, while with all the rest it is less easy to produce combustion unless reduced to an extremely fine state of division. Aluminium, however, has frequently been recommended as a substitute for magnesium, and, as the figures quoted would appear to indicate, with advantage. The form most useful for the purpose is the so-called aluminium bronze, and where, as is now often the case, the combustion is brought about by oxygen, there would appear reason to believe that the light produced by its aid should be superior to that from magnesium.

* * *

The Cheapest Form of Light.

According to "Nature," the paper on this subject, which appeared in the "American Journal of Science" last August, has been reprinted and published as No. 1258 of the Smithsonian Miscellaneous Collections, with a note pointing out some of the additions to our knowledge of the light from living and mineral sources during the last ten years. It will be remembered that the paper deals with the light of the fire-fly, and shows that the insect produces light without heat, so that its efficiency as a light source is far higher than any artificial means of illumination. In connection with this subject the luminous bacteria cultivated by Mr. J. E. Barnard and Professor Allan Macfayden, and shown at the last Royal Society's conversazione, are of interest.

* * *

The Planet Venus as a Source of Photographic Light.

Some little time ago we referred to the announcement that Dr. W. R. Brooks had produced photographs by the light from Venus, some portraits having been stated to have been so produced. In the current number of the "Century Magazine" Dr. Brooks describes the results he has obtained, and the article is illustrated with a portrait obtained by this light; but the actual means adopted in its production are left to the imagination of the reader.

At the same time data are given sufficiently interesting to the photographer. Thus we have photographs which are simply prints obtained by printing on a dry-plate through a negative by Venus light, due precautions being taken to prevent the access of any extraneous light. These pictures were taken soon after September 17 last, at which time Venus was a morning star. The speed of the plates used is not given, but the exposures are stated to have been from 30 to 45 minutes. To obtain a print on bromide paper the exposure was protracted over five consecutive days during the presence in the heavens of the planet.

* * *

Photography for Determining Celestial Positions. Usually eye observations have been mainly relied on for the most exact results, but lately M. Lœwy has been investigating Professor Turner's method by photography, and he gives his result in a report now being published. The position of the planet Eros is one of great interest to astronomers, and 58 observatories have been making photographs. Up to January 6 not a single night had elapsed since the beginning of the work without one or other of the observatories obtaining a negative. On good nights over a hundred were obtained.

DIFFICULTIES WITH NATURAL BACKGROUNDS.

The photographer who lays himself out to undertake an all-round practice, such as is frequently required in what may be termed scientific work, in contrast to the now generally accepted term pictorial photography, has often to face subjects that require no small amount of thought regarding the best, and, indeed, often the only possible means of overcoming difficulties which stand in the way of producing such results as are required for special purposes; for what may be termed scientific photography is, without doubt, a class of work that far transcends the mere pictorial representation of any scene or subject, such as landscape or seascape studies; and it would indeed be difficult to enumerate a tithe of the advantages which photography has conferred on science and commerce, apart from mere pictorial representation, for we see its aid and value as a truth-recording agency in almost every industry as well as science. This advantage is very marked in the means now employed for illustrating books and magazines, with such objects as are quite beyond the power of the artist to provide with pen and pencil. This is exemplified in thousands of instances by means of photo-mechanical printing in one or other of its different forms, which may, with truth, be said to have revolutionised within recent years the method of illustrating educational books, as well as illustrated periodicals and magazines. Even architects are now found discarding all their old-fashioned methods of producing copies and designs of structural and other subjects for that of photography, although the rendering of them by means of photography entails much trouble and cost, as well as danger by photographing structures from giddy heights, and almost inaccessible standpoints. Perhaps there is no one better able to form a correct idea of the marvellous application and capability of photography in regard to industry and science, than the process block-maker, who, when he comes to look back upon the multitudinous variety of subjects that have passed through his hands in the course of a single year, simply stands amazed at such productions, and may well exclaim, "What would the world now do without photography?"

Many photographers look upon the removal of faulty backgrounds and surroundings as a matter of easy accomplishment, and that they are of no great moment when photographing an outside subject, for they trust to their skill in blocking out such portions of the negative as are undesirable, and without further thought proceed to expose their plate upon what they see before them. In common practice and with some subjects this procedure may work well enough, but in high-class scientific illustration, where absolute truthfulness in form and structure is a sine qua non, there must be no tampering with outlines or other portions of an object. What, it may be asked, would be the value of some microscopic specimens in which the edges and outlines were completely destroyed by brush and pigment? Why, no professor or teacher would for one moment tolerate such a method of illuminating a faulty background or other portion of such a subject. So also with numberless other subjects in scientific work, the form and structure down to the most minute detail must be faithfully preserved, and whatever means have to be resorted to, blocking out, certainly, is not to be thought of for a single moment. Apart, however, from this fatal objection to blocking out, there is also the fact that in many instances subjects will be presented that offer insuperable difficulties in the way of blocking out, or any mechanical alteration in the negative, and when this happens, then a photographer has to set about conjuring up some means of getting over the difficulty, which to some may seem insuperable, unless they have been trained specially up to this particular class of work. In botany, for instance, we have a science where form and structure is of paramount importance, and any illustration that did not faithfully convey every detail in such would certainly be condemned by those having to do with the selection and acceptance of such illustrations, for they are frequently relied upon for teaching and ocular demonstration, and, strange to say, it is in this science of botany that a photographer is most of all likely to find himself face to face with subjects that frequently offer the greatest amount of trouble. A brief description of what may be termed a case in point may help to yield to the readers of The British Journal of Photography some idea of the difficulties a photographer has to overcome without resort to blocking out. A photographer of our acquaintance not long ago was asked to provide suitable photographs for reproduction of a fine specimen of a monkey puzzle, known in botany under the name of Araucaria. The mere photographing of such a tree in itself was, of course, a matter of no difficulty; but, in the case in question, the tree and its surroundings were in such a position as to make any result obtained in the ordinary way of procedure quite valueless from a botanical point of view. What was desired was that a photograph of the araucaria should be provided that did not display any semblance of other trees in the background, which in their natural position interfered to some extent with the point of the object it was particularly desired to delineate in the illustration. Therefore, some means had to be devised whereby this could be achieved; of course blocking out was not to be thought of, and the uprooting and destruction of the trees in the distance was out of the question. On carefully thinking the matter over, the photographer hap-

pened to remember that once he photographed when on tour with a caravan, a party of travelling tinkers, or as some erroneously call them gipsies. This group was sitting by the roadside lolling over a wood fire, which being somewhat freshly prepared was throwing off a goodly quantity of smoke, which hung in heavy masses by reason of the dull, damp atmosphere that prevailed at the time, and it suddenly occurred to him that this peculiar effect of the smoke might be utilised in the case in question. So he determined to try the experiment on the first suitable evening. This meant waiting for a still, calm afternoon, with a somewhat heavy, sluggish atmosphere. So a quantity of garden rubbish, mingled with a fair sprinkling of damp hay was provided and placed in readiness at a suitable distance between the trees in the background, which it was desired to obliterate, and the araucaria in the foreground, which was desired to form the chief object in the photograph.

In selecting a lens for this particular sort of work, it was evident on the face of matters that the most suitable instrument for the purpose would be one which was capable of being used so as to yield the least amount of penetration, or as some wrongly term it, depth of focus. Every portrait photographer is well aware that portrait combinations, when working with full aperture, yield very little definition beyond one plane; and, therefore, seeing in the particular subject before us. it was inadvisable to employ a lens capable of defining beyond the plane in which the araucaria was situated, a portrait lens was highly suitable for the work on hand. A twelve-inch portrait combination was therefore selected as the most suitable. After waiting several days for suitable atmospheric conditions, which meant an almost total absence of wind, patience was rewarded, and towards evening preparations were made to take the photograph. A light having been applied to the heap of damp hay and garden rubbish, large volumes of dense smoke soon filled the air behind the araucaria, and when such appeared most suitable the plate was exposed, and one of the best possible results was secured. Now-a-days what is wrongly termed depth of focus in a lens is looked upon as one of the greatest points in favour of such instruments. Practical experience, however, has taught many workers that the much maligned portrait combination possesses many good points, for there are occasions when much penetration is a positive disadvantage in photography, which embraces a good deal more than is meant by pictorial or snap-shot work, and there are occasions when it is desirable to pourtray objects situated as nearly as possible on one plane only. It does not follow, however, that in every case of this kind resort must be had to the providing of what may be termed, in a sense, artificial atmosphere, for occasions will arise when practically the same results may be achieved by what may be termed purely lenticular means. It is under such circumstances as these that the valuable properties of a portrait combination come into play, for with its wide range of angular aperture, it confers a great power when properly used in the hands of photographers. In scientific photography there are innumerable little difficulties which can only be grappled with by those of a resourceful turn of mind; experience, no doubt, goes a long way to help one over many a stile and difficulty; as a rule, however, there is always some way of overcoming these, and not infrequently the simplest way proves the best.

THE INSTABILITY OF PAPER.

When treating on the subject of the permanence of photographs, space last week would not permit of dealing with the subject of the paper itself and its stability. Many papers, as most of us know, are liable to change under the action of light, and in some instances the deterioration of photographs is not so much to be attributed to the photograph itself as to the paper upon which it is supported having become discoloured. Some of our older readers will doubtless remember the correspondence there was some twenty or so years ago in these pages with reference to some carbon pictures which were alleged to have faded. We well remember seeing some at the time that had been long exposed in a showcase, and they had, unquestionably, undergone a marked change from what they were at first. The lights had become a brownish-yellow, somewhat like the yellowing often seen in albumen prints.

It was, however, soon proved that it was not the carbon image that had suffered, but the paper upon which it was. It had become discoloured by the light's continued action, and assumed a dirty yellow tint. In a word, the paper used was sensitive to light, a thing, at that time, unsuspected by those who employed it. This fact having been discovered, it was, of course, remedied in the future by the selection of papers of a more stable character. Later on it was found that the yellowing of some bromide pictures was entirely due to a similar cause—the paper having changed—and not to an alteration of the image. The paper now made expressly for photographic purposes is of a less alterable character than that supplied some years ago.

At one time paper, except the common brown paper, was made exclusively from rags—linen and cotton—and very stable they were. But at the present time rags are but little used in its manufacture: Esparto grass, wood pulp, old paper, &c., all being largely used in place of rag, with often the introduction of mineral substances, such as clay, to add to its weight. The paper most prone to change under the action of light is that made from wood pulp, and with some kinds with a very brief exposure. If we take a sheet of what is known as "wood pulp middles," such as often form the interiors of photographic mounts, and expose it to the sun, with a portion of it masked, a marked change will be seen, even in a few hours. If a freshly planed deal board be treated in the same way, the result will be similar. If some of the common tinted papers, upon which the halfpenny evening newspapers are printed, be exposed to sunlight for a few hours they will have the pink tint discharged; the tinting matter used to disguise the common quality of the paper, in some instances, being of an extremely fugitive nature. We have been told that in some eosine is employed as the tinting medium.

At the present time nearly the whole of the paper used in photography emanates from two, possibly three, continental firms—the Blanchet firm at Rives and that of Steinbach in Malmedy—and makers of photographic papers here and elsewhere are compelled, for the most part, to draw their supplies of the raw material from those sources, and pay somewhat high prices for them. The present makes they issue are, however, good and tolerably stable. It seems almost a reproach to English paper-makers that the manufacturers of photographic papers have to get their raw material from two or three foreign firms; but so it is. The only explanation of that fact, so far as we can learn, is

that British paper-makers are so fully occupied in the production of their "regular thing" that they do not care to go out of their way to experiment with the view of making an article specially suited for photographic purposes.

Apart from the paper itself, there is another thing that may, and at times does, affect the change—not fading—that is sometimes seen in photographs. Most of the papers used in the gelatino-chloride and the collodio-chloride processes are surfaced—baryta coated, as it is termed. This surfacing, it may be mentioned, is for the most part also done in Germany. Now the sulphate of baryta, *per se*, may be considered an inert substance, but it has, of course, to be secured to the paper by some colloid body, such as gelatine, starch, or flour paste, &c. As all the printing-out papers contain a certain amount of free nitrate of silver, and when the emulsion is applied to the paper some of this free silver combines with the cementing medium, a silver compound is formed, which, if not removed in the fixing and washing of the print, remains, and may, and often does, become affected by long exposure to light. This may frequently account for the darkening of gelatine prints referred to in the article last week.

We were recently told by a friend who, when experimenting with the collodio-chloride process, coated several samples of surface papers, from the same bottle of emulsion, to test their keeping qualities. The papers were all stored in the same parcel, but at the end of two or three weeks one or two of them had become much discoloured, while others retained their whiteness for months. This difference in their behaviour was clearly due to the coating on the paper, and not in any way to the emulsion, as all was from the same bottle. One curious fact was that the paper that kept its whiteness the longest was one of a very common quality, and not intended for photography at all, but for collotype printing. However, it proved useless for the purpose tried, inasmuch as the paper foundation was of such a rotten nature, when wetted, that it would not go through the operation of washing after fixing without tearing. We have, we think, said enough to prove that where a photograph may change in tint, by prolonged exposure to light, that the reason is not always to be attributed to the process by which it was made, for it may be, and sometimes is, due to the paper on which it is produced.

JOTTINGS.

Edinburgh Castle towers above me as I recall my photographic experiences of the past few days. It is not the first time that I have sat, pencil and note-book in hand, in those delightful gardens off Prince's-street, where one may rest awhile to the music of that soothing hum of traffic which so delighted the heart of Charles Lamb. I have been sailing on the Forth for some days. Between this wide arm of the sea and the placid little river near Windsor Castle, where so many of my nights and days are passed, there is a world of difference. The distant hills and rocks; the ever-looming Forth Bridge, that responds to the searching power of my prismatic binoculars almost, it seems, down to the Bass Rock and North Berwick, though the eye entirely fails to "pick it out;" the smoke of the Forth-side towns and villages, the bracing air, and the strong winds, these are the chief impressions of my Forth experiences that strike me, an old river-haunter and one never happy away from the water-side, be it salt or fresh. The Edinburgh tripper, more fortunate than his Cockney confrère, may get to the seaside for a few pence in a few minutes, and for an additional shilling or two can be taken on a day's cruise over ozone-laden waters, and be back again in the heart of the city by early evening in time for tea. The Forth, so to say, winds past his very front door. I have said that that magnificent lace-work of metal, the Bridge, ever looms over the Forth. It is a Godsend to the photographers at Aberdour, Portobello, and other places hereabouts. Each studio seems to have a Forth Bridge background. The photographs in which the latter appears are interesting subjects for analysis. A very popular piece of "composition" is a boat in which the sitters are placed as if rowing, the Forth Bridge being in the "distance." The obvious artificiality of the accessories, and the sublime contempt for the laws of perspective which the photographs decidedly evince, provoke a smile. I do not know that I have seen "naturalism" so unsparingly sacrificed on the altar of "realism" as in the case of this and many other specimens of "natural" backgrounds that I have recently inspected in the local show-cases. One heroic subject deserves special mention. The photograph shows a young man of the working class, dressed in his "go-to-meeting" clothes, and leaning gracefully on a gun-carriage, the business end of the weapon being legibly labelled "Long Tom." At the foot of this peaceful-looking instrument there is a heap of property cannon-balls, said to be "pills for Kruger." In a corner of the picture a sign-post boldly points the way "To Pretoria." I pass my compliments to the author of this striking piece of work. It is by such simple, but effective means, that photography asserts itself as an agency that is capable of arousing and sustaining the martial spirit of our brave defenders.

That kind of professional photography which appeals to the poorer classes is so widely diffused over the whole country, and is at the same time so hopelessly bad in quality, that, as one who looks forward to the day when intelligent people will no longer be content with such productions, I cordially congratulate all concerned on the organization of the Pictorial Photographic Section at the Glasgow Exhibition. If I am not mistaken, this section will have a great educational effect. Up to the time of writing some six million people have passed through the Exhibition, which, speaking in general terms, is a complete success. A deluge of rain swept over Glasgow last Saturday whilst I was at the Exhibition, and this unfortunately robbed me of the opportunity of seeing many of the principal features. But I did not miss the pictorial photographs. This gallery, in which the exhibits are arranged according to nationality, is a distinct personal triumph for Mr. J. Craig Annan, whose firm's name appears at the photographic souvenir stall the moment you enter the Exhibition building, and again in the grounds where a Kiosk, designed by Mr. Walton, I believe, is devoted to the same purpose. Excluding some "commercial" portraits which I suppose could not be refused, and one or two irredeemably stupid American things, of which Mr. Edward J. Steichen's "self portrait" is the stupidest, the collection represents the world's best photographic work of the past few years. What interested, what impressed me, while I was in the gallery was the presence of the public in large numbers, who scrutinised the photographs as if they really appreciated them. I have never in the whole of my exhibition experiences seen such masses of people deeply interested in the photographs. I have always held that of good photographs, the cream of the principal London and country exhibitions, the people at large were painfully ignorant. They do not go to photographic exhibitions, or buy illustrated photographic annuals or periodicals. The chance snapshot, or the glazed print in the show-case or the shop window, represent to them all that photography is capable of doing in the way of artistic expression; and it is this state of ignorance which is responsible for the fact that people are content to accept as portraiture, work which those of us whose daily round places in contact with the latest achievements of pictorial expression in portraiture look upon with some impatience. Other pens have dealt critically with the photographic section of the Glasgow Exhibition. To me the display appeals in one particular aspect. It differs from the photographic section at Paris, in that it is given the dignity of separate recognition in a special gallery, and thus for the first time in history millions of visitors are afforded

the opportunity of seeing in a collected form the best that photography so far, is capable of producing. Surely such an innovation should help on that "upward movement" of which I wrote last week? I remember a passage in an address delivered by Mr. W. Crooke over two years ago, in which that distinguished worker said that there was an increasing demand for artistic portraiture—that is work a cut or two above the show-case kind. If the photographic section of the Glasgow Exhibition stimulates that demand, the labours of Mr. J. Craig Annan and his associates, whom I again heartily compliment on the success of their efforts, will be well rewarded. By the way, a suggestion has been made that a souvenir of the Glasgow Photographic section should be published. Photographers in all parts of the world will no doubt appreciate it.

It has been my good fortune to be the guest for some days of that fine photographer, Mr. W. J. Croall, a perfect type of the true amateur, who combines with an almost passionate love of animals, the qualities of a thorough sportsman and a highly accomplished photographer. Who does not know Mr. Croall's series of "Sporting Dogs at Work?" To meet Mr. Croall in that mood when the portrayal of animal life is the immediate object before him, is to witness a concentrated enthusiasm of purpose, which could not fail to exhilarate even a person so phlegmatic as I have heard a certain Editor is said to be. I shall not easily forget a certain incident of which Mr. Croall was the central figure a few weeks ago. The herd of fallow deer at Magdalen College, Oxford, had been gathered together in order to give him the opportunity of photographing the shy and beautiful creatures. A luncheon appointment had been previously arranged. The important hour had long since passed. Mr. Croall was all absorbed in his work, absolutely oblivious to everything but the immediate object before him—that of photographing the deer. The pangs of hunger began to make themselves felt in other and less intensely enthusiastic members of the party. No matter. They and the world were dead to Mr. Croall. Then an Emergency Deputation of One swooped down upon him and hoarsely pleaded that the luncheon was getting cold. All in vain. My friend Mr. Croall meant to "see the thing through"—and did; seriously, he was fascinated by the deer and the opportunity of making the photographs. Of course, even such an incident, in which the chief actor literally quivered with the excitement of the "chase," ultimately reached its termination, and the luncheon was eaten in due course in the old Bishop King's Palace, where some of us were staying. I rake up this little incident for the purpose of illustrating Mr. Croall's thorough-going earnestness in his work—a trait not too common amongst amateurs, or professionals for that matter. To know the man, to live with him as I have done, to "survey" photographic "mankind from China to Peru" in his company is to appreciate the splendid type of photographer that he is. Men of his rare stamp, by their example and by their work indirectly help the "upward movement" amongst professionals, for by their assiduity and thoroughness they teach the lesson that good work is only to be achieved by the expenditure of pains, study, and effort. If every little professional would take this lesson to heart instead of foolishly grumbling at the amateur and the "harm" he does he would greet him as an undisguised blessing. Which, indeed, the cultivated amateur, typified by Mr. Croall, undoubtedly is, take my word for it, ladies and gentlemen of the profession!

Stodginess! A gifted lady friend in Edinburgh, and a well-known photographer at present holiday making in France, both realise the supreme expressiveness of this word. Stodginess! Photographers, amateur as well as professional, are too apt to go through their work in a dull mechanical way, content to follow in the groove that was traced for them by their predecessors. They "stodge along" in fact, content to shirk the small intellectual effort necessary to "strike out a path of their own." It is owing to sheer stodginess that the existence of Forth-Bridge-background-glossy-portraits of uncomfortably posed soldiers and female domestics is offered to, and accepted by, such vast numbers of the public as modern photographic portraiture. To stodge through a profession, as to stodge through life, is to throw away the chance of getting the best that can be got out of it. There is a plague of stodginess abroad in the land. It is killing professional photography. What is needed is An Anti-Stodgers League. If my lady friend would accept the Presidency of it the success of the movement would be assured. "Beware the 'Stodgy Push,'" writes my French photographic friend—French only *pro tem.*, for in reality he is a go-ahead Australian. On that point I will say no more, lest I betray his identity. And here, reverting to the photographic section at Glasgow, may I, in concluding this "stodgy" paragraph, append the hope that it, too, will be of service in assisting to stamp out photographic "stodginess."

The "land of the Croalls," as Edinburgh in some of its aspects always seems to me to be, is commanded by the beautiful and not too large Craigcrook Castle, the seat of the head of the family, whither the Fates, which are uncommonly gracious to me just now, took me one night last week. To the best of my recollection Mr. Douglass Croall, who did the honours with an affability, the fame of which has spread far South of the Tweed, does not publicly exhibit his photographic work, many specimens of which it was my privilege to see; but of his very marked ability in translating to photographic printing paper the subtlest effects of cloud, sky, and landscape, some really splendid examples were shown to me. I shall not draw aside the veil from a little function, in which I was honoured by being one of the guests in a party of six; it is one of those happy recollections that mere type cannot do justice to. Craigcrook Castle, only a portion of which is modern, dates back some hundreds of years, and contains a room sacred to the name and memory of Lord Jeffrey, in the same state and condition as when that noted man resided at the Castle. The Heffners, the Sam Boughs, and the other pictures excite my envy, and I cast covetous eyes on the other rare objects of art in this tasteful Midlothian palace of the well-respected Croall family. But only for a moment! There is something even more rare, to my thinking, which is mine, without allowing myself to commit the barren sins of envy and covetousness. It is the frank welcome, the cordial good-will, the lavish hospitality of which I am made the fortunate object. Could the most exquisite material product of artistic hands and brains adequately replace all this? I think not. What a magnificent bond of sympathy photography must supply when it leads to the honours, the free and open interchange of thought, and the excellent good-fellowship which I have experienced these last few days!

Cosmos.

THE FIXATION OF PLATINOTYPES.

When dealing in our last issue with the question of the permanency of photographic images, we commented upon the permanence of platinotypes, and pointed out that traces of chemicals left on the paper would have some considerable influence on the resultant stability of the print; it is therefore unnecessary for us to apologise for calling attention to a brief article by Dr. Jacoby of Berlin in the current volume of Eder's "Jahrbuch," and as it opens up a field for experiment which can be easily traversed by any practical platinotype worker, we cannot do better than translate it.

Dr. Jacoby points out that many old platinotype prints show a more or less yellowish tinge in the high lights, and that this is particularly noticeable on rough-surface papers, and that whilst this slight yellowness may not be by any means a disadvantage from an artistic point of view, yet, as great stress is generally laid upon purity of the whites, it is as well to prevent this discoloration as far as one can.

The yellowing is frequently ascribed to a gradual decomposition of the "blueing" of the raw paper by the action of the light; it is principally, however, caused by traces of platinum salts. In making this statement, we think that Dr. Jacoby has overlooked the fact that "blueing" of the raw paper has been abandoned for some time, at least in England. That all ultramarine blue papers will gradually yellow in time, particularly when treated with hydrochloric acid, is a factor which has long been known both in photographic circles and in the paper trade.

Dr. Jacoby also points out that this yellowing has been ascribed to traces of basic iron salts, a theory which we believe was advanced with some considerable weight by Mr. Chapman Jones, and partly disproved, or combated at least, on experimental grounds by Mr. A. Haddon, who showed that the traces of iron were discoverable even in the raw paper without the application of any platinotype sensitising solutions. As rather supporting the argument that traces of iron are not always the cause, and that platinum may be, Jacoby states that when two pieces of paper are coated, the one with the normal lead-iron sensitiser for the cold-bath process, and the other with plain chloroplatinite of potash solution, the former can be fixed out absolutely clear with a hydrochloric bath, whilst the latter shows a distinct yellow tinge, though both may have been carefully kept in a calcium box, and that, moreover, the latter, that prepared without an iron salt, will after some months be a deep brownish yellow.

In connection with this we would point out that some of the platinum salts have an extremely strong coagulating action on gelatine, and that this action may have to be considered in connection with the sizing of the raw paper. Though against this view Jacoby states that he has noticed the yellowing to be independent of the preliminary sizing of the paper, and ascribes it to the action of damp upon the extremely attenuated film of platinum salt—a view which is also supported by the well-known fact, which has been lately confirmed by some researches upon the stability of gold and platinum solutions of various concentrations, in which it was shown that the more dilute the solution the more rapidly was the noble metal reduced to the metallic state.

However, laying on one side these purely theoretical considerations, Dr. Jacoby comes to a conclusion with which no one will quarrel, and that is that the present method of fixing platinotypes is unsatisfactory, and that whilst it is possible to obtain pure whites it is not advantageous to use those means which will give them, such as strong hydrochloric baths, nitrites, chloride of lime, &c., because these attack the sizing of the paper itself.

Jacoby had already pointed out (Eder's "Jahrbuch," 1897) that platinotypes were cleaner in the whites when, after the usual hydrochloric bath, they were treated subsequently with the alkalies of the fatty acids, such as the oxalates, citrates, &c. Of the salts tried, the citrate and oxalate of ammonium proved to be the most satisfactory, and the latter was adopted because it was cheaper than the citrate, but as ammonium oxalate is in itself a faint developer, it is advisable to fix the platinotype print, as usual, with two normal hydrochloric baths, and then to treat it with a five per cent. solution of ammonium oxalate for a quarter of an hour. For the ammonium oxalate solution it is essential to use distilled water, as when hard water is used a copious precipitate of calcium oxalate is formed.

By this treatment finer whites are obtained than by the ordinary method, but even with this, says Dr. Jacoby, it is impossible to remove all traces of platinum salts, and there is no known perfect fixing agent.

THE OPTICS OF TRICOLOUR PHOTOGRAPHY.

[A paper read before the Royal Photographic Society and reprinted from its "Journal."]

BELIEVING that the true principles of tricolour photography are those given to us by Professor Clerk Maxwell, and not those so persistently advocated by Mr. Ives, the following paper contains mainly evidence on which this belief is founded.

Under the date January, 1860, with the title "The Theory of Compound Colours," the "Transactions of the Royal Society" contain Professor Clerk Maxwell's quantitative evidence of the formation of all colours, from the admixture, in different proportions, of three spectrum colours.

In awarding to Professor Maxwell the Rumford Medal for this paper, Major-General Sabine, the then Vice-President of the Royal Society, said,* "The researches for which the Rumford Medal is awarded lead to the remarkable result that, to a very near degree of approximation, all the colours of the spectrum, and therefore all colours in nature, which are only mixtures of these, can be perfectly imitated by mixtures of three actually attainable colours, which are the red, blue and green, belonging respectively to three particular parts of the spectrum."

The following year, May 17, 1861, Professor Maxwell lectured at the Royal Institution on the same subject, and demonstrated as an application of his researches, a system of colour photography in which photographic images, taken through three coloured solutions of sulphocyanide of iron, chloride of copper, and ammoniated copper respectively, were subsequently superimposed, by projecting them with three magic lanterns, through the same coloured solutions.

It is much to the point to notice that in indicating to us the application to photography of the knowledge gained in his researches, Professor Maxwell entirely departed from the method he, and he alone, had given us, for the formation of all colours by the admixture of three spectrum colours, as shown diagrammatically in his curves and so clearly referred to by Major-General Sabine.

Some years afterwards (1869) Monsieur Louis Ducos Du Hauron, being then unaware of Professor Maxwell's previous work, invented the Photochromoscope, the Tricolour print system of synthesis and other applications of tricolour photography, and in his book, "Les Couleurs en Photographie," published his mode of working. This was the same as Professor Maxwell's, that is to say, he employed for his positive analysis the same filters, red, green and blue, that he used for his chromatic synthesis.

Mons. Chas. Cros and later others, including Professor Vogel and Baron Hübl, also gave similar methods.

In 1888, Mr. Frederic E. Ives, of Philadelphia, published in the "Journal of the Franklin Institute," and subsequently in pamphlet form with the title, "A new principle in Heliochromy," a different sytem of working. This system consists briefly, in the application of Professor Maxwell's spectrum work to photography; that is, a photographic analysis in strict accord with Maxwell's spectrum curves, and a photographic synthesis in equally strict accord with Maxwell's spectrum primaries.

During many years past, Mr. Ives, backed up by his Kromskop results, the undoubted excellence of which, we have been led to believe, is due to the adoption of his so-called new principle, but relying entirely on Professor Maxwell's spectrum work for his scientific support, and without, so far as I am aware, a single definite experiment, to confirm or otherwise the accuracy of his views, has actively proclaimed himself the originator of the only correct optical system of practical tricolour photography, and discredited and condemned as rubbish the system employed by Professor Maxwell, Ducos du Hauron, Vogel, and others.

Mr. Ives' recent Traill Taylor Memorial Lecture delivered in these rooms, is a fair sample of his treatment of the subject; he has also lectured, unquestioned, to the same effect, at nearly all our leading scientific institutions, and the "Ives' principle" has now, I believe, been copied into every text-book on the subject in the English language, as the correct guide to practice.

We may well pause and ask ourselves, *why* one of the most accurate investigators and thinkers of modern times, Professor Maxwell, seeing, as he undoubtedly did, the co-relationship between these colour schemes as clearly as we see the relationship between the different parts of a four-legged table did not himself indicate to us the use of his spectrum curves, in conjunction with his spectrum primaries, for photography, but on the other hand, used the same group of rays both for analysis and synthesis; also, why the inventive genius, Louis Ducos du Hauron, to say nothing of others, followed in the same steps as Maxwell.

Before attempting to give a satisfactory answer to this question, it will be advantageous to examine the practical working of the two systems.

It has already been shown* by Baron Hübl, that the methods of Du Hauron, Du Cros, Vogel, &c., are in practice substantially the same, and I have shown† that these gentlemen's methods are in their

* "James Clerk Maxwell and Modern Physics." By Professor A. T. Glazebrook, F.R.S. (Cassell & Co.)

* BRITISH JOURNAL OF PHOTOGRAPHY, March 18, 1898.
† *Ibid.*, March 8, 1901.

turn also substantially identical with Professor Maxwell's; we can therefore pass on to Mr. Ives' practice and compare it with Maxwell's.

It will be convenient to divide the examination into two sections:—

First, the two systems of analysis.

Second, the two systems of synthesis.

Taking, in the first place, the two systems of analysis, the one Maxwell's with three solutions of ferric sulphocyanide, copper chloride, and ammoniated copper respectively, and the other Ives', with Maxwell's curves. Sets of Maxwell's three solutions were prepared, and adjusted as to correct strength with the aid of a Maxwell's colour box, that is to say, they were rendered identical in colour and visual purity with his three spectrum primaries—the essential condition laid down by him in his lecture at the Royal Institution referred to. The quantities resulting were as follows:—

No. 1.

Cupric sulphate (pure cryst.)	120 grains.
Ammonia ·880	120 minims.
Water (distilled)	4 ounces.

Used in a cell of quarter-inch section.

No. 2.

Cupric chloride (pure cryst.)	5760 grains.
Water (distilled)	20 ounces.

Used in a cell of one-inch section.

No. 3.

Ferric sulphocyanide (pure cryst.) ..	stock solution,	240 grains.
Water (distilled)	„	20 ounces.

The last named diluted when required as follows:—

Stock solution (No. 3)	360 minims.
Water (distilled)	4 ounces.

and used in a cell of quarter-inch section.

Four sets of Ives' filters were employed for comparison with Maxwell's, supplied under Mr. Ives' instructions, to four different firms or persons, and at widely different times.

The following tests were made:—

I.—Visual test.
II.—Spectroscopic tests.
III.—Camera tests.

I.—*Visual Test.*

For the purpose of this test, the colours of the commingled rays contained (with approximately proper intensities) in each of Maxwell's curves, were ascertained with the colour box, and found to be orange, greenish-yellow, and blue respectively.

The colours of Mr. Ives' filters were not found to compare with this orange, greenish-yellow, and blue, the colours they should conform to in accordance with his teaching; they were, however, found to be the same in colour as Professor Maxwell's three solutions, not so pure, but otherwise the same.

II.—*Spectroscopic Tests.*

Again, the Ives' filters showed no evidence of Maxwell's curves, or any similar curves, with the exception of the green filter, whose action falls off towards the blue in a somewhat similar manner to Maxwell's curve; on the contrary, they give three practically isolated bands, identical with those given by Maxwell's three solutions.

It should be remarked also that the falling off of transparency towards the blue, in the case of the green filter, may be required, quite independently of the Ives' principle. This would be the case when using ordinary plates, or imperfectly sensitive orthochromatic plates, for tricolour work, and when owing to the rapidly increasing sensitiveness of the plates, from a point usually commencing in the middle green, towards the blue, it becomes essential to reduce the quantity of blue-green rays acting to compensate for the greater sensitiveness of the plates to these rays.

The theoretical defects introduced by the weakened action of the blue-green when using plates as per Mr. Ives' instructions would be the conversion of blue-greens into blues and violet-blues in the case of positive synthesis, and into blacks in the case of colour prints. A direct and careful experimental test, with a colour chart containing various shades of these colours, with the Ives filters, as against the Maxwell filters, showed that these are defects characteristic of the former.

Similar remarks and confirmatory evidence may be made and given in reference to Mr. Sanger Shepherd's filters. Mr. Sanger Shepherd, I believe, supports the teaching of Mr. Ives, but his analysis filters are adjusted by means of a special form of sensitometer, and apparently without reference to the Maxwell curves. Two sets of these have been tested, and there is no evidence in their spectrum records in support of Mr. Ives, or to suggest the Maxwell or similar curves; on the contrary, they give practically identical records as those given by Professor Maxwell's three solutions, and undoubtedly owe the excellence of the results they give to this identity; therefore it may be said that, in his practical work, Mr. Sanger Shepherd is accumulating evidence of the correctness of Professor Maxwell's teaching.

Again, with the American Carbutt filters similar results were obtained, and whatever degree of accuracy they give is due to their rough approximation to Professor Maxwell's three solutions.

In all these tests the plates used were those to which, according to the instructions issued with the filters, the filters had been adjusted.

III.—*Camera Tests.*

The photographed spectrum tests, being in themselves conclusive, and the comparisons of the results in practical tricolour work, when using the Ives principle, as against the Maxwell system, having already been published in an article contributed to The British Journal of Photography, February 1, 1901, and the defects arising from the employment of the former fully pointed out, they are not included here. They, however, fully confirm the accuracy of Professor Maxwell's system.

The Two Systems of Synthesis.

Taking in the second case for consideration the two systems of synthesis, the one Maxwell's and the other Ives', it will be found on reading through Mr. Ives' definition of the principles of successful tricolour photography in his recent Traill Taylor lecture, that his condition of success, as regards synthesis, is the use of Maxwell's simple spectrum primaries. This same condition is also claimed for Mr. Ives as one of his specifications in the report of the scientific experts to the Franklin Institute, whom he has so frequently referred to in support of his claims; but directly the practical standpoint is reached Mr. Ives drops this condition of success and his own specification.

The synthetical primaries employed in the Kromskop and in the Ives triple lantern were found greatly inferior in purity, but substantially the same in their useful ray composition as the Maxwell three-solution primaries. The only explanation I can find of this departure of Mr. Ives from his own teaching is contained in the handbook to the Photochromoscope, page 15, and it to the following effect:—

"Photochromoscopes were first made with screens of very pure colour in order to realise every theoretical requirement, but people imagined the productions to be more strongly coloured than the originals. Owing to the prevalence of this error of judgment, it has been found permissible to compromise by a slight reduction in purity."

It may be remarked that this slight reduction amounts to the substitution in the case of the green, for example, of two-thirds of the entire spectrum for a single narrow band.

To sum up these various tests we may recognise that it is hardly possible to conceive anything more directly opposed to the tenets of his teaching than Mr. Ives' own practice as exemplified by his analysis filters and synthetical glasses, and without attempting to criticise these departures from his own first principles, enough has been said, whatever the reasons may be, to indicate that in doing so he has adopted the system of Professor Maxwell.

It will now be convenient to point out the true relation which our photographic processes bear to Professor Maxwell's spectrum work and the Ives principle. In the synthesis of colours in which Maxwell's curves formed the basis, three narrow bands of practically homogeneous rays were used as primaries, but this homogeneity of ray composition is not essential to retain the colour of the primaries; on the contrary, the spectral rays comprising them can form broadened portions of the spectrum, providing the rays added from one side of the homogeneous primary are balanced with a suitable quantity from the other side; and, as readily shown with Professor Maxwell's colour box, his three homogeneous primaries can be matched, without sensible loss of visual purity, by three commingled bands of spectrum rays, comprising together nearly the entire spectrum. Further, these broadened or compound primaries, having this maximum luminosity, are substantially identical, in their ray composition, with the rays transmitted by Maxwell's three solutions, as also with the rays reflected by pigmentary primaries of maximum luminosity.

Directly these broadened primaries are applied to the reproduction of compound, that is, natural colours, the Maxwell spectrum curves no longer represent the proper proportions for the formation of other colours, but for every degree in which the primaries are broadened, a different set of spectrum records are required, the suitable records, as the primaries are widened, becoming shorter and overlapping less. This goes on until the primaries contain the maximum number of useful rays, and are similar in composition to the rays transmitted by Maxwell's three solutions. Under these circumstances the spectrum records representing the most perfect reproductions both in hue and luminosity values have no longer any overlapping portions, and their limits of action correspond also with the rays passed by the three solutions. This may be summed up by saying that Professor Maxwell's three solutions, in the practical sense, occupy the same position and fulfil the same functions for the reproduction of natural colours, by means of primaries of maximum luminosity, as his curves do, in relation to his simple spectrum primaries.

There are two broad applications of the tricolour principle in photography, the one positive synthesis, as exemplified in triple lantern projection, and the other invented by Louis Ducos du Hauron, negative synthesis, in which colour prints are obtained by printing with the complementary colours to the primaries. Of these two broad applications, the latter will generally be regarded as vastly the more important, *provided always that the colour prints can be viewed in ordinary white light.* This essential condition excludes the use of narrow spectrum bands, and necessitates the employment of compound colours, which are complementary to primaries having the maximum luminosities, in other words, complementary to the rays passed by Maxwell's three solutions. Also in positive synthesis, where it is conceivable narrow bands of colour approaching Maxwell's spectrum primaries might be used, we have the recognition by all workers, including Mr. Ives in his practice, of the advantages derived from the use of primaries of maximum luminosity.

This condition then being recognised, the problem at once resolved itself into the production, in the photographic analysis, of records which represent the proper proportions of primaries having maximum luminosities, required for positive synthesis; and this consists, as indicated to us by Professor Maxwell, in the employment of the same rays for analysis as for synthesis.

We can now offer an explanation as to why Professor Maxwell did not himself suggest to us the application of his spectrum curves to photography. *The truth is, that as a matter of fact, they do not touch the subject, as they cannot usefully be dealt with in practice*—they have exclusive reference to the use, for synthesis, of three narrow bands of spectrum rays, for the purpose of a scientific verification of the theory of compound colours, and have no known application in practical tricolour photography.

On the other hand, if starting in ignorance to ascertain the most correct method of practical photographic analysis, we take different paths; each choosing the one, according to our idiosyncrasy, the most likely to lead to the best system; whether like Du Hauron we let our theory go hand in hand with our practice, or whether we follow Dr. Vogel's principle, or Baron Hübl's colour scheme, or whether we adopt the trial and error system, of the practical operator; or like Mr. Ives, endeavour to make a system of our own—by the time we arrive at the best results, all the evidence at our disposal at the present time points to the method being substantially identical with that orginally indicated, in 1861, by our great countryman, Professor James Clerk Maxwell.

HOWARD FARMER.

FROM A CAPETOWN DUSTHEAP.

IT was early one morning as I passed along one of the principal thoroughfares of this half-civilised, half-barbaric, and almost wholly dirty city. The daily pandemonium had begun. From the direction of the Docks, puffing and panting came a lumbering traction engine with its tail of trailers piled high with sacks of corn and bundles of forage for the use of the troops, and for a while all other traffic near the railway station was blocked as the huge serpent winded and wended its way in the direction of the Castle. The station was already vomiting forth its crowd of workers, and, round about the massive post office, newsboys were rushing to and fro, shouting "'Times!' 'Argus!' mail edition!" as they thrust the sheets under the noses of likely purchasers, whilst a number of poorly-clad, barefooted coloured youngsters hung about in hopes of picking up a stray coin. Near by a refuse-cart was collecting its load. Outside a large building an undersized half-coloured man staggered under a big box, and mounting a ladder prepared to tip the contents of his burden into the cart. Prepared to tip them is the proper expression, for as the collection of waste papers was yet in mid-air, a sudden whirl of the rising south-east wind for which Capetown is famous, caught them and whisked them along. Influenced by gravity, the larger particles fell first, and I just managed to dodge a piece of heavy cardboard that threatened my eye, which told me, as my head ducked, that I just missed being blinded by a photographic mount. The lighter particles swept further afield, long wisps of trimmings of prints curled round the sticks and clung in the folds of wayfarers' clothing, whilst bits of prints, mounted and unmounted, were chased and eagerly collected by the small urchins, some of the bolder of whom scrambled on to the cart, and ere the sleepy-looking driver could raise his whip had jumped off again, and were away in various directions, each with a bundle of despised pictorial fragments clasped tightly to his breast.

In common with others who had been assailed by this shower of studio sweepings, I congratulated myself that the rubbish was of this mild description only, and if I gave the matter another thought, it was only to bless the wind for not carrying about bits of the glass that I heard rattling into the cart, a not impossible thing to happen in this alternately sun-burnt and rain-soaked, but seldom wind-free fag-end of the Dark Continent. Later in the day I chanced to pass along one of the less-frequented byways in the poorer quarter of the city, and happened on a group of small coloured and part-coloured fry in garments of various and dilapidation sitting round a few boulders that the rain and a neglectful Town Council had left of what was once a roadway, busying themselves with what must have been the diamonds from the débris I had seen scattered, or else treasures sifted from some similar clean-up. So intent were they on their occupation, that for some time they failed to notice my presence. They were piecing together the bits of spoilt prints as the children of more favoured classes do the puzzles provided for their pastime and amusement, pieces which had very often been torn apart with a wilful view to prevent their subsequent identification it would seem, for whilst clothes, buildings, *etcetera*, might be left whole, scarcely a face was to be seen that had not been ripped in one or more directions. Glee and delight, impatience and surprise, congratulations and bickerings were freely exchanged as they jabbered away in Oom Paul's beloved *taal*, "that beautiful language yet in its infancy," as a rebel friend of mine once called it, but which I persisted was a low, vulgar, never-to-be-too-much-condemned kitchen-and-alley conglomeration of low Dutch, vile English, and worse Kaffir and Hottentot. A vignetting mask cut out of a spoilt print had been pieced together and stuck with strips of P.O.P., and the comical appearance of a huge hole surmounted by a small helmet and supported by a long pair of booted and spurred legs raised a peal of merriment, speedily hushed

as they discovered my presence and prepared to move themselves and their treasures away.

"He's all right, my mother does his washing!" said a small boy. I capped his remark with the promise of a tickey to buy "lackers" if they would exhibit their treasures. Confidence reigned, and from out of ragged shirts and dresses came forth whole and partial solutions of their puzzles, joined up by sticking at the back of them bits of gelatino-paper strips. Many of the prints were in platinotype, evidently not bromide, as some discarded sweepings testified. "No good that, it won't stick," they said contemptuously of the yellow and grey strips. Why some of the prints had found their way to the rubbish heap was plainly evident. With others the case was different; one could only conjecture they were proofs not approved of or cared about, for the work was of no mean or second-rate order. I got interested.

Khaki, khaki, everywhere. What a lot of khaki. Khaki busts, khaki three-quarters, khaki full-lengths, khaki cabinets, khaki cartes, khaki panels. Single khakies, double khakies, groups of khaki. Soldiers in khaki, bugler boys in khaki, nurses in khaki, sailors in khaki. Lords in khaki, commoners in khaki. Last and by means least in number, Town Guards in khaki. Ha! ha! ha! It is an ill wind that blows nobody any good. The merchant, the clerk, the tailor, the draper, the candlestick-maker, the porter, and the office-boy all joined the Town Guards, but not necessarily for the khaki, although they got it. I am not laughing at *them;* not exactly. They were prepared to fight if the town was threatened, and the move did release the Regulars to fight at the front where they were most wanted. No, dear Town Guards, I am only laughing at the pomps and vanities of this wicked world. For when you got your khaki, then, encouraged by your sweethearts, your wives, and your children, you marched gaily forth to the photographer's. You faced the wild beast in his den, you mounted guard in his torture-chamber, you faced his lenticular gun. Unwincingly you heard the click of his shutter's trigger, and knew that your soul's shadow was his for evermore. He gave you his cartridges and in return you nobly paid him your shot. So be it. There was joy amongst the knights of the camera, the men of the velvet hood. And when you sought him, not in his lair, but, emboldened by numbers, called him out into the open field, there you stood rank behind rank, your officers where they should be in the fore-front, and each and all of you with arms in hand; little you feared the three-legged monsters, but smiled dauntlessly as you thought of the vacant spot, not *by* your fireside, but *over and above it.*

And the ladies. Surely this is Lady So-and-so, and here too is my charming hostess of Blank Villa. Here is a portrait of a lady's hat with a face underneath it, and here is Mrs. Stay-at-home with her last twins, in all the glory of "nodings on"—the twins I mean, not the lady. Here are two simpering imitations of Miss N——, the famous actress; had to be, I suppose, and the photographer had no say in the matter. Here is pretty Miss ——. "I say, boy, I'll give you a penny for this." She will snort when she sees it on my mantel on a bright new mount with the joints faked out and the missing bit faked in, and perhaps that photographer may have a lively quarter of an hour, so I think to myself.

The parting of an extra penny on my part raises glorious visions of prospective trade amongst my entertainers. "Lord Roberts a shillun," says ore gamin, as he thrusts two crumpled scraps before me. Smart boy that, he knows he has a prize. I demur. "Sixpence," says the lad. "Only a tickey," is my reply. "A soldier might give me more," is the answer. "If he was drunk perhaps, or maybe he would take it for nothing and kick you into the bargain," is my reply. That settles it and the photo is mine. For a few trifling sums I purchase sundry other spoils, portraits of public characters and a few private ones. I secure, without having had to cadge for them, portraits of two of my friends, and I do not scorn to part with the magnificent amount of one halfpenny for the mutilated effigy of mine enemy. Three halfpence gives me a not-too-much-damaged portrait of a certain wealthy Lord, whose reputation is a little more damaged than the portrait, together with young ——; but stop! I am not writing for a Society paper, or for the columns of "Truth," and I had better keep literally to my subject, and not figuratively scribble down "From a Capetown Dustheap" all the rubbish and unsavoury things that might be raked therefrom.

"Dar kom a denah on. Haat loop!" ("Here comes a policeman. Run away!") My entertainers are round the corner. So is the policeman—the opposite corner. "Better not stay round here, sir!" says the latter, "you might be taken off to the plague contact camp if I meet a case here." So I go; but I think it not unlikely that my washerwoman's boy may give me a call for further trade purposes.

SCIATHERAS.

PSEUDOSCOPIC VISION WITHOUT A PSEUDOSCOPE: A NEW OPTICAL ILLUSION.

PROFESSOR R. W. WOOD sends the following note to *Nature*:—A method of securing an illusion of binocular vision wholly without instrumental aid occurred to me recently, which is interesting in connection with the study of pseudoscopic vision. It is fully as startling as any of the results obtained with the lenticular pseudoscope, which I showed at the Royal Institution in February, 1900, and which I shall speak of presently, and, requiring the aid of no optical instrument, is much more impressive.

A lead pencil is held point-up an inch or two in front of a wire window screen, with a sky background. If the eyes are converged upon the pencil point, the wire gauze becomes somewhat blurred, and of course double. Inasmuch, however, as the gauze has a regularly recurring pattern, the two images can be united, and with a little effort the eyes can be accommodated for distinct vision of the combined images of the mesh. To accommodate for a greater distance than the point upon which the eyes are converged requires practice, but the trick is very much easier in this case than in the case of viewing stereoscopic pictures without a stereoscope.

As soon as accommodation is secured, the mesh becomes perfectly sharp and appears to lie nearly in the plane of the pencil point, which still appears single and perfectly sharp. If now the pencil is moved away from the eyes, which are to be kept fixed on the screen, it *passes through the mesh and becomes doubled*, the distance between the images increasing until the point brings up against the screen. If now the pencil be removed it will be found that the sharp images of the combined images of the gauze persist, even though the eyes be moved nearer to, or farther away from, the screen. Bring the eyes up to within six or eight inches of the plane in which the mesh appears to lie and attempt to touch it with the finger. *It is not there:* the finger falls upon empty space, the screen being in reality a couple of inches further off. This is by all means the most startling illusion that I have ever seen, for we apparently see something occupying a perfectly definite position in space before our eyes, and yet if we attempt to put our finger on it we find that there is nothing there.

It is best to begin by holding the pencil an inch or less in front of the screen. As the eyes become accustomed to the unusual accommodation, the distance can be increased. I have succeeded in bringing up the apparent plane of the mesh five or six inches; but this requires as great a control over the eyes as is necessary in viewing stereoscopic pictures without an instrument.

The pseudoscope, which I have alluded to above, I have described in "Science" (about November, 1899), but inasmuch as the description of it which I sent to "Nature," the editor informs me, was never received, a brief account of it may not be out of place. Two lenses of about three inches focus are mounted in front of a pair of stereoscope lenses in such a way that the real inverted images formed by them in space can be combined by the stereoscope. The lenses should be mounted in sliding tubes attached to the frame of the stereoscope, so that proper focussing can be accomplished. This instrument has been named the lenticular pseudoscope by the psychologists, and gives results far superior to those obtained by the Wheatstone and other forms of mirror pseudoscopes. Viewed through the instrument, a hollow bowl appears as a beautifully convex dome, and if a marble be dropped into it we witness the astounding phenomenon of a ball rolling up hill, crossing the top, descending part way down the other side and then returning to the summit, in defiance of the law of gravitation.

Johns Hopkins University. R. W. WOOD.

AUSTRALIAN PHOTOGRAPHERS AND THE ROYAL TOUR.

Our contemporary, the "Australian Photographic Journal," which is published at Sydney (N.S.W.), remarks, apropos of the presence of the Duke and Duchess of Cornwall and York in Australia, that the Royal party all told were exceedingly obliging to photographers wherever they went, and readily submitted to the dictates or desires of the operators who, at the close of nearly every public and party function, besieged them with rather more than a dozen machines, every one of which was directed toward the group. On several occasions it was positively amusing to watch the antics of the craftsmen formed in a line at either side of the Royal personages, each edging one before the other in anxiety to procure the best view, and snapping their shutters as though every moment was absolutely the last; while the click, click, clicking of the latter reminded one of a company of infantry firing a feu-de-joie. Royal commands to take portraits of the Duke and Duchess were issued to several of the leading photographers in each State, but no studio was graced by Royal tread, as at all times the chosen seat of operation was Government House, and outdoor pictures preferred. Some of the portraits taken on these occasions distinctly characterise masterly, if not expert handling; showing that moderate adverse conditions are obstacles of little moment to the thoroughly practical photographer when he really lays himself out to do best work. Of those photographers in the various States favoured to pose their Royal Highnesses were Messrs. O'Shannessey, "Talma" and "Falk," Melbourne; Farell and Poulsen, Brisbane; "Atelier," "Falk," "Swiss," Charlemont and "Crown" Studios, Sydney. So far as we are at present informed, official order for copies has alone been issued to Mr. J. Brooks Thornley, who submitted an assortment of autotypes and sepias made from seventeen negatives and tastefully mounted on cream plate-sunk vellum mounts, which appealed to the Duke and Duchess, with the result that copies were ordered from fifteen of the seventeen negatives.

In the same number of our contemporary the following interesting notes upon the part played by photographers in the Royal progress are given:—"Whoever complains of the interruption to the continuity of business induced by the celebrations it certainly will not be the photographic material merchants, for they were kept going the whole time. To say that the city was full of cameras would be mild; some parts were, during the life of the wave of excitement, literally packed with them. Every conceivable make of camera and every commercial size of plate, as well as some sizes that are not commercial, were to be seen. No need had one to ask the question, 'Where do the immense quantities of cameras go to?' Their appearance in such numbers answered the query in anticipation. It seemed as though half the populace had come armed with them, and the number of plates and films sold and exposed must have been almost beyond calculation. The perfect weather on the day of the landing of the Royal party was in itself a temptation to point the lens at anything that was in the smallest degree characteristic; the great drawback to all, except those who were in elevated positions, was the obtaining of any view of the pageant that was worth recording.

"Whilst waiting his turn at the unique Queen Victoria arch, on the Sunday morning preceding the Royal entry into the city, one well-known photographer counted no less than fifty-four cameras pointed at the arch at one time, and the number on Prince's Bridge on the same morning is said to have been far greater. Many, however, reserved their plates for Monday, preferring to make their negatives of the various arches when these structures had been decorated with their last piece of war-paint. Having heard of the great rush the previous morning, I was curious concerning the appearance of the city at daybreak on the Monday; so, wrapped in a great-coat (for it was a sharp morning) thither I bent my steps before sunrise, and even at this early hour there were cameras to be seen; the owners having come thus early were waiting for the first gleam of light, in order to escape the rush which was expected to set in between 8 and 9 o'clock. Some were already doing their best to arrange their subjects on the ground glass by the aid of the arc lights by which the city is illuminated, so as not to lose a moment when the light should peep over the top of the Dandenong Range. In fact, speaking in a general way, cameras were, during the term of the celebrations, an unmitigated nuisance.

"Plates exposed on the arches on Monday morning were developed at once, and mounted prints from them were freely exposed for sale in the city during the afternoon. I do not know whether this is to be considered a record or not under the circumstances, but, considering the time of year, it must come dangerously near to the top notch. Whole-plate prints, on P.O.P., mounted, at one shilling each, from negatives taken the same morning could not be growled at by the ordinary purchaser, who is ignorant of the fugitive nature of the prints hurriedly put through a combined bath, and tormented with as little washing as possible preparatory to mounting. This, I fear, will be the history of many of these photographs, although some that are on sale are creditable examples of work so far as appearance. As already mentioned, the fine weather which prevailed during the greater part of the term of the carnival was in favour of good results; the review, being occasioned to about the worst light of the time, was not improved by the fall of a very heavy shower. Of course, the press photographers were working at high pressure, and, generally speaking, secured good points of view. One glaring error, however, was the placing of a 'press photographers'' stand on Prince's Bridge in such a position that the actual ceremony of the welcoming of the Duke and Duchess to the city by the Mayor and Corporation could not be photographed from it. I have not heard who was responsible for this bungle, but it considerably discounted the value of the photographs taken from this stand.

"It is said that photography owes much to the patronage which it has received from the Royal Family since its introduction, and it is certain that that branch of the house which has recently visited these shores has, at all events, indirectly been the means of making a considerable difference in the material trade. At Government House, the Royal party posed for some of our well-known photographers, who obtained good results. Orders had been given that no flashlight work was to be allowed in the Exhibition Building on the occasion of the opening of Parliament by His Royal Highness, and as it was considered essential by all except the officials who had charge of the ceremony that a photographic record of the ceremony should be obtained, plates were exposed, the sole illuminant being the light which came through the windows, and, considering the circumstances, the results were surprisingly good. Following the example of Sydney in January, enterprise has placed upon the market an illustrated booklet containing fairly executed half-tone reproductions of the arches and other notable subjects. These were offered at a reasonable price, and had a great sale. It is to be hoped that, now the 'lions' have departed, things will settle down to their normal condition, and that there will be something different to chronicle when the next 'Notes' come to be written."

ON THE USE OF THE ACTINOMETER.

[A paper read before the Photographic Society of Philadelphia, and reprinted from its "Journal."]

The use of an actinometer in printing is to be strongly recommended, not alone because of the accurate results given, but it makes the printing process very economical, besides saving much time. When accustomed to its use, printing by an actinometer is really less trouble than without it. Strips of P.O.P. are always left in the frame, and it simply requires that a piece be put in position and exposed in the same position as the negative, the printing being judged by consulting it, and not the print. Even in platinum printing, after the first exposure, the printing frame is never opened, except to supply fresh paper.

But it would appear that it is very seldom used. Possibly this is because if one is accustomed to printing without it, the habit of using it is not readily acquired, and then, besides, if one considers that obtaining one perfect print out of four sheets of platinotype paper is a fair showing, and really above par, why there's very little use of making one. I refer to platinotype paper because it is usually considered possible to print this to any desired point simply by the yellow image. If the print is frequently looked at, it is possible to come quite close to what is wanted, but it must be looked at as soon as the image begins to appear, and then requires careful watching until supposed to be finished. Unless this is done, it is quite possible to be far away from the desired result. In some negatives a very slight difference will ruin the artistic effect, and this is particularly the case in atmospheric effects. We devote much more time, nowadays, to the printing process, as a good negative is no more essential than absolutely correct printing.

To be personal, I would state that four or five years ago I made an

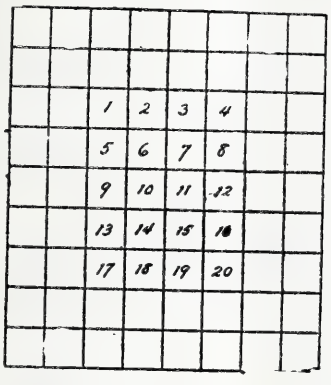
actinometer, and have used it constantly ever since for platinum, carbon, and gum printing, and have found the saving of paper alone, to say nothing of time, has fully repaid any trouble in making or using it. One great advantage in its use is the fact that, should the first print be over or under-exposed, it is then easy to print those following to the exact point, which is not the case with straight printing.

For the carbon process it is, of course, indispensable, and it is a great help in the gum-bichromate printing also.

The record of every negative is kept, and so arranged that if at any time a print is required the slip of P.O.P. can be instantly consulted and the print made with the assurance that it will be exactly right, and that it will not be necessary to make, say, three prints, and pick out the best one, a proceeding that I am afraid is sometimes resorted to.

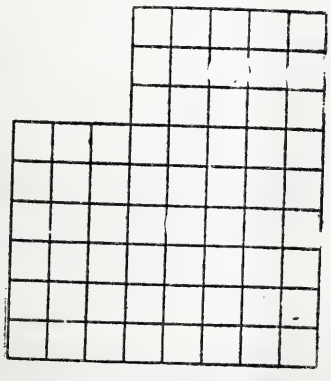
In making an actinometer, you wish it small, convenient and economical, and the records such as can be conveniently kept and referred to.

First, a piece of tracing paper or cloth is taken, say one foot square, and this is ruled off with a bow pen and Indian ink into quarter-inch squares. This ruling must be absolutely accurate. A piece 2 inches by 2¼ inches is now cut off, and, leaving a margin of ½ inch all round, the central portion is marked in ink with the figures 1 to 20, the marking being done on the side that will be away from the sensitive paper. The figures will be as per diagram herewith. This gives a



No. 1.

printing portion of 1 inch by 1¼ inches. From the next piece the portion corresponding to No. 1 is removed, the next having both 1 and 2 removed, and so on until completed.



No. 2, &c.

The first sheet, being the numbered one, is laid down with the numbers up, the other pieces being pasted thereon, one after another, until completed. The last sheet is then pasted by the edges to a lantern slide cover glass. Therefore, when the sensitive paper is used, it will print the figures correctly. A piece of opaque paper is then placed over the paper side, having an opening in it of 1 inch by 1¼ inches, and when this has been pasted over the tissue, all the light not needed will be cut off. A lantern slide printing frame is used to hold this actinometer, and it is ready for use.

For the sensitive paper, my experience has been that a paper called "aristo-platino" is most suitable to use, it being easily read, and keeps well. A 4 by 5 sheet gives 16 records by cutting the sheet in half, each half being 2½ inches by 4 inches, and then each half is cut into pieces 1 inch by 2½ inches. The eight pieces so made are printed at both ends, thus making sixteen exposures. As one package of a dozen sheets will give 192 exposures, it cannot be called an expensive process.

PRESCOTT ADAMSON.

ENGLISH AND METRIC WEIGHTS AND MEASURES.

THE metric system of weights and measures, which is the almost universal system upon the Continent, has not made very great headway in England at present. The advocates of metrical weights and measures blame English people very much for this, put loss of trade down to it, call us slow, behind the times, attribute it to our insular prejudice, with other choice compliments, quite forgetting that a change of this kind, affecting the whole English-speaking race, must necessarily be slow, if it is to be lasting; but, on the other hand, except for the sake of uniformity, it is doubtful if in all cases the metric system is such a great advance upon some English weights and measures; in connection with this, it must be remembered that each measure, or weight, has presumably been found most suitable to the particular trade in some way or other. Butchers' weights at first sight may seem rather absurd, with a stone of 14 lbs. for live animals and a stone of 8 lbs. for meat; but on thinking the matter over, it is probably not so ridiculous as it seems, for the difference of 6 lbs. in the two stones is possibly accounted for by the fact that in buying live animals there are the skins, hoofs, horns, hair, blood, and offal generally to be included in the stone. All these, of course, are missing when the animal is killed and the meat cut up into joints, the difference very likely amounting to 6 lbs. in 14 lbs., so that a butcher in buying a live animal knows that in purchasing a certain number of 14 lb. stones, he will have a like number of 8 lb. stones for sale in joints, and can thus readily calculate what his purchase will amount to. Where the fault in English weights and measures lies is when we come to dealing with other nations who use the metric system. Undoubtedly it is a mistake when sending catalogues to a country to send them in a foreign system of weights and measures; but is it not also a mistake to send them in a foreign tongue? Are English firms the only ones who make mistakes in this way? Not by a long way, for some foreign firms send their catalogues in their own language, with kilogrammes, litres, and metres for weights and measures, and the prices in francs, marks, pesetas, centimes, dollars, &c., but, of course, in many cases, unless a firm does a large foreign trade, it would be difficult to supply catalogues always in the native tongue of the customer. Still, one fault does not excuse another, and there is not the slightest reason in many cases why an English firm should not print the metric weights and measures side by side with the English weights and measures. The cost and trouble would be comparatively small, and it is frequently done by photographic journals in formulæ, &c. The cost would probably be more than covered by the increased trade, although we never hear of English firms refusing foreign goods because the catalogue is not in £ s. d., or lbs., qrs., cwts., if they want the goods. A sensible firm merely calculates the cost, and takes the goods, and presumably a foreign firm would do the same by English goods if they wanted the latter. What operates against English goods abroad is the duty placed on them by the importing country, as against the duty free importation of foreign goods here. Admittedly it would be better to have the catalogue in a familiar tongue, weight and measure, but, says the metric enthusiast, "How much better to have a system of weights and measures which everybody can understand." Certainly, and how much better to have a language which everybody can understand; but these are somewhat Utopian dreams at present; we have to face realities as they are in business, and the probabilities are that 99 per cent. of English-speaking people do not understand what is meant by metres, litres, or kilogrammes. One might as well speak or write in Greek or Hebrew; but, even presuming they did understand, the change from English weights and measures to those of the metric system must be gradual, for a sudden change would paralyse trade completely. Think for a moment of the alterations required—new school books, catalogues, weights, measures, technical books, rules, scales, machinery, &c. The various workmen, clerks, warehousemen, and shop assistants would have to get used to the change, and above all, and most important, the general public must be educated up to the new conditions. It is quite probable that as years go by the metric system will be largely adopted in England. Chemistry and photography will be, to a great extent, responsible for this, as apart from these sciences the metric system does not seem to be largely used here.

English manufacturers of photographic materials might find it to their interest to quite the sizes of their goods by the metric system as well as by the English, as probably the goods would be more largely used upon the Continent than they are at present if quoted in a familiar size. Plates and papers might be catalogued like this:—

$3\frac{1}{4}\times4\frac{1}{4}$ inches or 82.5×107.5 mm.
5 ×4 inches or 127 ×101.5 mm.
$6\frac{1}{2}\times4\frac{3}{4}$ inches or 165 ×146 mm.
$8\frac{1}{2}\times6\frac{1}{2}$ inches or 216 ×165 mm.
10×8 inches or 254 ×203 mm.
12×10 inches or 304 ×254 mm.,

and the other sizes in proportion. These metric sizes are not quite exact, but near enough for ordinary working. Toning baths and developers might be printed in milligrammes and cubic centimetres, as well as in grains and ounces, thus:—

Ammonium sulphocyanide, 15 grains or 1 gramme,
Gold chloride, 1 grain or 64.8 mgms.,
Distilled water, 8 fluid ozs. or 227.16 c. c.

As metric tables are not very universally taught or understood in England yet, probably many people would be quite lost in converting them to English tables, and vice versa.

The Metric Measure (Length).

1 millimetre (mm.).
10 mm. =1 centimetre (cm.).
100 mm. =10 cm. =1 decimetre (dm.)
1000 mm. =100 cm. =10 dm. =1 metre (m.).
10 m. =1 decametre.
100 m. =10 decametres=1 hectometre.
1000 m. =100 decametres=10 hectometres=1 kilometre (kilom.)

The metre is the standard, and is the length of 0° C. or 32° F. of a platinum bar kept at Paris, and known as the "Mètre des Archives." The metre was intended to be 0.000,000,1 of the quadrant of the globe passing through Paris. The standard metre is about 0.00015 shorter than it was intended to be. It is the equivalent of the English yard =39.371 inches.

English Measure (Length).

12 inches=1 ft.
3 ft. =1 yd.
1760 yards=1 mile.
1.152 miles=1 knot or geographical mile.

The English yard is the distance at 62° F. between two marks on a bronze bar, deposited with the Board of Trade.

Table of Conversion (Length).

1 inch=0.0254 m.	1 mm. =0.03937 inch.
1 foot=0.3048 m.	1 metre=39.371 inches.
1 yard=0.9144 m.	1 metre=3.2809 feet.
1 mile=1.6093 kilom.	1 metre=1.0936 yards.
1 knot=1.855 kilom.	1 kilom. =0.6214 mile.

Area or Surface (English).

144 square inches=1 square foot.
9 square feet=1 square yard.
4840 square yards=1 acre.
640 acres=1 square mile.

Area (Metric).

1 square millimetre (s. mm.).
100 s. mm. =1 square centimetre (s. cm.).
10,000 s. mm. =100 s. cm. =1 square decimetre (s. dm.).
1,000,000 s. m. =10,000 s. cm. =100 s. dm. =1 square metre (s. m.).
10,000 s. m. =100 ares=1 hectare.
1,000,000 s. m. =10,000 ares=100 hectares=1 square kilometre.

Area Conversion.

1 sq. inch=6.451 s. cm.	1 s. cm. =0.155 sq. inch.
1 sq. foot=929 s. cm.	1 s. m. =10.764 sq. feet.
1 sq. yard=0.8361 s. m.	1 s. m. =1.196 sq. yards.
1 acre=40.46.7 s. m.	1 hectare=2.471 acres.
1 sq. mile=2.59 sq. kilom.	1 sq. kilom. =0.3861 sq. mile.

Weight or Mass (English Avoirdupois).

437.5 grains=1 oz.
7000 grns. =16 ozs. =1 lb.
112 lbs. =1 cwt.
2240=20 cwt. =1 ton.

Troy or Apothecaries' Weight.

480 grns. =1 oz.
5760 grns. =12 ozs. =1 lb. =0.823 lb. avoirdupois.

Avoirdupois is the English standard weight. A pound is the mass of a piece of platinum kept by the Board of Trade.

Mass (Metric).

The kilogramme is the standard, and is the mass of a piece of platinum kept in Paris known as the "Kilogramme des Archives."

1 milligramme (mgm.).
10 mgm. =1 centrigramme (cgm.).
100 mgm. =10 cgm. =1 decigramme (dgm.).
1000 mgm. =100 cgm. =10 dgm. =1 gramme (gm.).
1000 gm. =1 kilogramme (kilog.).
1,000,000 gm. =1000 kilog=1 tonne.

The gramme is very nearly the mass of 1 cubic centimetre of water, at 4° C., or 39° F. Therefore a litre of water weighs about 1 kilogramme.

Mass (Conversion).

1 grain=64.8 mgm.
1 oz. =28.35 gm.
1 oz. troy=31.1 gm.
1 lb. =453.593 gm.
1 cwt. =50.8 kilog.
1 ton=1016.05 kilog. =1.01605 tonne.
1 gramme=15.432 grains.
1 kilog. =2.2046 lbs.
1 tonne=0.9842 ton.

Volume or Capacity (English).

34.659 cubic inches=20 fluid ozs. =1 pint.
277.274 cubic ins. =160 fluid ozs. =1 gallon=0.16046 cubic foot.
1728 cubic ins. =49.857 pts. =6.2321 gals. =1 cubic foot.
27 cubic feet=1 cubic yard.

A gallon is the space occupied by 10 lbs. of water at 62° F. A cubic foot of water at 39° F. weighs about 62.4 lbs., or 1 lb. of water occupies about 0.01604 of a cubic foot.

Volume (Metric).

The litre is the standard, and is the volume occupied by a kilogramme of water at 4° C., or 39° F., its point of greatest density. A litre is very nearly a ubic decimetre.

1 cubic centimetre (c. c.).
1000 c. c. =1 litre (cubic decimetre (l.).
1,000,000 c. c. =1000 l. =1 stere (cubic metre).

Volume (Conversion).

1 cubic inch=16.386 c. c.	1 c. c. 0.06103 cub. in.
1 pint=567.9 c. c.	1 l. =61.027 cub. in.
1 gal. =4.54346 l.	1 l. =0.2201 gal.
1 cub. ft. =28.315 l.	1 l. =0.03532 cub. ft.
1 cubic yd. =0.7645 cub. m.	1 stere=1.308 cub. yd.

1 litre=35.216 fluid ozs.

Platinum, which is one of the most expensive metals, is used for the standard weights and measures (more especially weights), because it is unaffected by the atmosphere, and by practically nothing else except friction. Thus, no matter how long the standards may be kept, no change is likely to occur.

One great advantage of the metric system is that it is worked upon the decimal system, all the multiples and divisors being in tens, or multiples of ten. Thus multiplication and division is fairly simple; but, on the other hand, decimals are not a strong point even with some business men, the vulgar fractions, ½, ¼, 1-16, &c., being much better understood. When we come to put some of our lower fractions into decimals they certainly look somewhat ponderous and awe-inspiring. Thousands of people understand the fraction 1-32, but give it to them 0.03125, and a very large percentage of them would be at sea.

C. T. Sutton.

Our Editorial Table.

Chlorsilber-Schnelldruck Papier. By L. Hermann Liesegang. Ed. Liesegangs Verlag, Dusseldorf.

The firm of Ed. Liesegang, which for so many years has been associated with the manufacture of photographic materials, has recently introduced a printing paper of the chloride type for development, bearing the name of "Pan-Papier." This monograph of the paper gives a comprehensive account of its properties and the treatment which should be adopted for obtaining the numerous effects of colour within its scope. We not only recommend the book to users of Messrs. Liesegang's paper, but also to those who print with other kinds of chloride development papers, as they will doubtless find in it many valuable hints.

Anleitung zur Projection. By Hans Schmidt.

Verlag von Gustav Schmidt, Berlin.

This small volume upon the optical lantern forms part of the well-known series published under the title of the "Photographische Bibliothek," and is intended as a guide for the amateur. The necessary instructions for the use of the paraffin lamp, the various kinds of gas-burners, and the electric light are given, and the information concerning illuminants has been brought well up-to-date. The author is a well-known optician, and gives a very clear account in popular language of the optical principles involved in the construction of the lantern. The text is well illustrated throughout.

Hypax.

J. J. Griffin and Sons, Ltd., 20-26, Sardinia-street, London, W.C.

The search for a perfect hypo eliminator has been a long one, and now Messrs. Griffin claim that in Hypax they have discovered a genuine and complete hypo destroyer, which, if used as directed, will, by oxidation, transform hyposulphite of soda into a mild and harmless product which may be easily dissolved away by a few minutes' washing, so that the permanganate or iodide of starch test will not reveal the slightest trace of it, a claim which we find to be substantiated in practice. The directions for using this preparation are as follows:—After the plates, films, or papers are properly fixed, rinse them well for about one minute. Then place them in a dish containing sufficient water to cover them, and then add, not before, one pill of Hypax. Rock the dish until the Hypax is completely dissolved (which will take but a minute or two), then rinse the plates or prints again for two minutes in running water, and allow to dry. Hypax is most active during the process of dissolution, therefore the solution cannot be prepared in advance. One pill will destroy the hypo from six quarter-plates, or three half-plates, or five prints half-plate. Where a small quarter-plate dish is used, break the pill in four parts, and use a quarter for each plate, otherwise do the six plates together in a large dish with one pill.

Catalogues Received.

Lumière N.A. Co., Ltd., 78, Queen Victoria-street, E.C.

From the above company there have come to hand price lists of the Lumière dry plates, ordinary, panchromatic and orthochromatic, with particulars as to the special class of work for which they are designed. A price list of the citrate P.O.P. and bromide papers, with methods of working, has also been received.

The Prestwich Manufacturing Co., 1, Lansdowne-road and 744, High-road, Tottenham, N.

An exceedingly well-printed catalogue of the Prestwich specialities for kinematography and ordinary lantern work, illustrated by half-tones of the works and wood blocks of their leading lines.

Artisti Platinum.

Geo. Houghton & Sons, 88 and 89, High Holborn, W.C.

This is a new platinum paper, manufactured by the Scovill and Adams Co., of New York, for which Messrs. Houghton have been appointed sole agents for this country. The paper is packed in tin tubes, containing 12 pieces of paper, and it is manufactured in two grades, smooth and rough. The directions for working it are as follows:—Printing.—Handle the paper in artificial or weak daylight. With a normal negative, print until a trace of the detail desired is barely visible in the high lights. Development.—Immerse the print in the developer with a quick-sweeping motion, to remove any air-bells that may form on the surface. Twenty to forty seconds will be about the time required to complete development of the average print. While the developer may be used repeatedly, it must be kept up to normal strength by adding fresh developer to the old. It should be filtered when it becomes stained or dirty. The best results are obtained with the temperature of the developer from 60° to 80° F. If prints are under-printed, the developer may be heated up to about 110° F., and good results obtained. Always rock the tray or stir the developer to break up any scum floating on the surface that may cause stains or irregular markings on prints. Formula for developer.—Water, 50 ozs.; neutral oxalate of potash, 6 ozs.; potassium phosphate (monobasic), 2 ozs.; sodium phosphate, 1 oz. Care must be used to obtain the monobasic potassium phosphate, the ordinary article sold under this name is usually the tribasic. Clearing.—Immediately after prints are developed, place them, face down, in the acid bath, composed of muriatic acid, c. p., 1 oz.; water, 60 ozs. Never place the prints in water from the developing bath, but transfer directly to the acid bath from the developer. After remaining in this acid bath for about five minutes, transfer to a second acid bath of same strength. They should pass through at least three acid baths to remove all chemicals, and to insure permanent prints. After clearing, wash from 20 to 30 minutes, in running water. If running water is not available, six to eight changes of water in the tray will be necessary. It will be seen from the above that the paper is what is known as the cold-bath type, and in our hands it has given some excellent results. Messrs. Houghton issue a little booklet, with a specimen print, a copy of which they will be pleased to send on to any applicant. Messrs. Houghton have also taken up the agency for the various general goods manufactured by Messrs. Scovill and Adams.

The Photographers' Peerless Note-book.

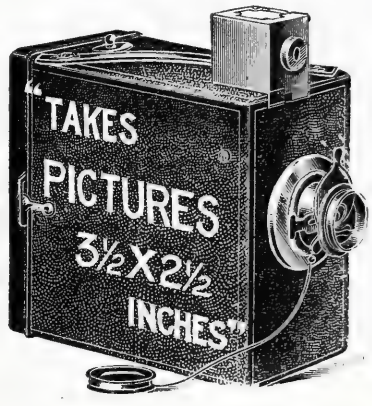
Geo. Houghton & Sons, 88 and 89, High Holborn, W.C.

Everyone ought, so the text-books say, to make a record of every exposure that he makes, and this little book will be found extremely convenient for that purpose, being handy in size for the pocket, and containing a lot of useful information.

The Little Nipper Camera, No. 2.

W. F. Butcher & Son, Blackheath.

Emboldened by the phenomenal success of the original Little Nipper camera, Messrs. Butcher have now introduced the No. 2, which takes a picture 3½×2½ inches. It is constructed of metal, and is covered with morocco-grained leatherette, and takes six plates or 12 films.



It has a single view lens, with two adjustable diaphragms, a time and instantaneous shutter, and lens cap, with a ground glass view finder, which is adjustable both for horizontal and vertical pictures, and a leather handle for carrying. The camera is well made, and capable of turning out good results, and a very attractive showcard printed in colours has been issued for the use of the trade.

News and Notes.

The Whitta Photo Works, of 43, Whitta-road, Manor Park, London, E., have sent us their trade price list of bromide and carbon enlargements, and for printing in silver, P.O.P., and platinotype.

The prize camera for the current month in the Austin-Edwards monthly film negative competition has been awarded to Mr. H. Kew, 49, Atlantic-avenue, Belfast, for his negative "Finish Bicycle Race at Ballymena."

The Multiscope and Film Co., of Burlington, Wisconsin, U.S.A., send us a neat little pamphlet entitled "The Re-enthusing of Tom Rainesborough," which was effected by his seeing one of their Al-Vista Panoram cameras.

Charles Letts & Co., 3, Royal Exchange, E.C., have just issued a new exposure note-book, which contains the usual blank spaces for records, a list of dealers throughout the country, and information where to obtain permits, &c., for photographing, and a self-opening memorandum tablet, and also a £500 insurance against the general risks of travel.

We are requested to announce with regard to the conditions of Messrs. Tyler and England Bros.' "Teb" Christmas card competition, that the following interpretation must be put on the fifth paragraph of the rules: "Messrs. Chas. Tyler and England Bros., Ltd., cannot undertake to return any prints sent in, but reserve the right to reproduce only the winning prints."

The Great Eastern Railway have done much in the way of exploiting the seaside resorts served by their lines by the liberal use of illustrated booklets, and the latest of these is an annotated time table for the Cromer and Mundesley expresses, which gives the time that the trains should pass a given station, and a brief note, in many cases illustrated, of the principal features of the town or village.

On August 14 the members of the North Middlesex Photographic Society attended an informal meeting at their new rooms at Hanley Hall, Sparsholt-road, Stroud Green, after having occupied Jubilee Hall for over 10 years. The new premises afford more accommodation and advantages than the old, and are only a few minutes' walk therefrom. The meeting night has unavoidably been changed from Monday to Wednesday.

We regret that in our last issue in the advertisement of Mr. A. E. Mallandain's excellent "V.B." self-toning paper, an error was made in stating that 42 quarter-plate sheets would be sent for 6d., instead of 24. Our readers will kindly note this, and make the necessary correction.

The "Free Lance," the weekly society paper edited by Clement Scott, is offering its readers each week a two-guinea portrait for 6s. 6d., which is described as "a life-like and magnificent enlarged portrait, mounted on a superb plate, with sunk mount, 24×19 inches. These beautiful portraits, called 'Aerindas' are copied from any photograph (no matter how faded they may be), cabinet, carte-de-visite, or any other size or pattern. They are superbly finished in indelible crayon and India ink, by air-brush process, which never fades—Ideal Works of Art!"

The popularity of the lantern lecture as a means of amusement and instruction was never greater than at the present time, and, following the precedent of previous years, Messrs. Eyre and Spottiswoode, of Great New-street, E.C., have again this year provided a series of entertaining and instructive lantern lectures for the winter evenings, and they have arranged with Mr. C. B. Fry, the famous cricketer, to write on "The Sports of Old England," Mr. C. R. Ashbee on "The Beauty Spots of Great Britain, and how to preserve them," and Mr. Arthur Croxton on "Popular Humourists of the Day." Conditions and terms will be sent to any of our readers in return for a stamped addressed envelope.

The following is the list of awards of the Warwick competition for the current month:—£10 prize, John Westworth, Dentonville, St. Helens; £5, N. C. Hewitt, Glenholme, Cowes, I.W.; £1, A. J. Antoine, 10, Halsbury-road, Liverpool; £1, Miss M. D. Bird, Thruxton Rectory, Tram Inn; £1, J. Campbell, New-street, Kennington, London; £1, S. L. Coulthurst, The Cottage, Tootal-road, Wraste; £1, Miss M. C. Eames, Bache Isa, Llangollen; £1, A. H. Hall, Duncrag, Bonhill-road, Dumbarton; £1, H. M. Hames, 65, West-street, Boston; £1, G. R. Henderson, Glendale House, Argyle-street, Hebburn-on-Tyne; £1, H. Holden, 5, Priory-road, Edgbaston, Birmingham; £1, A. J. Keith, Courtlands, Castlebar, Ealing; £1, F. Macfadyen, The Gables, Monkseaton; £1, J. E. Masters, 9, Gwyn-street, St. Paul's, Bristol; £1, C. F. Medhurst, 29, Park-place, Cardiff; £1, Miss E. Murton, Kirkby-Lonsdale; £1, H. Rew, 49, Atlantic-avenue, Belfast; £1, J. Ritchie, jun., 69, Duff-street, Macduff, N.B.; £1, T. A. Scotton, Briar Lee, London-road, Alvaston; £1, P. Sharp, Brant Broughton, Newark-on-Trent; £1, Miss Winnifred Grace Vidler (age 11), The Gables, Pevensey; £1, Thomas Wright, 77, Loughborough-road, West Bridgford.

Commercial & Legal Intelligence.

At the Greenwich Police Court on Thursday last, Henry Archibald Spencer, a photographer, was charged, on remand, with obtaining money by means of false pretences. Detective-inspector Kyd said that there were 140 complaints against the prisoner of having obtained money by taking photographs and failing to execute the orders. The Magistrate said he thought it was a case for the Public Prosecutor, and again remanded prisoner.

Haigh, Ltd.—The above-named company has been registered with a capital of £3500 in £1 shares, of which £2600 are preference shares. The objects of the company are to adopt agreements with J. Haigh and C. R. Haigh for the acquisition of the business of opticians, photographers, photographic dealers, cutlers, dealers in fancy goods, &c., carried on at 77, Lord-street, Liverpool, by J. Haigh, and at 241, Grange-road, Birkenhead, by C. R. Haigh, and to develop and extend the said business. There will be no initial public issue. The qualification of the directors is fixed at £5, and there are not to be less than two nor more than seven directors.

Re William Charles Bax, Photographer, of 26, North-street, Rugby, and Church-street, Lutterworth.—The Official Receiver has now issued particulars under this failure, from which it appears that the debtor has filed a statement of affairs showing gross liabilities amounting to £242 14s. 5d., of which £219 19s. 5d. is expected to rank against the estate for dividend. The assets are estimated to produce £86 16s. 9d., from which £22 15s. has to be deducted for the claims of preferential creditors payable in full, leaving net assets at £64 1s. 9d., and disclosing a deficiency of £155 17s. 8d. Debtor alleges his failure to have been caused through his expenses exceeding his income, and failing to get the same returns from the business at Lutterworth that he received when he managed the business himself, also to want of capital.

Marion and Co., Ltd.—This company has been registered with a capital of £100,000 in £1 shares. The objects of the company are to acquire the business carried on as Marion and Co., and to adopt an agreement between A. L. Marion, H. L. Guibout, G. Bishop, and F. Bishop, trading as Marion and Co., of the one part, and A. S. Hicks, for the company, on the other part, and to carry on the business of manufacturers and importers of French stationery and fancy goods, dealers in photographic dry plates, papers, and materials, photographic publishers, dealers in works of art, &c. The first seven subscribers are A. L. Marion, 22, Soho-square, W.C., manufacturer; H. L. Guibout, 22, Soho-square, W.C., manufacturer; L. Michlet, Paris, manufacturer; G. Bishop, 22, Soho-square, manufacturer; F. Bishop, 22, Soho-square, manufacturer; G. M. Bishop, 22, Soho-square, manufacturer; G. F. Bishop, 22, Soho-square, W.C., manufacturer. There will be no initial public issue. The first directors are Frank Bishop, managing director, and Gerald M. Bishop and George F. Bishop, assistant managing directors. Qualification £1000.

At the Scarborough County Court last week, before his Honour Judge Raikes, Mrs. Elizabeth Dawes Sarony, photographer, of Scarborough, sued Mr. John J. Savile, of Tapton Cliffe, Sheffield, to recover the sum of £58 16s., money alleged to be due for painting a portrait. It appeared from the plaintiff's evidence that on August 20, 1898, Mrs. Savile, accompanied by her husband, went to Mrs. Sarony's studio and gave an order for the painting of two portraits, one of herself and the other of the defendant, at 50 guineas each, and frames at six guineas each. When the portraits were completed Mrs. Savile was dissatisfied, and Mr. Savile wrote saying that intimate friends could not recognise the portrait. Eventually defendant paid for his portrait, but his wife's was sent back, despite plaintiff's offer to do all she could to give satisfaction. Litigation ensued, and the case was sent down from the High Court. The portrait was painted by Mr. Conley Vivian, of Warwick-gardens, Kensington, London, who was engaged at Mrs. Sarony's studio during the summer months. Mr. Vivian, on being called, stated that he had painted portraits of the King when he was Prince of Wales, Earl Manvers, the Duke of Portland, Prince Imperial, and other noted personages, and had always given satisfaction. Whilst the work was in progress the sitters expressed their satisfaction with the portraits. For the defence it was alleged that the portrait was not like Mrs. Savile. His Honour, after examining the portrait, formed a contrary opinion, and found for the plaintiff for the amount claimed. Mr. Wragge, on behalf of the plaintiff, said that although they had obtained judgment, they would still be pleased to alter the portrait, in order that Mrs. Savile might be satisfied with it.

Re Robert T. Ford, lately carrying on business as a Photographer in King-street, Egremont.—An application was made at the Birkenhead Bankruptcy Court, before his Honour Judge Bowen Rowlands, for the discharge of the above-named bankrupt, on Thursday last. The Deputy Official Receiver stated that the statement of affairs filed by the debtor disclosed liabilities amounting to £710, and the assets have realised £5 5s. up to the present, but it was expected that another £10 would be realised. That amount would not cover the costs of the bankruptcy proceedings by about £20. He alleged that the debtor had not kept such books of account as would disclose his business transactions and financial position for the three years preceding the date of his bankruptcy. The receiving order was made in November of last year, and debtor was adjudicated bankrupt in April last. The debtor had previously been in various situations as manager to different firms of photographers, and commenced business for himself at Egremont in December, 1896. At the end of 1898 he gave a bill of sale for £200 on his furniture and effects to Mr. Edwards, and he used the money in payment of his debts. Afterwards Mr. Edwards put his son as apprentice to the debtor, but he was subsequently dismissed through going late to work owing to his being detained at a religious service. His Honour said it was not often in this age that people were found devoting more attention to spiritual than to material affairs. It was further stated that soon after the lad's dismissal Mr. Edwards seized the debtor's stock and effects, and found that a number of articles that had been scheduled were not the debtor's property at all, but had been obtained on the hire system. Mr. Madden, who appeared on behalf of the debtor, said that error arose in making out the schedule, for which the debtor was not responsible. He further contended that the debtor's present position had been caused through the seizure of his stock and effects six months after the bill of sale was given, which caused the ruin of debtor's business. If the quarrel had not occurred the bankrupt would have gone on doing a large business, and he would now have been a successful man. Debtor, on being put into the box, said he kept such books of account that enabled him to ascertain his financial position from time to time. His wife was now carrying on business as a photographer, and he acted as her manager at a salary of 10s. per week. His wife kept him, and he was unable to make any offer to his creditors. His Honour said it had been clearly proved by the Official Receiver that the debtor had not kept proper books of account. He would grant an immediate discharge, however, if the debtor would pay the creditors 10s. in the pound, otherwise the discharge would be suspended for the statutory period of two years. Mr. Madden, on behalf of the debtor, said he would accept the latter alternative, as his client was unable to pay his creditors the suggested dividend.

Meetings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Meeting, August 15,—Mr. J. E. Hodd in the chair.

Mr. Everitt passed round an exceedingly fine portrait transparency of Mr. Steinheil, of lens fame.

In regard to the conversation on celluloid varnish at the last meeting, the Chairman said he had tried varnishing a rollable film negative, as suggested by Mr. Brown, but the varnish had gone over the edge of the negative in one place and dissolved the celluloid base, where it came in contact, leaving only the emulsion. He had finally succeeded, however, by pouring one or two small pools of varnish on the negative, and then carefully working over with a brush.

Mr. Hodd thought there was a good opening for a reliable celluloid film varnish, as the quantity of rollable film now used was enormous.

Mr. Henderson suggested the use of benzole and gum dammar, the film to be varnished being placed round a bottle or cylinder of some kind, and secured at the edges by fine rubber bands, the varnish to be then applied by a brush; this would dry in a very short time, and the nega-

tive come away quite flat; also, benzole was not a solvent of celluloid like amyl-acetate.

Mr. Drage, in speaking of the unpleasant odour arising from amyl acetate, asked what objection there was to using acetone instead.

The Chairman remarked that there evidently was an objection, as the majority, if not all, of the manufacturers of celluloid varnish employed amyl-acetate, and thought that possibly the price of acetone would be against it.

Mr. Haddon said it would also be very necessary to get the acetone perfectly anhydrous, or else the varnish would dry matt.

Mr. T. K. Grant suggested another use for celluloid varnish in the case of a film being torn. First coat a piece of clean glass with thick celluloid varnish, then place the torn film on top in position, and then run over another coating of varnish, and when dry carefully cut round the negative through the two layers of varnish, and strip from the glass. The film would then be protected and strengthened by the two coatings of varnish.

Mr. Brown showed a print which he had enamelled with this celluloid varnish instead of collodion, the procedure being precisely the same as with the collodion. He also frequently dips prints in the varnish to protect them from atmospheric influences, but this did not glaze them.

Mr. Henderson said it was a good thing to rub a little wax over the varnish, as varnish very often left minute holes caused by specks of dust, &c., which the wax would fill up. Care must be taken not to rub on too much, or else the plate would become very slippery, and the paper might slip when the frame was opened for examination.

A discussion then followed as to whether a negative was less dense when dry than when wet, the Chairman remarking that a negative had partially dried with the exception of one or two places in the sky, where it showed very uneven density. He had then thoroughly soaked the negative again in water, and it finally dried quite evenly.

Mr. Brown said the action was purely physical, and due to the fact that when part of the gelatine was wet it naturally swelled, causing greater separation in the molecules of silver, thus letting more light through, and causing these parts to appear more transparent than the dry.

Mr. Drage raised the point as to whether we are to be entirely dependent on Germany for our developers. As far as he could see the only developer we could call our own was the ferrous-oxalate, all the various "ols" which are now being used, and even pyro, being constituents of German products. The matter was brought to Mr. Drage's notice by a German technical report, in which, among other things, it was noted about the enormous quantities of phenol they had had to import, and were now congratulating themselves on the fact that they were now able to turn out a small quantity over there. As it was, we supply them with the raw thing, and they make it up and re-sell it to us in the form of these patent developers.

Mr. Drage suggested that we were lacking in our chemical training, or such things would not be. Conversation then ran on other articles we had to depend on other countries for, and also on the use or "no use" of the Trades Marks Act, the general opinion being that it is a perfect delusion, numerous instances of its abuse being quoted; in fact, the Trades Marks Act might very well be considered a dead letter.

Patent News.

THE following applications for Patents were made between August 6 and August 10, 1901:—

PRISM TELESCOPES.—No. 15,774. "An Improved Method of Fixing the Prisms of Prism Telescopes and the like." JOHN HENRY BARTON.

ACETYLENE.—No. 15,846. "Improvements in Apparatus for the Manufacture of Acetylene and other Gases." Complete specification. JOHN JOSEPH HENDLER.

CAMERAS.—No. 15,897. "Improvements in or relating to Photographic Cameras." LUTHER WASHINGTON MENCE.

PLATES.—No. 15,921. "Improvements in Photographic Plates for producing Ink Impressions." Complete specification. ALEXANDRE HENRIOT *née* LOUISE CLARON.

PHOTOGRAPHIC APPARATUS SUPPORTS.—No. 15,969. "Improvements in Adjustable Supports for Photographic and similar Apparatus." (Communicated by the firm of Thill & Küll, Germany.) WILLIAM PHILLIPS THOMPSON.

BURNISHERS.—No. 15,986. "Improvements in and connected with Photograph Burnishers." CLATONIA JOAQUIN DORTICUS.

AUTOMATIC WASHERS.—No. 16,005. "Improvements in Automatic Apparatus for washing Photographic Prints and Plates." ANDREW GEORGE ADAMSON.

FOCUSSING DEVICE.—No. 16,023. "Device for Focussing the Sensitive Surfaces of Film Bands." Complete specification. WILLY BEUTLER.

FLASH LAMPS.—No. 16,030. "Improvements in Flash Lamps for Photographic or other purposes." GEORGE COLLARD.

STEREOSCOPIC PICTURES.—No. 16,092. "A Method of and Means for Preparing, Exhibiting, and Viewing Stereoscopic Pictures." Complete specification. FRANK WORDSWORTH DONISTHORPE.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE LATENT IMAGE.

To the EDITORS.

GENTLEMEN,—After seeing your contributor's remarks about the latent image, I should like to draw attention to two points regarding the sub-bromide theory, which, though suggested by the action of light on gelatino-chloride paper, may be considered analagous for obvious reasons to the actions met with in a bromide film. When a chloride print is faintly printed, for subsequent development, the preliminary treatment to potassium bromide sometimes imparts a colour similar to silver sub-bromide to the film; in this case it would seem that a thin layer of silver sub-bromide is formed over the reduced chloride. Also if gelatino-chloride paper be washed before exposure, the deprivation of its free nitrate renders printing much slower, hence it may be assumed that silver is taken from the nitrate to assist in the formation of sub-chloride.—I am, yours, &c.,

August 17, 1901. T. THORNE BAKER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

T. McKey & Son, 62, Hill-street, Newry. *Photograph of delegates at Irish National Foresters' Convention.*

John Gill Muse, Allanbank Studio, Larbert, N.B. *Photograph of Major Dobbie, J.P., Beechmont, Larbert, N.B.*

John James Griffiths, 30, Alma-road, Sheerness. *Two photographs of Warden Point, near Leysdown, Isle of Sheppey. Photograph of Warden Cliff, Leysdown, Isle of Sheppey. Photograph of The Beach, Leysdown, Isle of Sheppey.*

G. E. WALES.—We have written to our correspondent.

R. R. PARKER.—We can give no further information than is contained in the two letters you send. Ebonite sheets, any size, can be obtained from the Silvertown Co., Leadenhall-street, E.C.

CARBONATE OF SODA.—T. G. S. says: "Will you kindly inform me through your paper if common washing soda is the same as carbonate of soda in crystals?"—In reply: Yes, but the carbonate of soda sold for photographic purposes is usually a purer article than that sold as washing soda.

A. H. DOWNEY writes: "Will you kindly give me the formula for the ammonium persulphate reducer for negatives, and the strength of the sodium sulphite solution to stop the action?"—In reply: The usual strength is 1 per cent., that is about 5 grains to the ounce of water for the reducer, and a 5 per cent. solution for the sulphite.

PRINTING-OUT PAPER.—W. H. asks: "I shall be greatly obliged to you if will kindly let me know which is the best paper for printing in the simplest way for toning, and the cheapest way to get the best result by using a certain paper? What paper would that be?" In reply: You cannot do better than use one or other of the P.O.P.'s advertised in our columns. It is quite against our rule to recommend the goods of any particular maker.

PHOTOPHIL writes: "Is there any liquid which is non-absorbent of carbonic acid gas—and at the same time is cheap and non-explosive—this query has reference to an invention connected with photography?"—In reply: We regret that the query is so vague that it is almost impossible to answer it. Is the purpose merely to prevent the absorption of carbonic acid from the air, or is the gas to be forced through the liquid? Until we have further data it is impossible for us to answer.

ENAMELLING PRINTS.—"MARLOW" asks: "Can you give me any information as to the easiest way of producing enamelled prints on P.O.P., also best mountant?"—In reply: The method has so often been described in detail in back volumes of the JOURNAL and ALMANACS that we cannot spare space in this column to repeat what most of our readers are quite familiar with. If, however, our correspondent will refer to the answer given to "Mere" on page 444 of the JOURNAL for July 12, he will find what he requires. Although our correspondent is an 'Old reader of the JOURNAL' we fear he is not a very diligent one.

VARIOUS QUERIES.—J. W. P. says: "(1) I photographed a lady a few months ago. The lady has since died. The photographs have not been paid for, neither an enlargement supplied. Can the relatives get it reproduced by another photographer or themselves? Have I any claim upon it (the photograph)? The said lady was also a relative of mine, still I don't wish to be done. (2) Can I register the above now if I desire? Is it necessary? (3) Do you recommend toning P.O.P. without previous washing that supplied by manufacturers for so doing? (4) Is one hour sufficient washing for P.O.P. if changed or bowl emptied nine to ten times?"—In reply: (1) Yes, they can, as you have not registered it. (2) You can register, but that will not cover the pictures issued before registration. (3) We prefer to wash the pictures before toning, and always do so ourselves. (4) Yes, if the prints are kept in motion the while.

FORMULA WANTED.—M. N. M. writes: "(1) Will you kindly give me a formula and the necessary instructions for sensitising papers so as to have negative prints from a negative and positive prints from a positive upon the sensitised paper? (2) Do you think it will be of any use for me to be a member of the P.P.A., as I am a foreigner, and in a foreign country? (3) Also, does the Association receive members from abroad? (4) Can I obtain a certificate concerning my knowledge upon the science and art of photography? If so, where shall I write for it, and by what conditions is it possible?"—In reply: (1) We do not know of any modern method. There is a modified method of Talbot, and one or two given in Hunt's work, but they are of little practical value. (2) We see no special advantage in your case. (3) Yes. (4) The Guilds and City of London Institute will grant a certificate, but only on your passing a personal examination.

TONES—RESIDUES.—"EXPERIMENTALIST" says: "(1) I have been experimenting trying to obtain tones resembling that of carbon on Eastman royal rapid bromide paper. I respectfully submit a red tone and should feel pleased to have your opinion of same. I have no doubt but that I can produce the various other colours by further experimenting. (2) What action has potassium carbonate combined with carbonate of soda in pyro-soda developer? I find by just using carbonate of soda alone with pyro that I can obtain excellent results, and cannot see the use of potassium carbonate. Only more expense. (3) Could you name a price as near as possible for 8 lb. of liquid residue nitrate of silver from fixing bath?"—In reply: (1) The colour is good, but the print lacks the vigour of one in carbon. (2) There is no actual advantage in using the two salts, if you can get the same result with one, and we have no doubt you can. (3) We can give no idea whatever, as we have no means of knowing how much silver there may be in the 8 lb. of liquid residue.

OPERATOR writes: "I had occasion to go and photograph a large house and shop in a public market-place a day or two back, and had instructions to be sure and not have any people or obstructions of any kind in front, as the building is about to be pulled down. But when I was about to make the exposure a man came and stood quite in front of the house, and when I asked him politely if he would oblige me by standing on one side, he point blank refused to do so, saying, 'This is a public path.' Now, could I call a policeman and have him moved, or what is the best plan to adopt with such ignorant people?"—In reply: It certainly would be ultra vires for a policeman to move the man on, because he was not causing any obstruction, and if persuasion or the suaviter in modo was of no use, it would be hopeless to resort to force or the fortiter in re. We should have pretended to take the building, and politely informed the man that we should be pleased to let him have a print, and then waited till he had moved on, and made the real exposure. We know of a case which recently occurred in London in which a negative was required of a building for a law case, and, the occupants objecting, stood in front of the lens, but the operator lit his pipe and gravely informed them that it made no difference to him, he was prepared to wait for twenty-four hours, but he meant to take it, and did in less than an hour.

A. PALMER sends us the following clipping from one of the tit-bit papers, and asks whether it is perfectly accurate:—"What is the highest price ever paid for a single photograph? The most costly photographs in the world are those taken by the immense camera belonging to the Chicago and Alton Railroad Company, and the photograph globe-map of the 30,000,000 stars in the heavens. The railroad company's photograph measures 8 ft. in length by 4½ ft. in width. Each plate weighs 100 lb., costs £5, and takes five gallons of developing fluid, while it requires six men to assist in moving it. The camera weighs 900 lb., and the plate-holder when loaded weighs 500 lb., making the total weight nearly three-quarters of a ton. To take a photograph needs the services of fifteen men. The costly photograph taken by it was exhibited at last year's Paris Exhibition. The photograph star-globe will be a complete star-map of the heavens, and have a diameter of 24 ft." In reply: We can only say that the information given is only an indirect answer to the question; the statements as to the mammoth camera are, if we are to believe some of our American exchanges, correct. The "star-globe," is however, we believe, a muddle up of the international star chart, which is being simultaneously prepared by almost every observatory in the world, and, so far as we are aware, there is no question of making a star-globe, but of publishing an atlas.

HARDENING FILM.—"ENLARGER" asks: "(1) Can you tell me if a bromide enlargement can be hardened sufficiently, or treated in any way, so that it will stand boiling water, so that figures may be transferred (by the Eastman's transferrotype method) on to a space reserved for them? (2) Also, where pegamoid, perchoid, or other substance suitable for lining the inside of wooden dishes can be procured?"—In reply: Formaline will render gelatine very hard and insoluble, but whether it will do so sufficiently to withstand the action of boiling water we cannot say. But is it necessary to use water so hot as boiling for the purpose? (2) For the moment we do not remember the address of the makers. But we have little doubt that your dealer will procure it for you.

A STUDIO QUESTION.—"HARD LINES" says: "(1) I want a little information on two points which I think you can give me. My studio has been built now for two years, one of the so-called portable wooden structures by ———. I did not send plans to local authorities, not thinking it needful. Can the local authorities interfere with me now, seeing it has been built two years? (2) Can my next-door neighbour block out my light by building a high fence? The studio is about four feet from a low fence dividing the two gardens."—In reply: (1) Yes, if the building does not comply with the local bye-laws as regards buildings. (2) Your neighbour has a perfect right to erect anything he likes on his own premises, so long as he does not obstruct "ancient lights." As your studio has only been put up a couple of years, you have no claim to them.

TONING—COPYRIGHT.—"TONER" says: "I shall be glad if you will kindly give me toning formulæ for (1) a light reddish-brown tone, and (2) a dark brownish-purple tone? Both for gelatino-chloride P.O.P. (3) I shall also be glad if you will give me your opinion on the following matter. I am thinking of making a series of lantern slides of scenes from the Boer War. I shall have to take same from various books which have been published during the war. The pictures which I propose to make the slides from are mostly photos (but are not marked 'copyright'), and the opinion I want from you is as to whether I am under any penalty to the photographers should I take and exhibit the said views?"—In reply: (1 and 2) Use the formula supplied with the brand of paper you use, stopping the toning operation at an early stage for the reddish-brown tones, and carrying it deeper for the purple ones. (3) If the pictures are copyright, and most war pictures are, you will render yourself liable for damages and penalties if you copy them. It is not necessary that copyright pictures be marked "copyright."

A QUESTION FOR THE COUNTY COURT.—W. H. B. writes: "On July 1 I received a letter from a London firm of post-card publishers asking me if I could send them eight good prints of views of Barry Dock, &c., and asking for right of reproduction. They said if I would send good prints and permit, they would immediately send cheque, also stating they were in urgent need of them. I sent the views on July 5, and they were acknowledged on the 6th. I heard nothing further from them, so I wrote on the 15th, asking for cheque as promised. They wrote me again on the 16th stating the reason cheque had not been sent was because they had not finally decided which of the views they would use, but would send cheque in all probability at the end of that week or the beginning of next, which would bring it to the 23rd, at latest. They did not keep their promise, and so I wrote again about the 30th. In their reply, dated August 1, for the first time they make mention of not keeping the views, saying they would send the money if they kept any of the views, and also taking exception to the views and offering me less money than their first offer, the reason this time being that they were waiting to hear from their customer. I wrote again pointing out that it was the cheque as promised me in their first letter that I was waiting for. In their reply to that they give another reason for not sending cheque, viz., they were waiting to receive views from another photographer. I get a letter and views on August 7, and in that they simply state they are returning the views. I immediately return the views, and make a demand for payment of same. They send them back again (and the views are now in my possession), and state that they won't pay for views they are not going to use, and stating that they said all along payment would be promptly made for those views which were chosen. This latter statement is not true, as not till their letter of August 1 was there any mention of such a thing. I may mention they asked me for eight views and I sent them twelve to select from. They also say, 'You must be aware that first-class photographers are always ready to send views on approval when it is a matter of copyright.' That may or may not be so, but on the face of their first letter distinctly promising to send on cheque immediately I don't think they are in the right in keeping me all that time, and then in the end sending them back. I have threatened them with proceedings in the County Court. Under the circumstances do you think I am justified in suing them? I don't like to have anything to do with the County Court, but I do think they have treated me in a very shabby manner."—In reply: Your remedy is in the County Court, and we have little doubt that you will recover the sum agreed upon, supposing the facts be as stated. When you appear take all the correspondence with the firm with you. The matter looks like very shabby behaviour on the part of the firm, but probably it will pay up on receipt of a summons. Can you find out if your pictures have been utilised? When the case is tried we should like to have a report of the proceedings for publication.

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EX CATHEDRÂ.

Lost Postal Packets. A few weeks back we alluded to the Post Office regulations with regard to compensation for damaged and lost parcels while passing through the post. As we pointed out then, the damage to negatives, and such-like fragile things, is often more due to senders through careless packing, than to negligence on the part of those through whose hands they pass. Lost parcels are also often due to the senders, owing to their being insufficiently addressed, or not addressed at all. The Postmaster-General's annual report was issued last week, and from it we see that no fewer than 345,690 parcels were posted with no address whatever upon them, and, what is still more surprising, is that these contained cash, bank notes, cheques, bills, postal orders, and stamps to the amount of £7454. It would be interesting to learn how many of these unaddressed packets were from, or to, photographers. Is it not probable that some of the parcels that correspondents have complained of being lost through the post may be amongst the number that have been posted without addresses? As illustrating the carelessness of persons using the post, the report tells us that no less than £902, in coin, escaped from parcels while in transit through the post.

* * *

Permanence of Collodio-chloride Prints. In a leader last week we called attention to the effect that the enamel coating, or surfacing (baryta coated), on many of the papers used for the gelatino-chloride, or collodio-chloride, processes may have on the permanence of the prints. We see from the report of a recent meeting of the London and Provincial Photographic Association that the question of the permanence of collodio-chloride prints was raised. One speaker mentioned that he had some prints by this process that had faded within a year, while another had some that had been done for eighteen years, and yet showed no signs of change. Now the collodio-chloride process is generally admitted to be theoretically the most permanent of all silver processes, and practically it has proved itself to be so, inasmuch as the collodion itself forms no chemical compound with the silver, it being merely an inert material holding the silver emulsion in suspension. But this may not be the case if the emulsion is applied to a coating which, as we explained last week, may combine with the free silver in it. The major portion of the collodio-chloride paper sold in this country is made in Germany, and most of that made here is on paper made and surfaced (baryta coated) also in Germany. In the Photographic Section of the Victorian Exhibition at the Crystal Palace in 1897 were some collodio-chloride pictures, lent by Mr. George Bruce, of Duns, which were printed some twenty-eight years before that, and they showed not the slightest sign of fading. These were on paper prepared in Germany—Mr. Bruce used no other—but whether on a barvta coating or not, we are unable to say. In the early days of the collodio-chloride process baryta-coated paper was not employed; the paper used was the Rives or Saxe, as supplied for albumenising, and was merely coated with thin arrow-root paste before the emulsion was applied. We have recently seen a number of collodio-chloride pictures on paper, and on glass, that were made shortly after the process was introduced by the late Mr. G. Wharton Simpson in 1865,

and none of them show the least sign of fading. We are strongly of the opinion that, where a collodio-chloride print changes, the change is not due to the process, *per se*, but to the combination of the free silver in the emulsion with the "baryta coating," or rather with the vehicle by which it is held to the paper, as we pointed out last week.

* * *

Simple Method of Reducing Silver Chloride. The reducing action of calcium carbide on many metallic compounds is attracting attention amongst chemists, some metallic salts being found to take the form of a metallic button very readily, while in others there is not sufficient heat produced to get rid of the carbon, the result being metal in a finely divided form. Fortunately in the case of silver chloride, the result is highly satisfactory. According to Fr. von Kügelgen, a mixture of (of course, dry) silver chloride, with about one-fourth its weight of calcium carbide, reacts quickly when ignited with a match, and a button of metallic silver is left behind. We would suggest that any one trying this extremely simple method of reduction should at first experiment with small quantities of material, as there is always danger of admixture with some foreign ingredient which might convert the quick combustion into explosion.

* * *

The Photographophone. We lately alluded to some recent methods of reproducing for the future, sounds received upon one or other form of recorder. Our contemporary, the "English Mechanic," reproduces from the "Scientific American" a series of illustrations, with explanatory text by Ernest Ruhmer, showing the latter's method of recording and reproducing sound by means of a photographically produced band of what can only be termed symbols. In the first place a source of light acted upon by sounds is set up, and is then focussed upon a sensitive band, cinematograph-wise. When the sound to be recorded has started, the band is revolved, and a series of images of the light altered in height and volume by these various sounds is obtained. Then by an optical lantern the reverse process is worked, and the band images thrown upon a sensitive selenium cell in the circuit of a small dry battery. The varying images so influence the selenium that the current is transformed at the receivers into undulations corresponding with those that produced the negative. Mr. Ruhmer says the "sounds are reproduced with astonishing distinctness," and the loudness can be varied. "It is immaterial whether a positive be made from a film, or whether the original negative be used." He further points out that the invention is of considerable practical utility on account of the fact that any number of records, all equal to each other, can be reproduced by an ordinary printing process. It would appear certain that, if this apparatus should, in practice, bear out all that is claimed for it, it should cause a demand for films beside which photographic requirements would be merely trivial.

* * *

Electric Lamps. The use of small electric lamps with dry batteries seems to have become a practical success, and for many photographic requirements they ought to prove exceedingly useful. The pleasure of having a battery which will not spoil nor leak, and which when done can be renewed after the fashion of an accumulator, has not to be experienced to be understood. The amount of continuous use they are capable of may be understood when we say that there are already lamps of this type in the market for use with cycles, where, as we all know, certainty of illumination is of prime importance. The "English Mechanic" last week described and illustrated a new pattern of dry-cell battery and lamp now on the market. There is already a somewhat similar one, which, for the particular purpose, is awkward, the cells being put on the top of one another; but in this new form three cells are placed on one base as near to one another as possible, a horizontal section resembling a clover leaf, and the lamp takes its name from this. It is stated that the batteries are very cheap, and can easily be replaced.

* * *

A New Element Deduced by Photography. Sir William Crookes recently described before the Royal Society, the properties of a new metal which he had discovered and named Victorium. It has a pale brown colour, and easily dissolves in acids, its place being in the terbium group. Its main characteristics, however, are brought out by the aid of photography. The photograph of the spectrum given by the oxide shows certain definite lines, which appear to be quite new. The spectrum is obtained by the incandescence of the body in a vacuum tube; and the light emitted has been examined by a very powerful spectroscope, the result of exposure of a plate in the ultra-violet region giving a series of interesting lines. Some idea of the amount of labour bestowed upon this kind of work may be formed when it is learnt that, in order to examine the negative, an instrument capable of measuring to the one-hundred-thousandth of an inch has been constructed.

ON PREPARING PHOTOGRAPHS FOR BLOCK-MAKING.

If any Rip Van Winkle, just awake from a twenty years' slumber, were to stroll into a public reading-room with the idea of looking over the periodical literature to be found lying on the tables there, his first exclamation of surprise would be directed to the lavish manner in which most of the journals and magazines were illustrated. It is not an uncommon thing for the single issue of a sixpenny magazine, or of a weekly paper at the same price, to contain a hundred or more pictures. A very different thing it was a couple of decades back, when our friend Rip first went to sleep; and the revolution has been brought about, as we all know, by the introduction of the photo-process block. If our particular Rip Van Winkle happened to be an observant man, he would, upon careful examination of these illustrations, note that they varied in quality, and, upon extending his observations with a view to discover the probable reason for this, he would soon arrive at the conclusion that some of the photographs had been "blocked" just as they had come, hot from the camera, and that others had been submitted to a refining process of some kind before the block-maker had been allowed to work his sweet will upon them.

Rip would be perfectly right in his surmise. Some publishers will reproduce a photograph with all its defects, while others will go to any reasonable expense in adding

to its pictorial value by means of judicious touching up by the hand of an artist. Portraits executed by professional hands naturally form an exception to the rule, for they have already received, while in the negative state, any retouching that may have been required, but a large number of photographs used for press purposes are by amateurs, and there are very few of these that will not benefit by just a little nursing.

We may presume that the larger proportion of photographs submitted to editors for publication are in the form of positive prints on paper. A few firms of block-makers try and get the negatives to work from, and they must be commended for doing so, for it is obvious to all photographers that a picture must lose something in every step of its translation, and that the best effect must, in competent hands, be possible by working direct from the original negative. As, however, in nine cases out of ten, the negative is not available, or is only procurable with difficulty, and at risk of breakage in transit, the more common custom of working from the handy paper print is likely to continue.

Granting, therefore, that the block-maker has to be content with an ordinary photographic print from which to make his half-tone negative, how can we help him in the matter of touching it up?

The photographic surface, so far as it is represented by the familiar paper print, is not a pleasant surface to work upon with brush and colour, and more especially is this the case with regard to the shiny silver print or the P.O.P. And, unhappily, block-makers prefer to work from prints of a shiny description, presumably because they give a depth of shadow in the dark parts which is conducive to good results. For this reason a shiny print does not, as a rule, want so much working upon it as one which has a matt surface, like that of platinum or of bromide paper. But occasionally a P.O.P. print will have to be doctored so as to eliminate certain features which, although they may be disregarded as long as the picture is only a photograph, must be knocked out when it assumes the more important rôle of a newspaper or book illustration. Here is a case in point. The scene depicted is an Eastern one, the entrance to a bazaar, with the foreground occupied by hundreds of picturesquely attired natives. One or two of the figures in the immediate front have, presumably, come in at the moment the lens was uncapped, for they are terribly fuzzy through being out of focus. As the picture is not intended for exhibition at the Dudley Gallery, where such fuzziness is condoned, if not commended, we must get rid of these figures. At the same time it will be advisable to delete a flag in the mid-distance which has flapped in front of a building and made an unmeaning splotch. Other little accidents, which it will not be necessary to detail, can be remedied at the same time.

The picture is a silver (albumen) print of the old-fashioned type, and the first operation is to mount it on stiff cardboard. The water colour employed to touch it will run riot upon the smooth surface unless certain precautions are adopted. Some workers lick the paper with the tongue, but a pleasanter and neater way is to go over the print with a piece of soft sponge which has been charged with weak ammonia. This gets rid of any surface grease caused by contact with fingers, and if the colours employed be mixed with a trace of prepared oxgall the combined action of these two agents will remove the difficulty which would otherwise arise of making the colour "take" on the paper. The word "colour" as here employed is almost a misnomer, for the pigments used are mostly black and white, with the addition sometimes of a little Vandyke brown, as will be presently explained.

The white pigment employed should be Winsor and Newton's "Chinese white," for it is permanent, it flows easily from the brush or pen, and it possesses good "body." Other white pigments there may be, and very probably are, which answer this description, but we have met with some which have played us sad tricks. Drawings made some time ago with one of these have been utterly ruined, the high lights being now coffee-coloured instead of white. A wintry scene with khaki-coloured snow is not a pleasing thing to look upon.

Indian ink, rubbed down from the cake or in the liquid form, is a serviceable black, but lamp-black (moist in the tube), which, by the way, is only another form of the same pigment, can be used if preferred. A very pleasing and serviceable range of tints is obtained from aniline-black, mixed up with a few drops of water with a palette knife on the tile used as a palette, together with different proportions of Chinese white. Vandyke brown is used for mixing with the blacks for the deepest shadows, and solely for its photographic value.

The tools employed are sable brushes of different sizes, a black chalk pencil (sold under the title of "Special Correspondents' pencil"), and a drawing pen. This pen, used by engineers and architects for drawing lines of any thickness, is a most useful thing, and the way in which it is charged with colour, and is manipulated generally, is soon mastered. To help in putting in fine detail an ordinary pen is sometimes required, and we have found the best for the purpose a brand known as "James Farquharson's metallic pen, No. 20."

And now to work. If our landscape, the Eastern scene, should have a plain grey sky, we can much improve it by putting in a few fleecy clouds, or the suspicion of a light on the horizon. This is done with Chinese white. At the same time any spotting-out may be done by the application of a tint which matches as nearly as possible the tone of the photographs.

And here let it be noted that all these body colours, or tints, made up of Chinese white, black, &c., dry somewhat lighter than they appear to be when wet. The novice will sometimes not allow for this; indeed he will not recognise the fact, until he finds his carefully matched spotting-out developing into a most pronounced eruption upon the picture. It is therefore advisable, before much work is done of this kind, to allow one or two patches of colour to dry in order to see whether they match the tone of the photograph.

As already stated, a bromide or platinum print usually wants more doctoring than does one of the shiny kind. The shadows generally want strengthening, and this is best brought about by the use of Indian ink, mixed with Vandyke brown, with the addition of gum water. Do not use the common office gum for this purpose, but get some picked gum-arabic, put it in a bottle, cover it with water, to which has been added a drop or two of thymol. In a day or two the gum will dissolve, and it can be strained through muslin into another bottle for use. Bromide and platinum prints do not offer any great antagonism to the brush, and platinum

is the preferable medium to work upon. Bromide paper is sometimes rather rebellious, and, if it be of a kind with much gelatine in the emulsion, it can often be touched up more effectively with oil colour than with water. But oil colours are somewhat out of the common experience, and it is better on that score to leave them alone, unless the worker is familiar with their little ways. We have seen bromide prints brought up to a wonderful degree of finish by means of the brush charged with Chinese white and black.

There is one other medium which can be used in addition to the water colours already recommended. We mean "Stephen's Ebony Stain." This is largely used by black-and-white artists for their line drawings on Bristol board. It is an intense black, which dries with a gloss, and can be used on P.O.P., albumen, bromide, or platinum papers for the finishing touches in the deepest shadows. It appears to be a preparation of aniline, and will mix with Chinese white if different tints are required, but we prefer to use lamp-black or Indian ink for that purpose. But for brightening the shadows it has no equal. Ebony stain, in fact, should form one of the stock preparations in a photographer's workshop, where a good black, which will dry in a few moments, is required not only to touch up pictures, but to make good flaws in apparatus.

JOTTINGS.

If my friend, the Editor of that charming paper, *The Traveller* would devote some of his space to illustrating and describing the little coast town in Haddingtonshire, where I have been living the past few days, he would be doing his army of health-seeking readers a service. He might possibly entrust me with the commission if I directly suggested the idea to him. Whether I would accept it is another matter. In my present mood, probably not; strongly as I am convinced that the natural delights of my little town have only to be known to be practically appreciated by troops of health-seeking tourists, who have tired of stuffy English seaside places and over-crowded Continental resorts; I hesitate to entirely give away, even in the interests of my fellow-sufferers from the hardy annual disease, London *ennui*, the whole of the "find" that it has been my good luck to make. You can overdo even such a mild virtue as philanthropy of this kind. Who does not know Poppyland, the breezy, lazy, health-restoring district of the North Norfolk coast, which was "discovered" by a well-known journalist who had gone there for rest and quiet after a hard season's work in Fleet Street? Finding what he so badly needed, he let the readers of his paper have the benefit of his experiences, with the result that Poppyland was soon invaded by the holiday host, and the local lodging-house and hotel keepers are now amassing fortunes. On purely personal grounds I doubt if the discoverer of Poppyland is pleased that he spoke. He has, perhaps, benefited his fellows, not one of whom stops to thank him, or even cares to hear that he ever existed, but he has thrown away the prized power of secret possession. Poppyland might have been exclusively his to this day. One of the most frequented places on the Norfolk Broads is Potter Heigham, which I never heard of until a few years ago. This, too, was discovered by a sailing friend of mine who wrote most enthusiastically about its convenience as a centre for water touring in the English Holland. Now my friend is sorry he wrote, for the privacy and seclusion he once cherished are gone, and he has been crowded out of his old haunts by new-comers.

To wake up one morning and find my little town over-run by a crowd of well-dressed persons from Piccadilly—or Pentonville—is a state of things I am not anxious to bring about, so I am not inclined to be too communicative on certain points. My near neighbour is the Sirdar of the Egyptian Army, Sir Francis Wingate. That distinguished soldier is spending his annual holiday in my little town. The other day, according to the local papers, a certain noble Duke absolutely failed to get accommodation here. These two facts will show that the natural attractions of the place are appreciated by good judges. Cockney English has not caught my ear once during my stay. The visitors seem to be wholly Scotch. Situated on a promontory and indented by a rocky bay, there is always something doing seaward to keep one interested. In this respect my little town makes a great score; at some summer resorts that I could name you have only the far off ocean traffic to break up the monotony of the watery waste. But in my little town an endless variety of moving scenes passes in front of me. The girdle of red rocks against which the roaring waters are at present tumbling themselves in foamy impotence lead the eye round to the harbour mouth, under the old castle walls, from which the little fleet of dark-sailed herring boats glides out with the approach of evening. Twelve miles across on a rocky isle stands the great lighthouse, with its twenty million candle power illuminant which blinks on the walls of my room all night long. Beyond this mighty beacon rise the thin shadows of distant hills, and to my left ten miles across the water is the great Rock so familiar to travellers from London by steamer upon which white millions of Solan geese live and move. Indeed, through the telescope the swarm of creatures looks like a slowly swaying field of white feathers. Away up on the hills only four or five miles from my little town, and an easy walk before luncheon, a vast, gorgeous, glittering, wondrous panorama unfolds itself before my delighted eye. Half a kingdom seems to be lying at my feet. Sweeping round from the left, Arthur's Seat, twenty-six miles away, the Pentlands, the Perthshire hills, the Fifeshire coast, the Forth in its progress to the open sea, three lighthouses, and the majestic circle of the horizon line which carries the eye southward to the Berwickshire coast; all this is visible in one magnificent panorama to which, alas! photography is yet unable to do full justice. And glistening on the edge of the promontory, a reddish-brown cluster of rocks and houses, fringed with white foam, is the little town only three or four miles from which this glorious view is seen.

In the negative sense my little town has charms that are denied to larger coast resorts. The rocks are the undisputed vantage-grounds of the visitors. Two occupations alone are theirs: bathing and watching bathers. There is a gentlemen's "pool," a ladies' pool, and an "enclosure" under the castle walls, where the privilege of mixed bathing is to some extent permitted, or, at any rate, availed of. The wide-mouthed nigger is never seen on these rocks; there is no music but that of the splash of the waves; and the sellers of fruit, sweets, and newspapers, the fortune-tellers, the beggars, and the conglomerate riff-raff that infests southern sands and makes the life of the visitor a perfect misery to him (or her)—all this is invisible, for it happily comes not to my little town. The other day something like wonder, if not consternation, was caused by the appearance on the rocks of a man with a basket of cakes for sale. I don't know if the venture met with commercial success. Probably not, as, from what I could learn, the experiment was not repeated. He was not wanted by the visitors present in my little town of quiet and laziness. These desire nothing so much as to be allowed to bask and ruminate in the sun. When they are not bathing, the ladies sew, or dream. You can dream to perfection in this glorious air to the music of the waves at your feet. The other day a gun on the Castle Hill was fired, and the startled dreamers on the rocks looked resentfully towards the ancient piece of ordnance as if reproaching it with intruding its awful noise upon their realm of peacefulness. The world of itinerancy, as I have hinted, happily stays away from these Rocks, and thus the persuasive adherent of the collodion positive process, who takes your photograph *en plein air*, for the wholly modest and perhaps inadequate sum of Ninepence, is also invisible. Much as I love this man, my brother, I do not deplore his absence. If he feels inclined to invade my little rocky haunt, let me tell him that he would embark in a wild speculation of a very doubtful nature. For people seem to come here to escape him. I would recommend him Yarmouth, Blackpool, Trouville, Dieppe, Atlantic City—anywhere but my little town. As with itinerant professionalism, so with the amateurs, of which great and growing race only two have met my eyes here during the last ten days.

Still, notwithstanding the absence of the army of snapshotters, which you mostly see at seaside resorts in the month of August, my little town is full of photographic reminiscences and possibilities. Of the first, one deserves a special line of notice. It is a print of the late H. P. Robinson's Pall Mall exhibit of, I think, 1892, *Carolling*. Many of my readers will recall the photograph. It depicts two women, decked in the author's well-remembered "sun-bonnets,"

crossing a field and singing a song—"This Carol they began that hour." The line, I think, comes from Sir John Suckling. Of the other photographic reminiscences that confront me here, I cannot write without removing the curtain of privacy which my host and hostesses of the Rock know so well how to maintain. The stage in front of that curtain is a verandah looking out upon the rocky bay. From this point of view the photographic eye has full scope for exercising itself. The curves of the rocks as they stretch away seaward are too distant for my old-time photographic favourite—stereoscopic treatment. The telescope at my side, which picks out every detail of the lighthouse, a dozen miles or so across the blue waters, suggests the predominant photographic note. In fact my little town, or that particular part of it in which I have the happiness to reside, is not only panoramic but telephotographic. For both kinds of work there is splendid scope—particularly the latter—the most prominent objects in the bay being situated six or seven hundred yards away, while more remote features in the seascape lie ten or a dozen miles off. Perhaps the very finest subjects for the telephotographer are the natural and unconscious groupings of the holiday-makers on the rocks. As I look at them through my binoculars, I realise in a flash the difference between Scotch and English seaside resorts. At the latter the visitors are nothing if not self-conscious, at the former self-containment and the negation o self-consciousness visibly characterise the visitors. They live in, for and by themselves. What a change from the rapid vibrations of life at Brighton or Eastbourne, where the extremest self-consciousness is the rule, and not the exception!

A NORTH-EASTERLY gale lashes the sea into anger for a day. A small yacht with five persons on board fights an unequal battle against wind and wave and finally disappears off the Northumberland coast. The unceasing tragedy of the deep must be played, even in holiday time. With a sigh for the unfortunate people so swiftly taken from life by the caprice of the wind, one turns again to one's ordinary thoughts. It is only in snatches that I can take advantage of the splendid opportunities for photographic work that abound, for there appears to be a conspiracy amongst my friends to drag me away from my Rock on the smallest provocation and compel me to do some of the inland lions of the country. An afternoon at Greenwood, the residence of the Lady of Lammermoor, gives me the chance of photographing that very ingenious piece of farm-field machinery, the self-binder at work in the golden grain. The camera in my hand is American made, and I discover to my surprise that the self-binding machine which "does everything but talk," is also of American manufacture. How many more reproaches to British industry are we to expect from our Transatlantic brethren? Eschewing the softer delights of the Greenwood Tree my host and his *compagnon de voyage* disappear for the day, and at night under the lamplight I listen to the narration of adventures on precipitous rocks outstanding from a ruined castle on a lofty headland hundreds of feet sheer above the thundering surf. Photographs were taken amongst these dizzy crags in such circumstances that a false step would have meant precipitation in the cold dark abysses of the rocky shore. Happily my adventurous friends come through their dangerous climbs unscathed, and I am promised a sight of the prints when they are ready. There is something fascinating in the idea of planting a camera on a spot where in all probability a photographic instrument had never been placed before; but much as I admire the pluck and skill of my friend in his successful effort to scale the not easily accessible heights on which he proudly asserted the pre-eminence of his native country, I propose to leave him in undisturbed possession of his laurels, "I am not taking any."

PHOTOGRAPHY on the tops of giddy, slippery precipices is not to be lightly undertaken by the town dweller, who, for eleven months in the year exercises his feet on nothing wilder or more difficult than smooth hills overlooking the Thames Valley. In the current phrase the common objects of the photographic sea-shore are "good enough" for me. Certainly in the last three weeks I have had a wealth of choice for my camera. Here in the closing hours of a charming holiday I sit at the foot of my Rock and the blue-green sea with the yeasty lip is crooning that old, old song I love so well. What a world of enjoyment and movement I have crammed into the last four hundred and forty hours. Days and nights at York, Edinburgh, Glasgow—seemingly one moment in the old Mansion House of the first-named city, and the next in Lord Jeffrey's room at Craigcrook Castle two hundred miles off. Of exercises: cycling, driving, sailing, golf, and Ping Pong, the indoor sport of the HAUT TON. Of photography, every kind that I could wish for, but not enough time in which to do it justice. Absolutely nothing wanting to make my photographic tour happy, healthful, and smooth. What could be more satisfactory? Oddly enough, when I left for York on Monday morning, August 12, I was quite undecided where to go for a holiday after the Mansion House meeting. The Channel Islands; Normandy; Ireland; Filey; the Isle of Wight: these and other distant magnets exerted their influences upon me. But the old love triumphed: and the little town on the Rock has once more soothed and invigorated me. Where is that little town, and where that Rock, you ask? I name no names. Have I not already said that I will be no party to spoiling an unspoilt haunt of the lover of freedom, quiet and peace beside the eternal sea? Even so, I name no names of the kindly ladies and hospitable gentlemen who have so gracefully ministered to my enjoyment during my stay on the Rock, but to each and all of them I here tender my heartiest thanks for the mighty "good time" they have given me.

COSMOS.

DARK-ROOM ILLUMINANTS.

THE natural conservatism which seems inherent in the British nation has probably been one of the chief causes of the retention of the ruby light in the dark room, though it has often been pointed out that it is possible to employ other colours which are equally safe and give more illumination.

Unfortunately many of the glasses and mediums which are to be obtained commercially are neither safe nor brilliant, and those that are safe have as a rule such a great absorptive power for the illuminating rays, which are of course those in the neighbourhood of the yellow and yellowish green spectrum rays, that it is impossible to work in anything like comfort, and it is too often a literal groping in the dark to find anything. There is also another disadvantage incident to the use of these feeble illuminants, and that is that one has to examine the plate during development so close to the light that there is considerable danger of fogging it, for it must not be forgotten that although an ordinary plate—and by this term is meant one that is not colour-sensitised—is not specially sensitive to red and orange, yet it is not possible to expose any plate to any red or orange light for any length of time without obtaining some light action, and this usually in the undesirable form of general fog.

The red and orange light is undoubtedly a legacy from the old collodion days; but with an increased knowledge of the sensitiveness of plates, and the absorptive action of dyes, there is no reason why we should any longer be tied to commercial glasses.

Orange glass is principally of two kinds, a silver flashed glass and a dirtier orange pot made by stirring the molten glass with willow sticks, by which means the wood is charred and probably some compound of silica and carbon is formed, which gives the characteristic colour to the glass. The silver glass, which is the brighter of the two, exhibits when spectroscopically examined a strong absorption in the blue and blue-green, but passes violet, and, as can be proved photographically, a considerable portion of ultra-violet. The wood glass on the other hand exhibits a strong absorption in the ultra-violet and violet, and a weaker absorption in the blue, so that a combination of the two is much safer than either used alone, and the only objection is that the whole of the spectrum is considerably damped.

Many of the so-called ruby glasses in the market are ruby merely by suppression of the green and blue-green rays, and an experiment tried last week showed that with a panchromatic plate the spectrum could be photographed with an increase in exposure of only four times, and good density obtained reaching from B ½ C to D ¼ E, and from G to K in the ultra-violet.

Visual examination of a glass is of but little use, but by no means a bad visual test is to take a piece of stout cardboard and cut a small aperture in it, and then cover it with the glass to be examined, and then superimpose a deep cobalt blue or so-called violet glass; if the aperture can be seen it is almost safe to conclude that some of the active blue or violet rays are transmitted. Carrying this test further, it is of course extremely easy to place such a combination in contact with a plate, either in a dark slide or printing-frame, and expose to the actual light used in the dark room for varying periods of time, when it will be found on development how long it takes to obtain fog. For this purpose a long rectangular slit should be cut so that parts may be covered up at definite intervals.

The use of liquid screens for the dark room, which was so prominently brought forward by Howard Farmer in his paper before

the Royal Photographic Society last year, has not come into general use, solely, I believe, because lanterns thus fitted to take the cells are not general: so far as I know, two firms only having placed them on the market. There must be, however, many amongst your professional readers who have amongst their lumber disused wet-plate baths, and these can be very easily fitted to any existing dark-room lantern with a little ingenuity.

The home preparation of coloured filters is extremely easy, as it merely means the coating of a sheet of glass with plain gelatine solution, or even the utilisation of a spoilt plate or old negative, from which the silver can be readily removed by potassium cyanide or ferridcyanide and hypo, when, after a little washing, one has a sheet of glass evenly coated with plain gelatine, which readily takes any dye, and by using one or more of such dyed plates, light of any intensity or colour may be obtained at will.

I propose to give some suitable dyes and formulæ for dark-room lanterns, but it must be noted that they are in every case adjusted for artificial light, actually that of an eight candle-power incandescent electric light; but they are equally suitable for oil or gas, but can, of course, be then slightly reduced in intensity of colour, as the latter lights are by no means so rich in the actinic ultra-violet and violet rays as the electric light, nor this so rich as daylight. Although I have made no exhaustive experiments, I have found, however, as a general rule that practically double the intensity of colour is requisite for day as for artificial light, or if not actually necessary, then this may be assumed as a convenient standard.

Messrs. Lumière, the well-known dry-plate makers of Lyons, utilise green filters entirely throughout their factory, and this for their colour-sensitive as well as ordinary plates, and there is no doubt that, when one gets accustomed to it, it is as pleasant as any light to work with.

In making dark-room filters there is always one point to be taken into consideration, and that is whether one is content to work merely by reflected light only, or whether one utilises the direct rays of the lamp. In the former case a very much more brilliant light can be used than in the latter, and so much so that a light which would fog a plate within a minute can be safely used if the dish is kept covered and the lamp turned so that the light falls on to some reflecting surface, such as a wall, and thence on to the dish.

It must be distinctly understood that the following formulæ are only suggestive, for so numerous are now the aniline dyes that one has almost only to choose one of the desired colour to find that it will, with a little adjustment, make an excellent coloured filter, or, if not alone, then in combination with another.

Howard Farmer has recommended a six per cent. solution of potassium bichromate, which gives an absorption commencing about D $\frac{2}{3}$ E, and rising gradually to a maximum at F. Bichromate of ammonia is more soluble than the potash salt, and thus stronger absorbent solutions can be obtained. Aurantia and methyl-orange are slightly more absorbent of the green. Another excellent dye is known as cochineal red A, and in a solution of 1 : 500 this gives a complete absorption from D $\frac{1}{4}$ E; Biebrich scarlet is another good absorbent. Lately in Germany we have had introduced a specially pure dye, auramin, which in 1 : 1000 absorbs completely from E $\frac{1}{4}$ F, and it merely requires the addition of a little methyl-violet to give a screen that absorbs from C $\frac{1}{2}$ D completely; one of the most effective filters is obtained by making a saturated solution of Mandarin G extra, a dye specially recommended by Popowitzky, and another one suggested by Nagel is lithia carmine, made by dissolving $2\frac{1}{2}$ grammes of carmine in 100 c. c. of saturated solution of lithium carbonate.

For making dry screens, there is nothing better than, for pure red light, from A to C, to use one gelatine-coated plate soaked for ten minutes in a five per cent. solution of ammonium picrate, and another one in a one per cent. solution of methyl-violet, or one may be dyed with auramin or aurantia, and the other with the violet. For a green light, naphthol green should be used for one screen and auramin for the other.

In making coloured filters, I have found it more convenient to bathe three or four plates in different dyes than to mix them, for in the first place one is never quite sure whether the dyes will not act one upon the other; and secondly, there is no means of altering the light; whereas if two or three screens are used, it is extremely easy to lift one out or insert another, and thus obtain brighter or deeper illumination as desired, and the cost and trouble of making these screens is infinitesimal. There is also one other point to remember, and that is, that practically when we want to absorb a colour, we must use a dye of complementary colour, thus, red for green, violet for yellow, and vice versâ. Bearing this in mind, and with the simple practical test suggested above, it is extremely easy to make dark-room filters of any desired colour.

A. D. Pretzl.

THE CHEMICAL PROCESSES IN MERCURIAL INTENSIFICATION.

In the current volume of Eder's "Jahrbuch," which has just been published, Franz Novak, the teacher of physics and chemistry in the K.K. Lehr und Versuchanstalt für Photographie in Vienna, writes on the above subject as follows.

If finely divided metallic silver is treated with mercuric chloride, there is formed, according to Chapman Jones, the double compound AgCl, HgCl, silver mercurous chloride.

$$AgCl + HgCl_2 = AgCl,HgCl.$$

If ammonia is allowed to act upon this double compound thus formed, a blackening ensues. Chapman Jones analysed the black product and found in it silver, mercury, chlorine and nitrogen; the ammoniacal solution contained silver, a little mercury and chlorine. Chapman Jones came to the conclusion that double compounds of the formulæ

$$NH_2AgHgCl + NHAgHg_2Cl$$

were present in the black residue.[1]

M. F. Leteur[2] has recently published some noteworthy researches upon the action of ammonia on a mixture of mercurous chloride and silver chloride, in which the previously stated opinion of Chapman Jones on the action of ammonia on silver-mercurous chloride appears to be confirmed.

If ammonia is allowed to act on a mixture of a little silver chloride with much mercurous chloride, the silver chloride does not dissolve, some always remains in the black residue. In order to clear up this fact, Leteur carried out the following experiments: accurately measured solutions of mercurous nitrate and silver nitrate of known strengths were precipitated with hydrochloric acid. The one solution gave 0·0478 grammes mercurous chloride, the other 0·0483 grammes silver chloride. Then the mixture of silver chloride and mercurous chloride was treated three times, with vigorous agitation, each time for ten minutes with aqueous ammonia of the sp. gr. 0·96. The weight of the chlorides used in the experiment amounted approximately to one gramme, the quantity of the ammonia to about 30 c. c.

The results which Leteur obtained are given in the following table.

Total Weight of the Chlorides.	Silver Chloride therein.	Silver Chloride left behind.		
		After First Digestion.	After Second Digestion.	After Third Digestion.
0·959	0·290	0·224	0·213	0·204
0·958	0·193	0·187	0·185	0·180
0·957	0·096	0·093	0·089	0·085
0·956	0·048	0·044	0·044	0·040

A close examination shows that still, in spite of the repeated digestion with ammonia, considerable quantities of silver chloride remained undissolved; it will be further seen that from a second experiment nearly the whole of the silver chloride remained undissolved; each continued digestion with ammonia, extracted only very inconsiderable quantities of silver chloride. Also that a digestion with ammonia, sp. gr. 0·96, diluted with an equal quantity of water, produced no further solution of the silver chloride.

This proportion of the silver chloride left behind after the triple digestion to the total weight of the chlorides used amounts in the first series of experiments to:—

$$\frac{0{\cdot}204}{0{\cdot}959} = 0{\cdot}213, \text{ or about } \tfrac{1}{5}.$$

In the formula which Chapman Jones assumes for the reaction product of the action of ammonia on silver-mercurous chloride,

[1] "Journ. Chem. Soc. Ind.," vol. xii., p. 983.
[2] "Compt. Rendus," Bd. 130, No. 5, Jan. 29, 1900.

$$\left.\begin{matrix} \\ \\ \\ \\ \\ \end{matrix}\right\} N \begin{matrix} - Hg \\ - Hg \\ - Ag \\ - H \\ - Cl, \end{matrix}$$

the proportion of silver chloride to the total weight of the chloride used amounts to 0·233 for:—

$$\begin{aligned} AgCl &= 143{\cdot}5 \\ HgCl &= 235{\cdot}5 \\ HgCl &= 235{\cdot}5 \\ \hline & 614{\cdot}5 \end{aligned}$$

is the total weight of the chlorides which are necessary to form these compounds, in which 143·5 parts by weight of silver chloride are contained; therefore the proportion is as

$$143{\cdot}5 : 614{\cdot}5 = 0{\cdot}233.$$

This number 0·233 is very near that which Leteur found, wherefore actually Chapman Jones's view is supported.

A NOVEL FORM OF LANTERN POLARISCOPE.

[Paper read at the Franklin Institute.]

Owing to the high cost of large Nicol prisms, lantern polariscopes with stages large enough to take the regular mica and selenite designs, chilled glasses, &c., are now almost always made with bundles of glass as polarisers, and in order to avoid turning the lantern aside, as was necessary with the old elbow form of polariscope, an arrangement is used in which the rays are reflected forwards again after polarisation (as shown in fig. 1), in which A is the source of light;

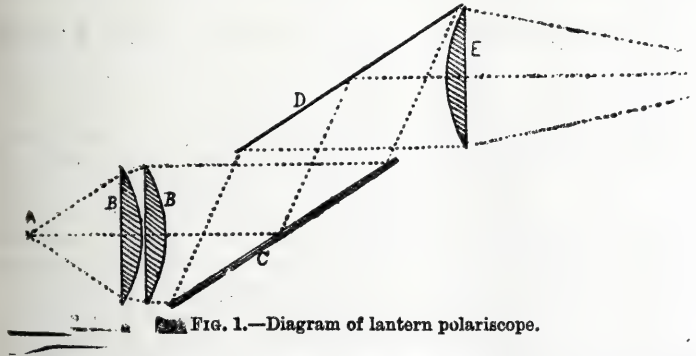


Fig. 1.—Diagram of lantern polariscope.

B B condensing lenses for parallelising the light rays; C the bundle of glasses for polarising by reflection at the angle of 57°; D a silvered mirror; E a convex lens for bringing the light rays to a focus within the small Nicol prism used as an analyser. The stage is just in front of E, and is not nearly as convenient for many purposes as a horizontal stage would be.

For my own use, and to meet certain special requirements, I recently constructed a lantern polariscope in which the position of the reflecting surfaces C and D is so altered as to bring the stage into a horizontal position, and at the same time that portion of the light transmitted by the glass bundle is utilised for ordinary projection purposes, and ordinary slides or other optical demonstrations can be interspersed with or superposed upon the polariscopic projections. This instrument having attracted some attention and been favourably commented upon when used at recent meetings of the Institute, I have been induced to furnish the following description for publication:—

The general disposition and appearance of the instrument is shown in fig. 2, in which A is a light wooden platform; B is a "right angle" hand-feed electric lamp, as made by the McIntosh Company, of Chicago; C is a light, rectangular wooden box, with hinged lid, containing the polarising and silvered reflectors, and carrying the condensers and stages. D is the polariscope objective, analyser and right angle reflector, and E is the objective for ordinary lantern slide projection; F is a small ground glass upon which is projected an image of the electric arc, through a "pin-hole" opening in the sheet-iron hood.

Fig. 3 is a horizontal section of the box C of fig. 2. A A are the condensers for parallelising the rays from the source of light. This condenser system should be perfectly aplanatic for the best results, but the combination indicated in the plan answers very well with the electric arc light. B is the polarising bundle, made up in my own

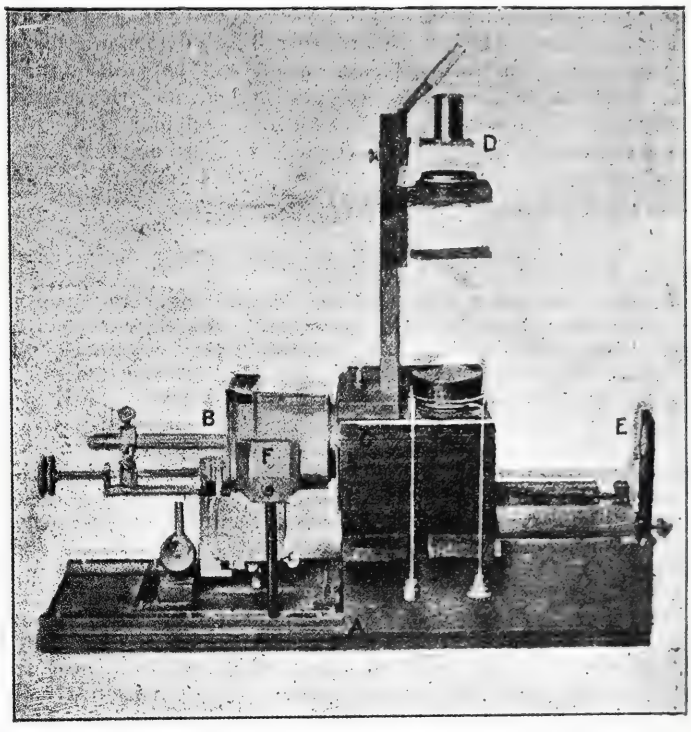


Fig. 2.—Ives' lantern polariscope.

instrument of twelve sheets of special extra thin polished plate glass. The twelve sheets make a bundle $\frac{3}{8}$ of an inch thick. C is a silvered mirror so inclined in the horizontal plane as to project the polarised rays vertically upwards through a condensing lens, which cones them into the objective and analysing prism. D is the condensing lens for coning the direct rays into the objective for ordinary projection. The objective which I use is a single plano-convex achromatic lens, which

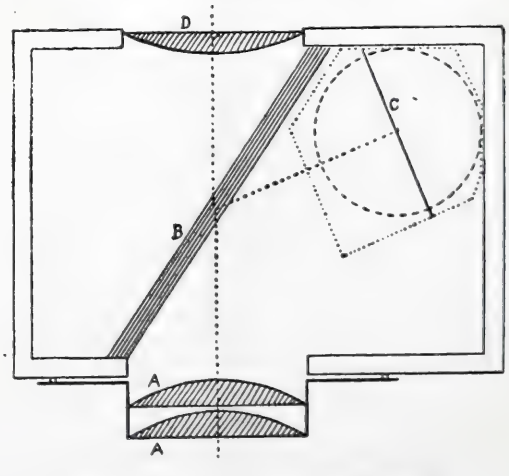


Fig. 3.—Plan of Ives' lantern polariscope.

is perfectly efficient with the electric arc light if the condenser is of suitable focus. It is attached to the box in which the analyser combination is packed, and which slides within the lantern base to focus. Both objectives are supplied with a simple form of shutter.

The objective for polariscopic projection is of somewhat longer focus than that for ordinary projection, giving a smaller disc, and so making the illumination of the two discs about equal. By removing

the glass bundle, which can be done in a moment, all of the light can be sent through the front condenser and used for spectrum or microscope projection, in which as much light as possible is desirable. By substituting a silvered mirror for the glass bundle, and removing the analysing prism, a vertical lantern is produced, which also utilises all of the light.

The box C (fig. 2) and its attachments may also be lifted off instantly to substitute the lantern kromskop, or any other special device for projection.

The apparatus which I use has only 3-inch diameter condensers, which serve my purpose, but it can just as well be built on a larger scale if desired, in which case the horizontal stage of the polariscope can be lifted up to a smaller part of the cone of light, in order to project the ordinary sized objects in the most brilliant manner.

FREDERIC E. IVES.

FOREIGN NOTES AND NEWS.

Resin Fumes a Sensitiser.—In an interesting paper on the Lippmann process by Dr. Neuhauss in the current volume of Eder's "Jahrbuch," a large number of experiments are detailed as to the action of particular dyes as sensitisers for individual parts of the spectrum for Lippmann plates, but at the end of the said article the author, referring to the general sensitiveness, points out how little this is, and though confirming the statement of Valenta that a supplementary silver bath does increase the general sensitiveness, he points out that the plates must be used at once, or else they become foggy. Towards the end of last summer Neuhauss tried the experiment of warming the plates, and found when the plates were placed in a zinc box with a wooden cover, with a small gas flame under the box, they increased considerably in sensitiveness when left therein for one night, but that a longer stay also induced fogginess. In order to find out the cause of this, Dr. Neuhauss heated the box to 60° C. and observed a strong smell of resin, which, of course, arose from the cover, and when this was replaced by cardboard, and the box again heated, there was no increase in sensitiveness, hence Neuhauss concludes that the vapour of resin is a sensitiser. It will possibly be recalled by some of our readers that about 1892 Lenhard and Wolff suggested the use of a preliminary bath of an aqueous solution of turpentine for the same purpose.

The Ammonium Persulphate Reducer.— Professor Namias gives a brief account in Eder's "Jahrbuch" of his researches on the use of the above salt and strongly recommends the following formula:—

Ammonium persulphate	30 grammes.
Alum	50 „
Water	1000 c. c.

The addition of the alum acting as a restrainer upon the solvent power of the persulphate. Namias also combats the idea, advanced by several writers, that the black precipitate formed on the addition of ammonium persulphate to silver nitrate is metallic silver, and states that he has proved it to be a hyposulphate of silver, and further that a neutral or alkaline solution of ammonium persulphate acts precisely the same as an acid solution, only it is slower. He also suggests that by the use of the ammonium persulphate it is very easy to obtain contretypes, and that it is also a valuable means for correcting over-exposure in carbon printing, and says that it acts by converting the chromic oxide into chromic acid, and incidentally says that it is a good test for chromium. The chemical equation representing the action of the persulphate on the chromic oxide is as follows:—

$$Cr_2O_3 + 3(NH_4)_2S_2O_8 + 3H_2O = 3(NH_4)_2SO_4 + 3H_2SO_4 + 2CrO_3$$

Finally he points out that ammonium persulphate is a far better etching solution than any acid for zinc, copper, and aluminium, and will therefore be useful in photo-mechanical work. When it is to be used for copper, the solution should be made alkaline with ammonia. For the reduction of prints, too, he strongly recommends a 0·5 per cent. solution with one or two per cent. ammonia to be used before toning and fixing.

A New Panchromatic Sensitiser.—Herr Valenta has been continuing his researches upon the aniline dyes as regards their sensitising action on silver bromide, and in the last number of the "Photographische Correspondenz" he gives details of a series of dyes obtained from Holliday and Sons, of New York, and amongst these is one called Titan scarlet S, which dissolves readily in water and alcohol with a scarlet-red colour, and a strong solution absorbs the whole of the spectrum from C ½ D to the ultra-violet, and it would therefore be a useful colour-filter for trichromatic work. As a sensitiser, when used for bathing plates in a strength of 1 : 40,000 with two per cent. of ammonia, with a good exposure an absolutely closed band from B to H is obtained. If to every 100 c.c. of the bath one or two drops of a 1 : 40 silver nitrate solution be added, the action is much stronger, and from the illustrations given we should say that Valenta is correct in his statement that this is the best sensitiser known to make a panchromatic plate.

Filters for Trichromatic Work.—Dr. Eder recommends as a green filter for trichromatic work, with an erythrosin sensitised plate, a solution of Janus green and auramin as follows:—

Solution of Janus green 1 : 1000	8 c.c.
Auramin solution 1 : 2000	14–16 „
Water	100 „

For the red filter he uses

Tolan red 1 : 4000

or

Naphthol orange 1 : 500.

both in a thickness of one centimetre. With regard to this green filter we would point out that absorption of Janus green is confined from about C ¼ D to D ½ E, so that it permits the whole of the red and orange from A to C ¼ D to pass, whereas naphthol green absorbs the whole of the red. Probably, however, as the plates that should be used with the green filter are not sensitive to red, this may be ignored.

THOUGHTS CONCERNING THE NATURE OF THE LATENT IMAGE.

II.

As nothing inconsistent with the sub-haloid theory had been proved by the experiment of subjecting the latent image upon a collodion plate to the action of bromine, it seemed not without reason to continue the investigation by the synthetical method, and add sub-bromide to the collodio-bromide emulsion. Although this had not given any positive result with gelatine emulsion, the difference between gelatine and collodion emulsion in many other processes suggested that it might lead to something decisive concerning collodio-bromide of silver in conjunction with other facts. I prepared some grainless silver in collodion, and from it some sub-bromide, but found that collodio-bromide emulsion could not be easily reduced by a developer dissolved in alcohol. The rapidity with which reduction took place, when the developer, plus ammonia, was dissolved in water, seemed to offer insufficient guarantee for the fineness of the grain, and I therefore merely reduced nitrate of silver dissolved in collodion. Five grammes of silver nitrate dissolved in 5 c. c. of water and 25 c. c. of alcohol were added to a solution of 10 grammes of pyroxyline in 200 c. c. each of alcohol and ether. To this 1½ grammes of hydroquinone dissolved in 20 c. c. of ether, and 5 c. c. of ammonia (sp. gr. 0.910) diluted with 25 c. c. of alcohol, were successively added.

The emulsion reduced in this manner resembles the gelatine emulsion, being grainless and dark brown in colour. It was poured in a fine stream into water, and well stirred, then washed in running water for 24 hours, and the water extracted by immersion for two hours in several changes of alcohol. The pellicle was then dried superficially and dissolved in hot glacial acetic acid. It did not seem safe enough to bromise it in alcohol, lest the latter might be acted upon by the bromine. The colour of the silver emulsion in glacial acetic acid was reddish-brown. It was then slowly converted at 40° C., by a solution of bromine in 10 parts of glacial acetic acid, in such a manner that we again had 2Ag to 1Br.

In this process the silver collodion emulsion first changes in colour to blue-green, then to dirty olive-green, and finally to greenish-grey. After the emulsion had stood 10 minutes it was freed from acid by again precipitating it in water and washing it with water for 24 hours. After repeated treatment with alcohol it was again dissolved in ether

and alcohol, and the emulsion was then added in various proportions to several portions of collodio-bromide emulsion.

The result which might be expected from hypothetical sub-bromide of silver actually occurred. It was found that the addition of a small quantity of bromised silver produced upon development a very decided reduction of the silver bromide forming the stock emulsion, the plate being completely blackened. Of course, a plate coated with silver bromide emulsion only was used to check the experiment, and another, to which a similar quantity of bromised product had been added, was merely fixed. As in all experiments of such importance, I repeated the process of preparing sub-bromide in collodion, by starting again at the beginning, and in so doing I thought it might be interesting to ascertain the effect of the intermediate product (the metallic silver) upon a collodio-bromide emulsion. The result was a surprise. The silver had precisely the same effect as the bromised product. The support of the sub-bromide theory was gone, and one for the nascent silver theory had been found.

The question appeared to be of such theoretical importance that I endeavoured to ascertain the possibility of a source of error. Notwithstanding the precautions which had been taken, it might be due to fogging of the silver bromide by certain products which the collodion had retained through want of amenability to diffusion of the broken-up pellicle. The most simple course seemed to be coating plates thinly with emulsion and washing them in the usual way for the next set of experiments, rather than purifying the emulsion containing reduced silver by precipitation. The washed plates were then immersed in alcohol, and the film was scraped off and dissolved in alcohol and ether. In this case, also, it was found that the silver reduced by the hydroquinone, which had been added to the emulsion, invariably fogged the plate completely. To be quite certain that the fogging action was not due to any product of decomposition of the developer, I tried reducing the silver nitrate dissolved in collodion, by means of pyrogallol and likewise formaldehyde, but with the same result. Sulphate of iron was also tried. In consequence of the insolubility of the oxalate of iron salt in alcohol, the experiment was made by immersing the collodion film containing the silver nitrate in a 30 per cent. solution of sulphate of iron. It was then washed in acidulated water, next in running water, and after the water had been extracted with alcohol the film was dissolved in alcohol and ether. The silver reduced by iron is of a whitish-grey colour, whilst that reduced by hydroquinone, pyrogallol, and formaldehyde is of various shades of colour, ranging from greenish-brown to ruby-red. As silver reduced by iron behaves in the presence of silver bromide emulsion in the manner we have already described, every possibility of doubt is excluded that silver prepared in this manner acts as the nascent silver theory presupposes with regard to nascent silver. The action of bromised silver in regard to the sub-bromide theory is rendered inconclusive by these results, because the bromine product may always contain silver, and the removal of this substance from the emulsion seems impossible.

The chief argument against the nascent silver theory was based upon the indestructibility of the latent image by means of nitric acid. Eder used in his experiments a collodio-bromide wet plate with excess of silver nitrate, and laid stress upon the fact that nitric acid was present at the time of exposure. Eder came to the conclusion that highly concentrated nitric acid did not destroy the latent image.

In repeating the experiments I thought the presence of nitric acid undesirable, as the problem of the latent image could only be decided for a special instance of quite peculiar character.

To ascertain the behaviour of collodion emulsions in presence of nitric acid, I used the latter in more dilute form (acid, nitric, sp. gr. 1.153, diluted with an equal quantity of water, consequently a solution containing 12.5 per cent. of HNO_3). The coated plates were wetted, drained, and dipped for one minute in the acid, and then well washed. As in the previous experiments, this was done alternately, before and after exposure. A plate not treated with acid was always exposed and developed simultaneously with the others. It was found that the plate dipped in nitric acid before exposure gave a precisely similar image to the undipped plate, whilst the one treated with acid after exposure only gave sufficient density in the high lights. The half-tones were thin, and looked as though they had only received one-fourth the exposure of the check plate.

Upon using acid containing 33 per cent. of HNO_3, the plate dipped before exposure again gave an image resembling the undipped plate, whilst the one treated with acid after exposure only showed a slight deposit in the high lights. Nitric acid of this strength readily dissolved the fine particles of silver of a Lippmann colour photograph, but not the deposit of which a collodion emulsion negative is formed. This led me to play the last trump by using concentrated nitric acid, sp. gr. 1.4=65 per cent. HNO_3.

Acid of this strength visibly attacked the collodion at the edges. The latent image completely disappeared, but the plate dipped before exposure still gave a vigorous negative, although it appeared to be rather less exposed than the undipped plate.

The possibility of destroying the latent image by nitric acid must therefore be conceded in the exceptional case of a collodio-bromide emulsion without excess of silver, and this disposes of one of the arguments against the nascent silver theory. It is true we are moving in a vicious circle, if we wish to prove the fact of their presence by suppositions concerning the reactions of hypothetical substances, such as sub-bromide. Consequently I merely wish to recall the fact that the reaction of sub-bromide has for a considerable time been accepted in the following form[6]:—

$$4Ag_2Br+6HNO_3=4AgBr+4AgNO_3+N_2O_3+3H_2O.$$

If this reaction be correct, the nitric acid experiment would be of no value in deciding between the nascent silver and sub-bromide theories, and since Otto Vogel, in another place, confirms the reaction, as given above, for his sub-haloid, we have some reason to assume that any sub-bromide which may be present in the latent image would also be destroyed in the treatment with nitric acid.

We will now shortly sum up the results before we proceed further with the investigation.

1. The use of bromine is purposeless for deciding between the two theories, as metallic silver as well as sub-bromide are converted by it to normal bromide of silver.

2. The nitric acid experiment is likewise useless, because, according to the views which have hitherto been accepted, metallic silver as well as sub-bromide are converted by nitric acid. In addition, the latent image, when associated with collodion emulsions, is destroyed by nitric acid, and, as Eder's investigations have shown that the latent image upon a wet collodio-bromide plate, with excess of silver, is not destroyed by nitric acid, we have here another interesting example, showing that the idea of the latent image must not be taken offhand as identical in all its varieties.

3. The synthetical experiment (addition of metallic silver and sub-bromide to the bromide emulsion) shows an essential difference between gelatine and collodion plates. With collodion emulsion, metallic silver, as well as sub-bromide, bring about reduction, but this is not the case with gelatine emulsion.

Can anything definite be deduced from these results in favour of either of the theories under consideration? I think not. Although the addition of grainless silver to the collodion emulsion brings about a reduction of silver bromide in development, it is not necessary that metallic silver should be formed by exposure to light, and, though I am glad to admit that I have rescued one experiment, which had been refuted by the opponents of the nascent silver theory, I do not believe that I have strengthened its position in so doing.

The possibility of the physical development of a plate fixed immediately after exposure has been adduced as an important confirmation of the nascent silver theory, but in my opinion this is not quite correct. From the earliest days of photography we have proofs that vapours, or solid bodies in the nascent state, deposit themselves only upon the exposed portions of solid bodies, without presupposing the occurrence of any chemical change during exposure, so far as our scientific knowledge goes. In 1842 Moser propounded a theory of Daguerreotype, according to which it was not a chemical process, but due to the condensation of vapour of mercury, in the same way as ghost images are formed, and he found that an image could be developed upon a Daguerreotype plate by using aqueous vapour. The interesting experiment by Waterhouse, which excited so much astonishment at the Paris Exhibition, is of this nature. Waterhouse obtained an image by exposing a plate of pure metallic silver, and developing it in the mercury box. In such a case it is quite contrary to our views to assume that a chemical change in the metal may have been brought about by light.

Moreover, I should also mention that the possibility of development after fixing, if even the presence of silver particles had been established, would have proved nothing of importance in favour of the nascent silver theory, because hypothetical sub-bromide, according to

[6] Eder's "Handbuch der Phot. ii." part 6, p. 53.

our supposition, is divided into metal plus bromide by treatment with thiosulphate of soda.

If we are unable to accept either the nascent silver or the sub-bromide theory, we must, for further study of the nature of the latent image, consider the question whether there is reason to believe that exposure to light causes a reduction of silver bromide or any chemical change whatever. Doubtless there are many reasons in favour of the assumption of a chemical change. It is easy to prove by smell that prolonged exposure of a bromide film causes the liberation of bromine, if we expose a dry plate for a few hours to bright daylight. It must also be admitted that the phenomena of solarisation can more easily be explained, as Eder has stated, if we assume that a substance is formed during exposure with properties placing it intermediate between silver and silver bromide, but this cannot be taken as an important argument in view of the indistinct conception we have of the process of solarisation.

It must also be acknowledged that the theory of chemical sensitisers presupposes absorption of bromine, and its consequent liberation during the time of exposure, but our theory of sensitisers may also be incorrect. If we consider that the most important chemical sensitiser is silver nitrate, we must concede that the absorption of bromine by silver nitrate is plausible, but we must not forget that we have in opposition to this a totally different range of sensitiveness in collodion emulsions, according to how we prepare them, whether by formation of silver bromide in presence of excess of silver, or bromine : and subsequent removal of every trace of excess of silver. The physical modifications of silver bromide differ so enormously that, in my opinion, the most important problem in photography appears to be, "What is upon the plate before exposure in the various instances of different kinds of silver bromide?" rather than "What is formed by exposure?"

My experiments relating to the incorporation of molecular silver with emulsion also show how different quite analogous cases in photography turn out to be from a chemical point of view. It would be difficult to decide whether the chief factor should be sought in the different condition of the silver bromide, or that of the metallic silver, as the incorporation with gelatine emulsion of the silver from collodion, or with collodion emulsion of silver from gelatine, cannot be effected without using a fresh medium, say, an organic acid, as in the so-called Vogel process, but this would involve totally different conditions.

I was enabled to ascertain by the use of collodion plates that bromine affects the latent image more than it does bromide of silver, even before exposure, as the absorption of bromine by the medium is excluded in the case of collodion. Still there was evidence of very strong action by the bromine upon the silver bromide, and, so far as our knowledge goes, this was physical. It is possible, therefore, that the action upon the latent image is only physical, and that it may be stronger when the bromide of silver has been changed molecularly by the action of light.

How can we possibly explain the colossal difference in the sensitiveness of silver bromide if we assume that the development of the latent image is a simple chemical process? In discussing chemical sensitisers Eder writes:—"The cause of the high sensitiveness of gelatine emulsion seems, however, to be ascribable principally to the formation of a special definite modification of silver bromide." How much weight do we find attached in this statement to the theory of chemical sensitisers? In the case of a collodio-bromide emulsion without excess of silver we have no sensitiser; yet there is very much greater sensitiveness than in a gelatine emulsion of fine grain suitable for the Lippmann colour process, notwithstanding the fact that we have gelatine present in the latter as a sensitiser. There can be no doubt that gelatine absorbs bromine, but there is no proof whatever that bromine is liberated during the short exposure that is given in the camera. If we take into consideration that the difference in sensitiveness between an emulsion for the colour process and that of a modern instantaneous plate is as 1 to 20,000, what meaning is there left in our theory concerning gelatine as a sensitiser?

We might satisfy our want for a cause by taking Liesegang's deduction into consideration. He endeavours to explain it as a kind of fermentary growth of the particles which are first reduced, transmitted by purely chemical means to the silver bromide by the formation of larger aggregates, "or in a certain measure, chemical units" ("gewissermassen chemischer individuen"). Sensitiveness in a certain manner goes hand in hand with size of grain, and this consideration, which is quite true, would satisfy our mind to some extent, but we must not forget that there are very coarse-grained varieties of silver bromide, and they are exceptionally sensitive. The only consequence that would likewise follow from Liesegang's formula is that density would be greater with a coarse grain, because more particles of silver forming the grain would be reduced at starting. But it is well known that this has very little to do with high sensitiveness. In the bromine experiment with the collodion plate before exposure there was a considerable loss of sensitiveness, but it was impossible to form any conclusion in the case of the gelatine plate, because bromine had been absorbed by the gelatine. It would be difficult to ascertain whether the chemical sensitiser itself, or the silver bromide, had suffered through the alteration in the gelatine. Observations of the action of nitric acid upon gelatino-bromide plates again disclosed very interesting results, but really nothing positively decisive concerning the question. The often-repeated experiment concerning the action of nitric acid upon gelatino-bromide of silver with regard to the latent image was made with the object of determining if metallic silver was present in the latent image, but the experiment was of no avail in this direction, as the gelatine was destroyed by using acid of sufficient strength to dissolve the silver. But it is remarkable that a secondary effect appears to have been overlooked by other experimentalists, although it impressed me very much in repeating the experiment.

An exposed gelatino-bromide plate was dipped for half a minute in rather dilute nitric acid (1 part of acid. nitric, Ph. G. + 5 parts of water). A broad strip was protected from exposure, as in all my experiments. The gelatine suffered considerably in the bath, but still held together on the plate. After thorough washing the plate was developed simultaneously with another, which had been coated with the same emulsion, but not dipped in acid. Contrary to expectation, the plate which had been treated with acid blackened all over, whilst the check plate, of course, remained unaffected at the margin, where it had not been exposed. The officinal nitric acid still gave the same result, even after it had been diluted 10 and 50 times, although there was no apparent action upon the gelatine, and the dilution had to be increased to 500 times before any action of the kind was eliminated. A veiling action upon the unexposed silver bromide was also observable with sulphuric acid, but it did not appear to attack the gelatine so readily, nor to give as much fog. A 10 per cent. solution of sulphuric acid seemed to be about equal to a 2 per cent. solution of nitric acid of the pharmacopœia. A 5 per cent. solution of ammonium persulphate acted similarly to these acids.

It is more difficult to understand that three agents, so chemically different, act in the same way upon silver bromide, than if we regard it as a reaction upon the gelatine. We thus have another interesting fact which is difficult of explanation. The process of development needs as much elucidation as that of exposure. Although the gelatine, which forms the envelope, is but slightly attacked, the silver bromide is immediately affected by the developer, just as though it had been exposed to light. This is still more remarkable than the fact to which I recently drew attention, that substances which are not developers, such as gallic acid and formaldehyde, reduce precipitated silver bromide in the absence of a colloidal body, with the greatest ease, whether exposed to light or not. It is incomprehensible that a chemical change can have been effected in the silver bromide by the dilute acid or the persulphate, and there is no ground to suppose that a physical change can have occurred. A change in the gelatine may therefore be postulated in this reaction, especially in consideration of the fact that silver bromide in collodion does not appear to be affected in the least by the strongest nitric acid.

It thus appears that the formation of the latent image is not a simple process. Several processes seem to take place concurrently, and the "substance" of the latent image also appears to vary in various photographic processes. We cannot affirm positively that the process is a chemical one, and we have as little reason to infer from the facts that a purely chemical change in the silver bromide occurs, since the properties of the medium appear to exert a species of chemical influence.

Perhaps further experimental investigations may at no distant date give us nearer clues, and lead to a true theory of the latent image. I think I have shown that very little can be done with our present hypotheses.

Charlottenburg, November 13, 1900.

THE SENSITIVE COMPOUNDS OF THE CHROMIUM FAMILY.

The action of sunlight on uranium chloride was noticed as far back as 1804 by Gehlen, who found that an alcoholic solution of this salt was rendered turbid on exposure. In 1900 Elbemen observed that an aqueous solution of uranic oxalate gives a violet-brown flocculent precipitate in sunlight, and that uranium acetate behaves in a similar manner, more particularly in the presence of some organic body, such as alcohol, ether, etc. Thus nearly a hundred years previously, before even photography could lay any claim of interest to uranium, practically the same experiments had been carried out, the only difference being that in the previous work an inorganic salt was used instead of an organic salt of the metal.

Uranium nitrate was employed by Poitevin in 1859, in conjunction with ferric chloride, the image produced being developed with tannic or gallic acid. Six years later—in 1865—some important experiments were written about in The British Journal of Photography by E. J. Reynolds, in which he not only used uranium, but the salt employed was one of an acid from the uranium group of metals. In this article the effects of light on "acid uranium chromate" and "uranium bichromate" were discussed.

After 1873 uranium nitrate was used to sensitise collodion, albumen, starch, etc., by J. Werge and others; and about this time uranium bromide was also employed to precipitate silver nitrate for plate work, but inasmuch as an excess of silver nitrate was apparently always present, there would be no possibility whatever of ascertaining the effect produced by uranium bromide. Colonel Wortley, amongst others, claimed certain advantages both for "fineness of effect" and "speed" in using uranium nitrate with the collodion for plates.

The use of uranium toning, and subsequently iron, by M. Niepce is also of interest. In 1889, Alleyne Reynolds suggested a method of combining uranium chloride and chloro-platinite of potassium, but after this date no advances of any importance seem to have been made until Becquerel discovered (1896) the power possessed by salts of this metal of emitting certain rays which will pass through opaque objects, and may, therefore, be reasonably compared with the so-called Röntgen rays.

According to Dr. Vogel's "Photographie" (1900 edition) Niepce used uranium nitrate in 1858; but he also states that in 1857—a year earlier—Burnett was acquainted with the sensibility to light of uranium salts. It is, therefore, evident that he had experimented with other salts than the nitrate, which unfortunately so few others have done.

The chromium compounds with potassium, sodium, and ammonium of the dichromate type may justly be placed second in importance to silver salts, as without them ordinary colloids would be insensitive to light. And further, as chromium chloride and uranium chloride are both reduced by light, it is only natural that the chlorides of tungsten and molybdenum should be affected also. One cannot help regretting that so much time, comparatively, has been spent on uranium haloids and organic salts of uranium, while it has not apparently been considered worth while to investigate the salts of the other metals of the sub-group. The salts of molybdenum are very sensitive to light, and from the few preliminary experiments with them that I shall mention shortly it will be seen that the metal is of almost as much value from the photographic point of view as uranium itself.

A normal or weak solution of gelatine gives the same diffusivity rates for solutes as ordinary water containing no gelatine, even when in a state of jelly, and it can therefore be assumed that there is intercellular communication in its structure. It is possible that in consequence of this, dichromatising has the effect of closing up the cells on exposure to light and so retaining the pigment that may have been mixed with the gelatine, and further, it seems possible that this "closing up" is caused by the reduction of the dichromate to an insoluble compound, as well as the oxidation of the colloid.

This explanation is strengthened by the results of such experiments as those of Elbemen, in which a uranium salt brought about the precipitation of a colloid in solution when exposed to light.

Just as potassium dichromate or any other dichromate may be used to sensitise the gelatine or colloid, it would seem possible for potassium (etc.) di-tungstate, di-molybdate and di-uranate to be employed also. But apart from the difficulty of preparing di-tungstic and molybdic salts, their application seems to be both limited and uncertain; and further, the uranium compound of the formula $K_2U_2O_7$ is insoluble in water.

One interesting thing, however, occurs with the molybdenum salt. On treating ordinary "ammonium molybdate" with concentrated sulphuric acid (with a view to obtaining a dimolybdate), a colourless liquid is formed, which gradually turns to a very beautiful blue colour. Moreover, if some of this liquid be mixed with water (soon after its formation), its colour is destroyed, but this dilute solution assumes about three weeks the same blue colour; of course it gradually turns blue, but in about three weeks the colour is quite as dark as that obtained with the concentrated solution.

I have tried soaking ordinary carbon tissue in a diluted solution of the ammonium molybdate treated with sulphuric acid, but could obtain no result whatever, and I think the reason is that there was really no dimolybdate present at all. I also mixed a few drops of the concentrated blue liquid with some fish-glue and carmine, and then applied the mixture to paper, and exposed it under a negative. The result here was the formation of an image of a darker tint, that of the paper originally, but the exposed portions of the glue did not appear to be raised, or sticky, and on washing the print most of the image dissolved. Hence it seemed that the image was merely one of the molybdenum salt.

I have further tried to make the di-molybdate by dissolving "molybdic" acid in concentrated ammonia, and evaporating the liquid down. The mother liquor is poured off from the first crop of crystals, which consist of ordinary ammonium molybdate [$(NH_4)_2\ MoO_4$], and this is again evaporated down, leaving what is assumed to be ammonium dimolybdate. I tried this two or three times, and dissolved the crystals in water, and treated carbon tissue with the solution, but in no cases did any image result, though a varied range of exposure was resorted to. In this again I assumed that my preparation was not dimolybdate, for I feel confident that it would act similarly to dichromate. I have tried to get the salt made for me at two or three London houses, but with no success however.

I might mention that the solution prepared from the second crop of crystals gradually turns blue on exposure to light; and it may therefore be taken for granted that it is not identically the same as the original lot. Possibly, if it had been wholly *di*-molybdate, it would have been much more sensitive. It also gives a very sparing precipitate with sodium phosphate.

There is an interesting difference in the behaviour of the chlorides of chromium and the three other metals. A solution of each applied to paper gives the following results. When sufficiently exposed (*i.e.*, when printed for such a time that on development with potassium ferricyanide, an image of sufficient depth is obtained), two of the salts are visibly changed, and the others are not. Thus uranium and tungsten chlorides after sufficient exposure give no visible, or at any rate appreciable, image, whilst the images with molybdenum and chromium chlorides are visible; and the molybdenum chloride image is so deep that it needs no development.

Uranium salts alone may be similarly classed, viz., those which give a visible image: the nitrate, ferricyanide, and acetate; those which give an invisible image: the chloride, phosphate, and bromide. (This list is obviously not inclusive.) The ferricyanide of uranium is worthy of notice, as with due care better results can be obtained with it than with the nitrate. Fairly strong solutions of potassium ferricyanide and uranium nitrate may be mixed, and shaken together, and the brown solution applied to paper with a brush before precipitation has had time to take place. The paper may be printed out to a good depth; treatment now with the ferricyanide bath has no more effect, and merely washing the prints in water suffices to render them permanent so far as I have had time to judge.

Uranium phosphate, if applied alone to paper, seems to be practically insensitive to light, but if the precipitate be dissolved in tartaric acid, it then becomes sensitive, though the image, as already stated, is not visible when ready for development.

The bromide of uranium perhaps gives the best results of any of its salts for printing purposes. A five per cent. solution may be applied to paper, and exposure under a negative of average density of from ten to fifteen minutes in direct sunlight given. Development is carried out with a two to three per cent. solution of potassium ferricyanide.

Prints made in any uranium salt may be intensified and reduced, the former not, however, being lasting in the way in which I have carried it out. Uranyl salts and uranic halides are soluble in a solution of an alkaline carbonate, and may by such a solution be reduced to any extent. The solution should be extremely weak, however, as the action is both fast and destructive to the image.

A uranium bromide print was intensified with mercuric chloride, being left in an acid solution of $HgCl_2$ till a slight bleaching action—or what appeared to be a bleaching action—had taken place. It was then washed and placed in weak ammonia. Momentary intensification was very distinct, but almost immediately the whole image dissolved.

For printing in molybdenum, I suggest the following method:—Take about one gramme of powdered molybdenum metal, and treat it with aqua regia, after having first made it into a thick paste with as little water as possible. After the action of the acid has ceased, the solution should be diluted to about 20 c. c., and filtered; one gramme of gelatine must now be allowed to soak in the filtrate for an hour, and the whole then heated on a water bath, with constant stirring, till most of the gelatinous mass at first formed is dissolved. The solution must then be repeatedly filtered through muslin, until quite clear. Either ordinary or baryta paper can be coated in the usual manner with the solution. Printing is done preferably in direct sunlight, and must be continued till the image has obtained the required depth, as it is difficult to intensify it in any way. All that needs to be done now is to "fix" the print (if so the operation may

be called), and a one per cent. solution of acetic acid may be used for this purpose. The colour of the print is not changed by this process. Potassium ferricyanide, gold chloride, tannic acid and ferrous sulphate do not appear to appreciably affect or change the colour of the image; cobalt ferricyanide imparts to it a grey-blue colour.

Before proceeding further, I should like to bring in the latent image for a moment's consideration. If a uranyl or uranic salt be reduced to a uranous compound, what happens when a uranous salt is reduced by light? The explanation given usually regarding the latent image in iron salts is that ferric compounds are reduced to ferrous on exposure to light. Ferrous phosphate, however, is also reduced by light, so that a sub-phosphate must be produced according to the sub-haloid theory. Similarly if a uranyl salt were reduced to a uranous salt, it should give a green image, or an image which at any rate contained green colour as well as the original colour of the sensitising salt. The actual colour of the image, however, appears to be rather that of some such substance as a "uranyl" sub-salt, so to speak, in which (UO_2) was still retained, and the haloid reduced, the oxygen being left unchanged. The formula might be written as $(UO_2)_n\ (NO_3)_{n-x}$, in the case of the nitrate, but not as $U(NO_3)_4$, or $U(NO_3)_2$.

Whatever happens, I should like to throw in my suggestion again concerning the connection between electricity and the formation of the image. The influence of light in some way lessens the affinity between the atoms of the salt, so that decomposition may be brought about. At the same time, if hydrolysis sets in, as has lately been put forward, it may be taken for granted that even in the exceedingly small quantity of water from which, say, silver chloride cannot be freed, ionisation takes place. Uranium ferricyanide, however, may be obtained dry much more easily than silver chloride, as it can be precipitated in a much finer condition, and does not crystallise in such comparatively large forms. A specimen of the compound was carefully dried, first, for several hours in a hot air oven at 38° C., and afterwards placed in a desiccator for several days. It was then put into a small bulb, and exposed to light, and was very visibly affected. Of course, it cannot be asserted with any confidence that this salt was chemically dry; for a specimen of silver chloride made under the same conditions was perfectly sensitive to light, whereas if chemically dry it should not have been, according to results that have lately been obtained.

As electricity can be so easily obtained from films under exposure to light, it seems essential that the light energy on absorption be converted into electricity, under whose influence the haloid can be reduced to sub-haloid, or turned into whatever substance it may be; and further, in such cases where the heat of formation of the reduced compound is negative, and the compound exothermic, the heat given out must be transformed into something, and the simplest way out of the difficulty, and the most obvious, is that it becomes electricity, which must be present at either ionisation or reduction.

The effect of light on uranium salts is of special interest, because the metal both alone and with oxygen forms sensitive compounds, and there are at least three distinct sets of salts which are decomposed by light, viz., the halogen compounds and uranyl and uranium compounds. The sensitiveness of the chlorides of the four metals, chromium, molybdenum, tungsten, and uranium, offers another confirmation of these metals' position in the periodic system, and might justly be classed with their capability of forming salts of the type $ROCl_2$. The difference in the images of the haloid salts, however, is at first somewhat disconcerting; and it is difficult to suggest a reason for the molybdic chloride image being practically unaffected by either potassium ferricyanide or mercuric nitrate as regards development (the picture almost disappearing in either case).

A point of interest in the comparison of the different salts is the exact reversal of arrangement with the chlorides and nitrates of molybdenum and uranium. The chloride of uranium gives an invisible image (that is, invisible in the way already mentioned), and the nitrate a visible image, whereas molybdic chloride gives a visible image, and that obtained with the nitrate is invisible. In either case, however, whether developed with ferricyanide or not, the molybdic images are blue, and this seems to indicate that the decomposition product is the blue oxide, MoO_2, and not a sub-haloid or sub-nitrate.

In order to try and find out something about the reduced or light-affected salts, I exposed dry uranium ferricyanide in an open bulb to sunlight for about a fortnight. A similarly prepared and dried, but unexposed, specimen was now taken, and .3 gramme placed in a crucible, and reduced by heat until the weight was constant. A diminution was then observed of .091 gramme, showing a loss of 30.33 per cent.

A quantity of the exposed compound weighing .08 gramme was next heated and reduced to .051 gramme, showing a total reduction of 36.25 per cent., there being therefore a further reduction in this case of 5.92 per cent. If the action of light had performed part of the reduction, and the reduction product, if volatile, had been removed, one would have looked for a less reduction when heat was applied. The experiment, however, shows just the reverse, and seems to complicate matters very much. It must be admitted that there was room for considerable inaccuracy in the experiment, as it was extremely difficult to prevent some of the compound leaving the crucible during the heating.

I had hoped to find whether any difference existed in the rise of boiling points, but could find no solvent for that particular substance. I am at present, however, experimenting with the soluble salts, and intend to apply depression of freezing-point and rise of boiling-point methods to the reduced and normal salts in solution.

As regards the practical value of these compounds, it is difficult to gauge them with fairness before more is known about developing agents suitable for the molybdenum salts. Paper coated with molybdic chloride takes about an hour to print, if a five per cent. be used for sensitising, but at the same time no ill effect is apparent if the exposure be very largely increased. Also if a faint image be obtained, and this developed with potassium ferricyanide—in very weak solution—and taken out of the solution after a few seconds, being then quickly washed, a fairly dark image results, but it is not at all satisfactory as compared with the deeply printed and untouched image.

Molybdenum chloride has a similar effect on gelatine as uranium salts, but it is not so pronounced. When a uranium salt is added to gelatine in solution it forms a precipitate with it, which is only slightly soluble in water at 100° C.

With molybdic chloride, however, boiling the solution for a few minutes is sufficient to dissolve the greater part of the thick gelatinous mass first formed, and the solution, after being strained through two or three thicknesses of muslin, can be applied to paper. I have coated ordinary paper and baryta paper with this solution, and both give very fair results. For in this case we have a very much thicker film on the paper, of course, and we can hence produce a paper which will print very much faster, and at the same time give considerably more detail.

The chloride, similarly to uranium nitrate, may be mixed with collodion, and applied to paper with a substratum in the ordinary manner.

It is noteworthy that a gelatine solution of molybdic chloride exhibits a slight fluorescence; and it is not at all unlikely that it, and the other molybdenum salts—and possibly those of tungsten also—possess radiating powers similar to those noticed by Becquerel in uranium salts.

The next metal to which I wish to draw your attention is tellurium. Tellurium occurs next to molybdenum in the sixth group in the ordinary classification of the elements, though it is, of course, more directly connected with selenium and sulphur. But it is also in the same "line" as silver, viz., in the second "long period."

The sensibility to light of its chloride is a very strong reason for classifying it with the metals, and adds an interesting item to the data already given for that purpose. Tellurium chloride gives an invisible image, which on development with potassium ferricyanide gives a blue colour, the blue having a slight tendency to green, however (this being the only distinction between it and a molybdenum image).

The chief value of tellurium will be, I think, its toning powers. The metal may be dissolved in a mixture of hydrochloric and nitric acids in the proportion of about three to one. This gives a yellow liquid, which becomes colourless on dilution with water.

The dilute acid solution imparts very beautiful brown and sepia tones to developed and fixed bromide prints, and seems to rather reduce the image than intensify it in any way. Whether the colours are permanent or not is doubtful, but there seems no reason for their not being permanent.

Molybdenum salts in conjunction with potassium ferricyanide and acetic or hydrochloric acid may also be used, the tones being much the same as those obtained with the well-known uranium baths.

All these properties seem to bind the family of elements very closely together, and it is interesting to find that the oxygen and sulphur portion of it have at least one representative which exhibits the sensitive properties of the sub-group.

T. Thorne Baker.

Our Editorial Table.

Imperial Plates for Small Cameras.

In order to meet the increasing demand for small plates, the Imperial Dry Plate Co., of Cricklewood, have recently modified their prices for small plates, which can now be obtained, coated with their usual rapidity emulsions, in the $2\frac{5}{16}\times1\frac{3}{4}$ in. or 4.5×6 cm., and $3\frac{1}{4}\times2$ in., or 6.5×9 cm. sizes. The Imperial P.O.P. is also now supplied in these sizes, and the Company will be pleased to send their price lists of these sizes to any applicant.

Writeit Bottles.

J. J. Griffin and Sons, Ltd., 20-26, Sardinia-street, London, W.C.

Although these bottles are not new, they have lately been much improved. They are provided with a plain white matt badge, on which

the name of any chemical can be written with lead pencil, which can be easily removed with a damp sponge, should the bottle be required for some other chemical or solution. The stopper provided with these bottles is a combination of the "grip" shape, which permits of its



easy removal, and it has also a flat head, which prevents dust from collecting on the lip, and, as this head is octagonal and not round, there is no danger of its rolling off the bench. They are made both with narrow and wide mouth, and will be found of great convenience, and a great advance over the ordinary type.

"Carbona" Outfits.

The above firm are introducing a special "Carbona" outfit, consisting of 10 pieces of quarter-plate matt paper and a packet of toning salts, which are sold at the nominal price of 4d., and this brings them within the reach of a far larger circle of users who can thus try the paper under the best conditions.

News and Notes.

The entry forms for the annual exhibition of the Hackney Photographic Society, which will be held from November 6 to 8, at the Morley Hall, Hackney, may be obtained on application to Mr. Walter Selfe, 70, Paragon-road, Hackney, N.E.

Mr. Edmund Wormald, one of the oldest photographers in the North of England, formerly in business in Great George-street, Leeds, died on Monday, aged 72. He was staying at the time with his daughter, Mrs. Emery, at The Chase, Pinner, Middlesex, on a visit. He has of late years been in greatly reduced circumstances.

A Tall Flash-Light.—We read in one of the dailies that, in taking a photograph of the 1200 men at work in a Chicago factory twenty pounds' weight of flash-light powder was fired. This must have been a pretty tall light, but there, they do big things in the States, you know.

Submarine Photograhy.—Naval-Surgeon Tessipoff, of the Runidi Baltic fleet, has been making some extraordinary experiments in submarine photography during the summer cruise. The results obtained have been satisfactory, although great natural obstacles had to be overcome. These experiments of Surgeon Tessipoff tend to show that with improved apparatus it will be possible to photograph anything in or at the bottom of the sea, regardless of depth.

According to the report of the British Consul at Madeira on the trade of the island, photographic plates and papers continue to be a British monopoly, but mounts, chemicals, and photographic accessories are largely imported from Germany. Cheap hand cameras—close imitations of well-known American patterns—are being imported and sold at reasonable prices, and are made to take English sizes of plates, and it is suggested that if British makers were to study this branch of trade a fair business could be done.

The dangers of celluloid were again demonstrated last week at Boulogne, when the summer fair, which attracts many English visitors, narrowly escaped destruction. A fire broke out in a stall near the top of the Boulevard Mariette, and rapidly extended until about sixty yards of stalls had been destroyed. The fire broke out in a booth for the sale of celluloid goods, but the cause has not yet been ascertained. Thirty-two stalls were destroyed, and the hawkers to whom they belonged have been plunged into the greatest distress. Several persons were injured in attempting to stop the progress of the flames. The damage done is very considerable, and is not covered by insurance. The municipal authorities at once proceeded to the scene and took immediate measures to meet the first needs of sufferers.

With regard to the article on Pseudoscopic Vision without a Pseudoscope, which we reprinted in our last issue, Mr. A. S. Davis, of Roundhay, Leeds, writes to "Nature," and says that the curious optical illusion which has been noticed by Professor R. W. Wood and described by him in "Nature" for August 8 under the heading of "A New Optical Illusion" has been known for many years. It is mentioned in Helmholtz's great work on physiological optics in the chapter on the stereoscope and pseudoscope. It appears to have been first described by Prof. Joseph Le Conte in 1869 (see Silliman's "American Journal of Science" for January, 1869, and "Phil. Mag.," February, 1869). Both these authorities mention a further similar illusion not described by Professor Wood, which he thinks is a more striking illusion. If one looks at a pattern of which the distance between the centres of contiguous figures is somewhat less than the distance between the two eyes, and if we gaze at it in such a manner as if we were looking at a distant object beyond it, we then get the illusion of a much increased pattern at a considerably greater distance from the eye.

The Becquerel Rays.—In 1895, a French chemist discovered rays emanating from the element uranium, which possessed properties similar to the Röntgen rays. They are called Becquerel rays, after their discoverer. But while the discovery of Röntgen aroused great interest in the whole civilised world, leading to radical changes in medical diagnosis, the Becquerel rays were only employed in a very limited way in physical laboratories. Recent experiments by the Berlin High School of Technology have proven that a new element, not uranium, is responsible for the Becquerel rays—and the interesting fast has been observed that these rays render almost every transparent substance luminous in the darkness. These rays make it possible to tell genuine diamonds from artificial ones in the dark. The experiments have also resulted in obtaining, for the first time, larger quantities of the new element, which has demonstrated that rays emanating from a larger quantity make the air such a conductor of electricity that it is hoped this property can be utilised in wireless telegraphy. Experiments for this purpose are being made in the Berlin institution, but the deepest secrecy is preserved.

M. Auer von Welsbach has found a method of making incandescent lamp filaments of osmium, and the new lamp presents decided advantages. The incandescent lamp is more economical the higher the temperature at which the filament burns, and as osmium is the metal which has the highest fusing point, it is found that it can be burned at a higher temperature than the carbon filament, with consequent economy of energy. Although osmium has usually been recognised as a pulverulent or spongy body, or again in its hard form, the inventor has succeeded in making filaments of it, and the new lamp is receiving considerable attention. It not only gives more light for a given consumption of energy, but its life is said to be greater than that of the carbon filament; the osmium lamp takes 1.5 Watts per candle-power, and lasts 600 hours, even reaching as high as 1100 in 1200 hours. When the bulb has become darkened on account of the deposit, it may be cleaned easily and cheaply without having to change the filament or bulb. On account of the lower electrical resistance of the osmium filament the lamps are burned at a lower voltage than for carbon filaments; they are made at present for tensions of 20 to 50 volts. On an alternating current system this voltage is easily obtained by the use of the proper transformers. Another advantage of his low voltage is found in its use with accumulators, as a less number of cells are required; on account of the diminished weight the system promises to be valuable for vehicle and railroad lighting. According to the experiments carried out by M. Scholz, the lamp has an economy of 60 per cent. over the present lamp. It is said that the lamp is already being made in capacities from 5 to 200 candle-power.

Dr. N. E. Dorsey treats on the colour of polarisation of blue skylight in an article in the "Monthly Weather Review." The subject has been considered of great interest for hundreds of years. Leonardo da Vinci considered that the blue of the skylight is due to the mixing of the white sunlight reflected from the upper layers of the air with the intense blackness of space. Sir Isaac Newton thought that the reflecting particles were small drops of water. This theory was at first generally accepted, but in 1847 Clausius subjected it to a strict mathematical analysis. He proved that the light of the sky cannot be due to the reflection of sunlight in small drops of water. Tyndall, in 1869, demonstrated that when the particles causing the turbidity are exceedingly fine, scattered light is not only a magnificent blue, but is polarised in the plane of scattering; the amount of polarisation is a maximum at an angle of 90 degrees with the incident light, and the definition seen through it is unimpaired by the turbidity. Lord Rayleigh undertook the analytical treatment of the subject, and proved quite recently that about a third of the total light from the sky may be accounted for by the scattering produced by the molecules of oxygen and nitrogen in the air entirely independent of the presence of dust, aqueous vapour, or other foreign matter. From these and other observations and investigations it is evident that the colour of the sky is independent of the angular distance of the point observed from the sun—being a function of only the state of the atmosphere and the thickness of the stratum observed. Careful observations on the colour of polarisation of the light from the sky, therefore, supply data determining the amount and size of the particles floating in the air, be they dust or water, and as any change in the state of the atmosphere will affect these quantities, such observations should be of ever-increasing importance to meteorology.

The Goldsmiths' Institute Camera Club, which meets at the Institute, New Cross, possesses a well-lit and convenient club-room, open to members during Institute hours (10 a.m. to 10 p.m.), supplied with various photographic books of reference, which can be borrowed, if desired, by arrangement with the Secretaries; also an excellent dark room communicating therewith, capable of accommodating a number of members working at the same time. Washers, racks, measures, developing dishes, &c., of various sizes are provided. There is an enlarging lantern (Optimus, 8 in. condenser) for the use of members free of charge, and an optical projection lantern has just been purchased. The incandescent burners in both rooms are fitted with bye-passes, and are therefore most convenient for bromide printing, lantern slides, velox, &c., while each member is entitled to a private locker. Varied and interesting lectures and practical demonstrations are given at frequent intervals during the winter session (October-April). "Lantern Evenings" are held, and mem-

bers meet in the Institute on specified evenings for the interchange of ideas, mutual criticism, and to hear short papers on current photographic topics. These lectures and meetings should be especially helpful to beginners, who will have the benefit of the experience and advice of older workers. Photographic competitions (developing printing, &c.) are arranged, prizes being awarded. An exhibition of members' work, lantern slides, and apparatus takes place annually, while in summer months photographic rambles are organized. A portfolio for prints is circulated amongst the members, and queries on any photographic subject addressed to the Secretaries will be replied to by them in the "Camera Club" column of the Institute "Journal." The subscription is half a crown (2s. 6d.) per annum. Applications and inquiries should be addressed to the Joint Hon. Secretaries at the Institute, special attention being given to the interests of lady members by the Ladies' Secretary.

M. Demarcay, in the course of his spectrum analysis work, claims to have discovered a new element, to which he proposes to give the name of europium. In the account which he has lately presented to the Académie des Sciences, M. Demarcay brings out the following points. Sir Wm. Crookes, while pursuing his vacuum tube researches, observed in 1885 a band which he attributed to samarium, and which on account of its disappearance in the presence of lime, and other peculiarities, he called the anomalous ray. Later on he distinguished it, together with a great number of other bands, each of which appeared to characterise a special meta-element. He called S δ the hypothetical meta-element which corresponded to the anomalous ray. In 1892 De Boisbaudran described a series of three brilliant blue lines, which he discovered in the spectrum of the samarium spark. These lines could be brought out more strongly by a fractional treatment of the material, and he concluded that they were due to a special element, which he called Z ζ. In 1896 M. Demarcay announced the presence of an element intermediate between gadolinium and samarium, which was characterised by several strong violet and ultra-violet rays. He also showed that the new element was identical with that of De Boisbaudran, and no doubt accounted for the anomalous band of Crookes, as well as other rays not yet described. At that period M. Demarcay could not obtain enough of the material to make further experiments, but at present he has accumulated a larger quantity of it by a fractional treatment of nitrate of magnesium, and finds that its characteristics, namely, line and absorption spectra, electric fluorescence of the sulphate in vacuo, &c., accompany it constantly, and are proportional, thus evidently belonging to one and the same element. The purity of the few grammes of the new oxide obtained was sufficiently great to exclude all the samarium rays, and only the stronger gadolinium rays were visible in the electric spectrum. If the product was added in traces to sulphate of calcium, it gave a brilliant spectrum of fluorescence in which the anomalous ray predominated. This spectrum includes three principal bands, $\lambda = 609$, very strong; $\lambda = 576$, considerable and wide; $\lambda = 593$, strong and very wide (the figures are approximate). The degree of calcination of the sulphate caused variations in the bands; the strongest seems to change to a double ray when the calcination is strong. The author proposes the name europium for the new element, with the symbol eu=151 (about). He then gives a list of forty of the principal rays of its spectrum comprised between $\lambda = 500$ and $\lambda = 350$; the strongest of these are as follows:—$\lambda = 4662.6$; 4627.8; 4594.5, 4435.8, 4205.4, 4130.0, 3972.0, 3930.7, 3819.5, &c. In this spectrum the samarium rays were entirely absent, and the strongest gadolinium rays were scarcely visible. Besides the rays given, which no doubt belong to europium, a great number of feeble rays are seen, which may belong to this element, or perhaps to an unknown element even more rare; this the author proposes to study later.—"Scientific American."

Commercial & Legal Intelligence.

Re William Charles Bax, photographer, of Rubgy and Lutterworth.—The first meeting of the creditors concerned under this failure took place at the offices of the Official Receiver, Coventry, on Thursday last week. The statement of affairs filed by the debtor disclosed gross liabilities amounting to £242 14s. 5d., and the deficiency was returned at £155 17s. 8d. Replying to questions, debtor said his Lutterworth branch had not been managed profitably, whereas when he looked after it himself it was very profitable. When he filed his petition the Rugby landlord took possession of the premises, locked debtor in the house, and put up a notice, "The business on these premises belongs to the landlord." The Official Receiver said he had received some telegrams to turn out of possession.—After further discussion, it was decided to leave the estate in the hands of the Official Receiver for summary administration in the usual manner.

Henry Archibald Spencer, a photographer, of Clapham Junction, was charged on remand at the Greenwich Police Court on Thursday, last week, with obtaining money by means of false pretences. Thomas Wm. Orton, of Albert-road, Silvertown, said that in August of last year he paid the prisoner 3s. in connection with the enlargement of two photographs. He called upon prisoner twenty-one times for the enlargements, but never received them. Witness knew him as trading under the name of the London Anglo-American Photo Company. The prisoner denied that he obtained the money by fraud, and said he fully intended to carry out the order. James Brooks, of Camberwell-road, said the prisoner took a photo of his shop, for which witness paid 6s. 6d. He heard nothing further of prisoner or the photographs. Prisoner said that in this case a very good photo was taken, and he could produce the negative. Witness said he wrote to prisoner, but received no reply. In another case prisoner gave as the reason for not sending on the photo that he had an accident with the negative. Mr. Lewis, who appeared for the prosecution, in reply to the magistrate, said there were 148 complaints against the prisoner, and 12 actual charges of obtaining money by means of false pretences. Detective-sergeant Nursey said that when he arrested prisoner at Clapham he replied "I have been expecting this. I admit I have been very negligent in conducting my business. The negatives got mixed up, and when the customers applied I did not know which was which. I had no intention to defraud. If I had had the money I should have executed the work." The prisoner had an incomplete set of photographic apparatus at his shop. The accused went into the witness-box, and, in the course of a long statement, said he had never obtained one halfpenny by fraud and had no dishonest intention whatever.—The Magistrate said the prisoner's defence was plausible, but he had carried on a fraudulent business, and had cheated a large number of people. He would be sentenced to six months' imprisonment with hard labour.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
2.....	Bradford Photo. Society	Jumble Sale.
2.....	South London	*Home-made Apparatus.* J. T. French.
2.....	Walthamstow Photo.....	Ordinary Meeting.
3.....	Gospel Oak	*Oxygen Gas and its connection with Photography.* J. E. Rayner.
5.....	Hull	Monthly Meeting.
7.....	Birmingham Photo. Society ...	Excursion: Baddesley Clinton, Hayes Wood, and Rowington. Leader, the Hon. Secretary.
7.....	Borough Polytechnic.....	Excursion: Chislehurst. Leader, Geo. Fisher.
7.....	Hull	Excursion: Paull.
7.....	South London	Excursion: Dartford. Leader, Alex Fellows.
7.....	South Manchester	Excursion: Prestbury. Leader, E. J. Brooks.
7.....	Walthamstow Photo.....	Excursion: The "Roding" at Chigwell.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Meeting, August 22,—Mr. T. E. Freshwater in the chair.

Mr. A. L. Henderson showed some varnished negatives he had made some ten or twelve years ago. Having had occasion to look over these negatives, he found a great many were covered with small ruby coloured spots, which were apparently under the varnish. Mr. Henderson, as far as he could remember, had not printed from these negatives before varnishing, so did not think the cause could be free silver coming in contact with the gelatine, but thought rather that the varnish he had used at the time (a white hard spirit varnish) must have been impure, or else the plates had not been thoroughly fixed in the first place; but what led to his belief that the varnish was the cause, was the fact that where the varnish had gone in ridges at the edges of the plate, here the spots were thickest. By removing the varnish and giving a good long soak in water, and then treating with ferricyanide and hypo, he had removed them to some extent. Re waxing on the top of varnish as a further preventative from silver stains, Mr. Henderson produced some beeswax, and showed how to apply it by rubbing a little over the varnish and warming the plate over a gas-jet, and polishing off with a soft cloth. Care must, however, be taken to polish very thoroughly, or else the wax will show finger markings.

Mr. Freshwater passed round some very interesting photographs he had recently made in and around Harlech.

Mr. Hodges passed round a print on the Paget's self-toning paper, showing what a very warm tone could be obtained.

Mr. Welford, in speaking of this paper, said he had made a print in direct sunlight, and another from the same negative in the shade; fixed one in the normal strength of hypo, and the other in four times the strength, the resulting tones being exactly alike. Results like this, Mr. Welford was sure, could not be obtained on any other paper.

Re the Ortol-stained negatives Mr. Henderson had showed some time ago, Mr. Grant said he had had a precisely similar negative to deal with, and had been experimenting in order to remove this stain. He had cut a strip from the negative, and dipped it half-way in a 10 per cent. solution of hydrochloric acid. While in the acid the dye was gradually discharged, but when put up to dry the stain gradually reappeared.

This, Mr. Henderson said, was due to atmospheric influences.

Mr. Rapson said he had been trying to get this stain, and had saturated a negative in ortol for three weeks, but without success.

A discussion then followed on the developing powers of ortol when oxidised or discoloured solutions were used.

Mr. Teape had used a solution which was black, and had developed a portrait negative, the image being fully developed in about five minutes, giving a blue-black deposit without the slightest stain.

On the other hand, Mr. Mackie had used a solution which was a year old, and development took about one and a half hours.

Mr. Rapson said he had noticed in his experience with ortol that, when it becomes discoloured, it also gets very much slower.

In some remarks on density varying in different makes of plates, Mr. Henderson said he had been given some lantern plates to try, and, although these plates had a good thick emulsion and possessed a fine grain, he could not get density on them, having tried all sorts of exposures and reduced the image right through to the glass.

Mr. Grant inquired whether it was possible, after seeing the image appear through to the back of the glass, to reduce still further?

Mr. Henderson said that if one continue development after this stage it would flatten the image and destroy the scale of gradation in the half-tones.

Conversation then turned on the action of meta-bisulphite of potass as a preservative and its slowing properties if used in excess.

North Middlesex Photographic Society.—Technical Meeting.—In a discussion on "mountants," Mr. Mummery said care must be taken to mount mercury-toned prints with starch-paste only, as with some of the mounting pastes sold ready for use, the colour was discharged in a very short time. Various methods of mounting without cockling were mentioned. Keeping the print as dry as possible by quickly covering the back with starch or other paste as thick as possible, consistent with even spreading, and laying on mount in position and drying under blotting-paper and a weight, or in a press.

Patent News.

THE following applications for Patents were made between August 12 and August 17, 1901:—

PRINT TRIMMER.—No. 16,157. "A New or Improved Instrument or Device for trimming Photographs, Prints, and the like." TIMOTHY JOHN HEAD.

A VIEW FINDER.—No. 16,218. "A View Finder for Panoramic and other Cameras, and for indicating the length of film needed to obtain the view selected." ARMAND JOHN THOMAS LE GROS.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

LESSONS IN SPANISH.

To the EDITORS.

GENTLEMEN,—The Spanish Chamber of Commerce in London is establishing classes for the study of the Spanish language, which are to commence in September next.

These classes will be conducted by competent native teachers, and are intended to assist those who are engaged in commercial houses in London where a knowledge of the Spanish language is required.

The fees will be very moderate.

This development of the work of the Spanish Chamber of Commerce will, undoubtedly, be of sufficient public interest to warrant our asking your aid to enable us to make known the formation of these classes.

Full particulars may be obtained by personal or written application to the Secretary.—I am, yours, &c.,

MANUEL R. AMERIGO, Secretary.

20, Mark-lane, London, E.C.

THE USE OF BACKED PLATES.

To the EDITORS.

GENTLEMEN,—Considerable difference of opinion exists as to the advantages of making general use of backed plates. Some authorities assert that the results are distinctly superior; while, on the other hand, it has been said that there is no particular advantage in making use of a backed plate, except for special purposes. It can be fairly asserted that comparatively few workers make a practice of using backed plates for general purposes, although, no doubt, many workers would do so if it could be shown that the results were superior. There are, of course, many occasions when the use of a backed plate is essential. Whether it is any advantage to back one's own plates is rather doubtful. The saving would be slight, and you are not at all likely to cover the plate so evenly as a plate bought ready backed. Should backed plates be used in magazines and changing boxes? So far, the writer has hesitated to use backed plates in a changing box. When cycling with the camera, as it is, it is not easy to avoid the grinding action which goes on in the dark slides when glass plates are used. Under these circumstances it would probably be correct to assume that if backed plates were used in a magazine or a changing box—in which case the surface of the plates would naturally come in contact with the backing—the sensitive surface would be affected, and a fine crop of pinholes would be produced.

A good deal has been written as to whether backing slows a plate. If backing does affect the speed of a plate, the difference, in many cases, would be almost imperceptible. As far as the writer is aware, no special speed numbers have been issued by the exposure-meter makers in respect of backed plates. Indian ink forms a convenient backing for many purposes.—I am, yours, &c.,

J. A. R.

A WARNING.

To the EDITORS.

GENTLEMEN,—A few days ago an American called on us offering for a fee to explain a process for transferring photographs on watches, &c., and, by payment of such fee, we had an understanding in writing that we should be the only ones to use it in the town. It appears he called on all the others, endeavouring to obtain a fee, and, it may be, giving the same promise, but was only successful in one other case. But you will agree with us that this should be stopped, so that if you can find room in your valuable paper it will be a warning for photographers in other towns to be on their guard.—We are, yours, &c.,

WATCH.

METRIC WEIGHTS AND MEASURES.

To the EDITORS.

GENTLEMEN,—Although a most ardent advocate of the metric system myself I cannot think that Mr. Sutton's dissertation thereon will tend to enamour the general public of the same. The multiplicity of figures he gives, and the awkward transpositions are quite sufficient to cause the inquirer to ask, "Cui bono?" In fact, I hardly think he can have had much practical acquaintance with it, or he would never give such an impossible formula as: Gold chloride, 64.8 mgms., and water, 227.16 c. c.

In France I have made for trade purposes many thousand gallons of solutions of all formulæ, and with the greatest ease; but on returning to England I fear I have given the Recording Angel a lot of extra work. The great merits of the metric system are that (1) in no matter what bulk the formula is to be put up, the proportions of the various parts are all plainly recognisable at a glance, and also, their proportions to any other formula. (2) One can double, quadruple, or increase in any proportion, without any calculation. (3) That formulæ are always expressed in quantities of the same bulk. I have before me, for instance, one maker's directions, and the following are the bulks: 7½ oz., 7 oz., 80 oz., 12 oz., 20 oz., 10 oz.; and another maker will probably quote 16 oz. These quantities necessitate either different-sized bottles for each, bottles too large, which is not at all desirable, or, as in the case of 12 oz., 2 oz. of mixture left over to waste after filling a 10 oz. bottle.

On another paper I find 600 grains, 800 grains, and 1000 grains. Suppose I wish to treble these amounts, or even weigh them as they are? Commence weighing 600 grains. First, 1 oz., 437½ grains (Ye gods!). Then ½ oz.; let us see, 218¾ grains (Oh, ye gods, ye gods!!), which makes—where's a pencil? Sirs, nothing but stern necessity keeps me in a country which retains as a standard measure a weight one of the aliquot parts of which is 437½. Words cannot be found in which to describe, fitly, such a state of things.

Your contributor unnecessarily involves matters by quoting weights that are not in practical use at all. The only ones in general use are the litre (fluid), the kilo (solid), both for practical purposes 1000 grammes each; and the gramme. For domestic purposes another weight, the hecto (100 grammes) is sometimes used in purchasing butter, sugar, &c., but a man who asked for a hecto of hydroquinone would be regarded with the same look of astonishment as would one who asked for ten scruples of sugar.

For chemical purposes all is quoted in grammes: you have gramme weights from 1 to 1000, in multiples, and any weight can be measured up in a few seconds. Fluids are quoted in one standard volume, the litre, half litre, or quarter litre, for which bottles are made. Our Continental neighbours have more sense than some of the dolts this side, who give us a formula for 12 oz.—a quantity which is like the word "fail," there is no such thing. A pint is 20 oz., ½ pint 10 oz., and such are standard measures for which we have bottles: and we do not want 2 oz. over rapidly turning brown at the bottom of another bottle.

I am sure that if photographers would only purchase a set of gramme weights and a ½-litre measure, and put away entirely that silly fuss about English equivalents, such as 64.8 mgms. of gold (I do not believe a Frenchman would understand what this is), and 227.16 c. c. of water (only a measure from out of a museum would do this), they would shortly wonder how on earth they ever consented to wallow in such a sea of absurdities, incongruities, and impossibilities, as our so-called system of weights and measures, under which, if you mislay your ¼ oz. weight, you will find it impossible to make up the exact amount with any other weights usually at your command.—I am, yours, &c.,

S. E. PARKER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. Clare, 22, Station-road, Port Talbot, Glam. *Photograph of three ladies at tea.*

J. Jarrett, High-street, Keynsham, Som. *Photograph of Colonel Llewellyn, J. C. Hurle, and Dr. and Mrs. B. B. Fox.*

T. R. Hammond, 1, Rose Hill-street, Conway, N. Wales. *Two photographs of the Countess of Dundonald and Lord Cochrane in a motor.*

BLACK.—You will find what you want by examination of our advertisement pages. It is against our rule to recommend particular firms.

GLASS POSITIVE.—H. WATSON.— The silvery appearance, seen from the glass side of the picture, is due to the glass being imperfectly cleaned before the collodion was applied.

UNDER-EXPOSED FILMS.—"PYRO" asks: "Will you kindly inform me the cause of failure to get anything like a decent image on the enclosed films?"—In reply: The cause is that the films are very much under-exposed, and become fogged in the forced development. The films have been returned, as desired.

A WEEK ON TRIAL.—"OPERATOR."—As you agreed to go a week on trial, with your travelling fare paid, although it was to be an engagement for a year if you suited, we do not see that you are entitled to have your return fare paid unless that was agreed for, or anything more than the wages for the week. It is evident your work did not suit, and there was an end of the matter. It would be useless for you to go to the County Court, as you would only waste your time and money.

SHABBY TREATMENT.—J. says: "I notice an answer to a correspondent (W. H. B.) last week, and I may say I have had a somewhat similar experience, but I do not know whether from the same house or not. I feel inclined to follow the advice you gave to W. H. B., and sue for the sum I agreed to supply the photographs for."—In reply: We should certainly advise you to do so. We should like to know the name of the firm, as well as that referred to by our correspondent last week.

H. M. C. writes: "Would it not be possible to utilise ordinary gas for taking portraits, copying, &c., at night?"—In reply: The idea of utilising gas for portraiture is by no means new, dating back even to the old collodion days. The most successful results are to be obtained by using the incandescent gas system, but, numerous have been the attempts, we do not know of any instalment now in existence. For copying, particularly pictures or coloured objects, gaslight is extremely useful, with isochromatic plates. It also does away with the necessity for a yellow screen, as a rule.

WORK ON PHOTOGRAPHY.—C. J. THORNE says: "Will you kindly oblige me with name of publisher of what you consider the best book on "Photographic Terms," and I shall esteem it a great favour?" In reply: We do not quite understand what you mean by a book on "Photographic Terms." Probably the "Dictionary of Photography," by E. J. Wall, is the kind of work you require. It is published at 7s. 6d., and may be had through any photographic dealer. A list of the principal text-books on photography is given on pages 662 and 663 of the ALMANAC. We do not undertake to answer correspondents through the post.

PENNY-IN-THE-SLOT MACHINES.—J. S. B. says: "Thanks for your reply in last week's JOURNAL in reference to guncotton, &c., but I wanted to know the address of some firm or firms who make all kinds of penny-in-the-slot machines, not merely photo machines. Would you kindly give the addresses of same if you know of any, as I fail to find any advertised?"—In reply: Your query now has nothing to do with photography, and we do not know the addresses of makers of penny-in-the-slot machines for other purposes. Possibly if you apply to some of the companies who have these machines at the different railway stations you will obtain the desired information.

FLAT CARBON PRINTS.—T. CROSS writes: "Can you please tell me how to get more vigour in my carbon prints, they are all so flat and poor? I sensitise the tissue in 1 ounce of bichromate of potash to 20 ounces of water, with three minutes' immersion, and do not squeegee off, so as to get as much bichromate in the film as possible. Lately I have used an ounce and a quarter of the bichromate, and still I cannot get vigour."—In reply: Our correspondent is working in precisely the wrong direction to get increased contrast in his prints. Instead of employing a strong solution, with that object in view, he should use a weak one. Let him try half an ounce of the bichromate to the pint of water, with a couple of minutes, or less, immersion, and he will get greater contrasts. A strong sensitising bath conduces to softness, and a weak one to vigour.

SENSITISING CARDS.—G. JOHNS says: "I should esteem it a favour if you would kindly inform me of a method of sensitising the centre of a design with a blank oval centre?"—In reply: Messrs. Marion and Co., Soho-square, supply a solution—"Panak"—that will answer the purpose very well. It is simply brushed on the cards.

DISCOLOURED PRINT.—"PUZZLED" says: "Would you kindly state the cause of the pink tint on the enclosed albumen print? It was made on ————'s ready sensitised paper, and you will note by the extra piece enclosed that it is perfectly white, but shortly after it is immersed in the first washing water (distilled) the back turns a deep pink colour. I have tried washing in ordinary tap water, and also water with a little carbonate of soda added, but still get the same result."—In reply: The discoloration is due to the print having been washed in too strong a light, and hence it became tinted. This paper is very sensitive, and should be manipulated in a feeble light.

DISTILLED WATER—P.O.P.—W. H. COX writes: "(1) Will you kindly reply through the JOURNAL telling me the cause and prevention of a growth in nearly every bottle of distilled water that it is my intention to use for 'toning,' after it has stood for a few days? (2) Also please give me a good formula for P.O.P., which you feel that you can recommend from experience?"—In reply: (1) If the distilled water is pure, and the bottles are kept well corked, there should be no growth in it. We suspect the water you have is not pure. (2) On page 1059 of the ALMANAC there is a formula for gelatino-chloride emulsion which is very good. Of course, those who make the commercial P.O.P.'s do not publish the formulæ by which their papers are made.

GROUND LANDLORD'S RIGHTS.—"IN A FIX" writes: "I have taken a house here (a private one) on a seven, fourteen, or twenty-one years' lease, with permission from the owner to put up a studio at the back for photographic purposes, which I have commenced building. I am now served with a notice from the ground landlord to pull it down, as the terms upon which the original lease was granted to my landlord prohibits any business being carried on, or any fresh erection being put upon the premises. Can I be compelled to pull the studio down, and be prevened from carrying on a business in the house? If so, can I get any recompense from the landlord?"—In reply: It seems that your landlord has granted you a lease under conditions that he was not entitled to do, and, therefore, he is liable to damages for the loss you have sustained, and you are entitled to have the lease cancelled. Your better plan will be to put the matter in the hands of a solicitor, who will perhaps be able to arrange a satisfactory settlement.

COMPENSATION FOR BROKEN NEGATIVE.—"QUERO" writes: "I lately sent a negative to a firm near London to have enlargement, &c., made from it. They wrote me saying the negative got cracked while in their possession, but they would vignette the prints, and thus obviate any difficulty. Then they wrote saying it did not vignette, and they 'worked out' the crack. They promised to send me a rough print, but did not fulfil their promise. The negative, which was a specially good one and valuable, was returned to me, but is now quite useless, and I wrote claiming —— to cover its value. They reply that in their price lists they state 'we cannot be held responsible for any damage that takes place, while in our possession, of customers' negatives.' Kindly let me know if, in point of law, they are bound to refund me, even although they make such condition."—In reply: The condition quoted is almost universal throughout the trade, and is well known. Therefore customers, when entrusting their negatives, comply with it, and take the risk. We do not see, in face of what is printed on all price lists, that you have any legal remedy.

ENCROACHMENT ON PREMISES.—Y. W. writes: "Your advice on the following will greatly oblige me. A, the owner, has let house, shop, and garden to B, and B has sublet house and garden to me. I have been here fourteen months, and commenced a photographer's business, and built a new studio at the back joining the house. A, the owner, lives next door, and keeps horses and traps to hire out. Since my being here A has erected a large shed to keep his traps, all on my ground, and using the back entrance, which they did when we came here, and before, and now is continually using some of the spare ground to run his traps on occasionally. The fence which divides us has been taken down by them, and there is no back-door for us. I have told A about using the ground, &c., and about the fence, and he laughed, and said he would do as he liked with it. I have told them to keep their traps off, but they don't take any notice, and I asked for allowance for using the ground, and the answer was A will give B notice to raise the rent on purpose to get me out, so that they can take in what garden they like after I am out. I have said to B that I wouldn't pay any more rent till something was done, as I have paid 9 months' rent. Can I claim compensation if I have to leave my business and turn out? Kindly give me your best advice what to do as I am only a young beginner in business."—In reply: It seems to us that as B has let the premises to you you can prevent A trespassing upon them, but much may depend upon the terms upon which they were let to you. We presume you have a lease of the premises; if so, read the terms of it. The best advice we can give is that you consult a solicitor and place all the facts before him.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Diverse Experiences. It is curious to note how one worker will succeed with a certain process, or a certain material, while another working under, apparently, precisely the same conditions will meet with nothing but failure. It ever was so in photography, and, possibly, ever will be. At a recent meeting of the London and Provincial Photographic Association there was a discussion re an ortol-developed negative, which was stained and shown by a member at a previous meeting. One of the members said he had been trying to get a similar stain, and had saturated a negative in ortol for three weeks without success. Another member said that with this developer, which was quite black, he had developed a negative in about five minutes, while another said that he had used a similar developer a year old, but the development took an hour and a half. With such facts as these before us we are not altogether surprised at finding at times a difficulty in answering correspondents who meet with experiences totally at variance with our own, and that of the majority of workers.

Risks in Photographing. Last week "Cosmos" narrated how some friends of his had taken photographs from most dangerous standpoints, and the risks they had run to obtain the desired points of sight. In the daily press of last week we read that a medical student of Hertford Colledge, Oxford, lost his life off St. David's Head. He had gone out to photograph waves breaking over the head, when he either fell, or was washed, off the rocks and carried out to sea, the accident being witnessed by a sister and cousin, who could render no assistance. Enthusiastic photographers at times expose themselves, as "Cosmos" pointed out, to great risks, without actually being aware of the fact at the time. We must ourselves confess that more than once we have placed ourselves in great peril when we were anxious to get the best point of view, clambering from rock to rock with the camera, or getting nearer and nearer to the brink of a dangerous precipice, and have not recognised the danger we had been in until we attempted to return. The fate of the young Oxford student last week should serve as a warning to the many amateur photographers who are now taking their holidays, not to expose themselves to dangerous risks in order to get a picture, however good it may prove. By the way, photographers are not the only ones on pleasure bent who run dangerous risks. Alpine climbers, for example. We read that up to the present time something like sixty fatal accidents have occurred this season to Alpine climbers.

* * *

An Unsuspected Copyright. It has hitherto been assumed that there is no copyright in the Ordnance Survey maps, and publishers of guide-books and other works with maps have up to the present made free use of the Ordnance maps without let or hindrance, so far as we are aware. The case, however, will be different in the future. The "London Gazette" last week contains a notice warning printers and publishers against making use of Ordnance Survey maps in such a manner as to infringe the copyright therein. They are also warned against the use, upon or in connection with any map—not being an Ordnance map—of any words or description which would imply that such map is produced by, or under the authority of, or in connection with, the Ordnance Survey Department. We presume, however, that use may still be made of the maps under certain conditions, inasmuch as the notice contains the following:—"Any person desiring to utilise in the production of a map the information obtained by the Ordnance Survey Department, and published in Ordnance Survey maps, should apply to the Controller of His Majesty's Stationery Office for permission to do so." This does not look like total prohibition. However, the notice in the "Gazette" winds up with the following:—"The Controller will take such proceedings as he may be advised, in the case of any map constituting an infringement of the said copyright and published without such permission, for the enforcement of the copyright; and in the case of any improper use of such words or description as aforesaid, for the protection of the exclusive right to use the words 'Ordnance Survey' upon or in connection with maps." The Ordnance Survey maps, it is true, cost a great deal to get up, but we should surmise that the copies of them that hitherto have been allowed to be published in guide and hand-books have not materially influenced their sale, seeing that they are sold by the Department at so low a price, and in so many different scales. It may perhaps not be known to some of our readers that the Ordnance maps are produced entirely by photography and photo-mechanical means. The maps are first drawn to a large scale, and then reduced to the different smaller scales in the camera. Photo-litho transfers on bichromated gelatine paper are then made from the negatives and transferred to zinc plates, and printed after the manner of lithography, the zinc plate taking the place of the stone. In the Indian Survey Office the maps are produced in the same way, but there the impressions are printed from stone instead of zinc. The great advantage of the latter over the former is the greater portability and the less room it requires for storage—no unimportant matter when thousands of stones or plates have to be dealt with.

* * *

How Drugs are sometimes Supplied. One of the London Coroners recently held an inquiry at the Newington Coroner's Court, respecting the death of Violet May Luck, aged 12 months, the daughter of Henry John Luck, a printer, living at 53, Pollock-road, Walworth.—Mary Hannah Luck, the mother, said in the latter part of last week deceased suffered from diarrhœa and vomiting. On Saturday she took the child to a doctor, who ordered milk, a little whisky, and lime water. Witness sent her young niece to Day's Drug Stores for the lime water, and gave deceased the medicine as prescribed by the doctor.—The Coroner: Of course you thought you had been supplied with lime water at the chemist's?—Witness: Yes, until the following morning, when my mother came in and said she did not like the smell of it. I gave her no more till the doctor called, and he said that, instead of lime water, I had been given methylated spirit.—The Coroner: How much did you get?—Witness: I sent for twopennyworth, and the bottle I sent bore an old label, "Lime water." This had not been altered, so I thought it was all right. The child expired about 9 o'clock on Monday morning.—Ernest Albert Hodson, a chemist, and manager of Day's Metropolitan Drug Company, Ltd., 301, Walworth-road, said that methylated spirits was supplied in mistake for lime water.—The Coroner: Who filled the bottle? Witness: The boy.—How old is he? Fifteen.—Where was the spirit kept? In a room at the back of the shop in a tin can; the lime water was also kept in the same room, but in a bottle on the shelf.—Is this boy in the habit of dispensing? No, he is casually called when we are busy to "put up" bottles.—Does he make up prescriptions? No.—You told the boy to put lime water in the bottle? Yes.—How came he to make the mistake? I do not know.—What are the boy's duties? General work in the shop, such as cleaning up and packing and unpacking goods.—And clean the windows, I suppose? How long has he been with you? Two months.—Have you had any mistakes before? No.—How many assistants were there in the shop when this happened? Two; the third one was at tea. There was a bit of a rush in business at the time.—Mr. W. H. Warburton, who watched the case for the company, said that he admitted the firm had made a mistake, and they very much regretted it, but he thought this was a very different case to a mistake being made in making up a prescription.—The Coroner: I fail to see it; the sequence is just the same.—

Herbert George Fardell, the shop boy, stated that he filled the bottle, as he thought, with lime water.—Dr. J. Hutchisson stated that the mother spoke about the "funny smell" of the lime water. He picked up the bottle and at once discovered that it was methylated spirit.—The Coroner: How much had the child taken?—Witness: Six teaspoonfuls. Witness had subsequently made a post-mortem examination of the body, and found the stomach much inflamed, the usual signs of an irritant.—The Coroner, summing up, said that if a person went to a chemist for lime water and was given methylated spirit, it was nearly as bad as being given carbolic acid. The same amount of care ought to be taken in selling it as the most deadly poisons. Boys ought not to be allowed to have anything to do with them.—The jury returned a verdict of "Death from misadventure," and added a rider that in their opinion there was great carelessness on the chemist's part. He ought to have seen that the proper drug was supplied to the customer, and the press of business was no excuse at all.—It is worth while recalling the fact that some little time back a company of druggists had to pay heavy damages for injury caused by bichromate of potash having been sold at one of its branches in mistake for the bicarbonate of potash.

* * *

The British Association. The next session of this body, which, as our readers are aware, will shortly meet in Glasgow, will have exceptional opportunities for variety of mental fare, with such valuable contributions to science as are always read at the meetings on the one hand, and the attractions of the Exhibition on the other. The Glasgow citizens, a few years ago, ran a photographic show with a big surplus at the end, and their present international show gives every promise of ending in a like satisfactory manner. Any photographers going to the Exhibition would do well to time their visit for the British Association week, for there seems promise of papers that will have much practical interest for the scientific photographer. We note that in Section A, for example, that subject which has had a revolutionary bearing on the manufacture of photographic lenses—we refer to the Jena glasses—promises to be very well treated, for arrangements have been made for discussions upon optical glass. With that intent, a paper will be read by Dr. R. T. Glazebrook. Then, again, a paper will be read on resolving power in the microscope and telescope by Prof. J. D. Everett, F.R.S., in which, we do not doubt, matters of interest in photo-micrography will be found. Dr. G. J. Stoney, F.R.S., will read a paper on the interference of light from different sources; while Professor H. H. Turner, F.R.S., will elevate the practice of hand-camera work by describing a simple method of surveying with a hand camera.

* * *

Bird-thieves. A certain class of paper has more than once given sensational accounts of photographic burglar detectors, a hidden camera taking an instantaneous view of the safe rifler in the very act of pursuing his nefarious operations. But it has been reserved to Mr. R. B. Lodge to act in the same way with regard to birds and their predatory acts. He has devised an ingenious arrangement, by means of which he obtains automatic photographs of the purple heron and the spoonbill in their nests. He fixes a camera near the nest in such a way that, by means of a concealed string and catch, the bird as it alights causes a plate to be exposed in a concealed camera. He writes to the August number of the "Zoologist" that the first exposure he obtained was that of a marsh harrier who had come with burglarious intent to the nest.

* * *

Artificial Indigo. Most persons who take an interest in coal-tar dyes know that they have been the means of rendering valueless thousands of acres of land in France, land used for the cultivation of madder, now almost thrown out of commerce by the introduction of artificial alizarin. A similar fate seems almost foreshadowed for the indigo plantations which cover so much ground in India. Already the artificial dye is making itself felt. It is ousting the natural product in Lyons, and already the price of the artificial governs the market price of real indigo. One firm alone asserts its power to produce one-sixth of the world's demands. It may be asked, "Where is the connection with photography?" We print this simply as a warning. For years the German chemists have been working at this subject, till at last it is a commercial success, and our supremacy in the indigo trade will be lost. Can it be doubted that they will work with equal pertinacity at the manufacture of dry plates? At present British plates beat the world, and the makers can almost sell all they can possibly turn out. But it was so with coal-tar dyes once; so it has been with indigo. Our makers, however, if they keep up with the times are not likely at present to be pushed aside; but we know what the Germans are continually doing—making good stuff, and making friends of the customers. We trust that British dry-plate makers will follow the latter system as successfully as the former. They will then have little to dread.

* * *

A Renewable Electric Lamp. In the Ironmongers' Exhibition are to be seen examples of a new lamp under this name, which is a truly descriptive title. One of the drawbacks, secondary and otherwise, of the ordinary incandescent lamp is the need of frequent renewal. Take, for example, such a light of given power used as a kind of standard light in plate-testing, &c., it is costly to renew it very often, yet, after a while, it gradually gives a less powerful light. If the testing is to be accurate it must be replaced by a new one. This new lamp is of the ordinary kind, but is well made, and averages more than the usual life, an important point at the outset, but the value is enhanced by the fact that, besides saving current, by reason of an ingenious means of attaching the filament, a new one can be put in, thus saving the lamp globe, the platinum, the wires, as often as required (provided the bulb be not broken). Practically what is done is to send the old lamp, and get a new one for half price, the "rest" being done by the makers.

NITRO-CELLULOSES.

During the last few weeks there has been appearing in the "Chemical News" a series of translations from the German technical paper, "Zeitschrift für Augewandte Chimie," 1901, heft 20, of articles over the signatures G.

Lunge and J. Bebil, and dealing, from both a theoretical and a practical standpoint, with the manufacture and composition of various kinds of nitro-celluloses. Years ago, chemists were content to class the gun-cotton or pyroxyline products of the action of mixed sulphuric and nitric acid upon raw cellulose—cotton, flax, wood fibre, &c.—under the heads of di- and tri-nitro-cellulose. Modern investigations have shown that the constitution of these gun-cottons, to use a familiar expression, is by no means of the simple character these terms would suggest. Explosive gun-cotton and soluble gun-cotton were well enough, as generally descriptive terms, but it was found that the proportions of added nitrogen varied to a considerable extent, there being now classified a series from dodeca- to tetra-nitro-cellulose, being cellulose with from twelve to four HO_3 substitutions. The above-named writers state that the molecular weight of cellulose being unknown, the number of theoretical possible stages of nitration must be left undecided. Eder is quoted as having doubled the formerly accepted formula of cellulose, $C_6H_{10}O_5$ to $C_{12}H_{20}O_{10}$; Vielle doubled it again; Mendeleef once more doubled the formula, and we got $C_{48}H_{80}O_{40}$. The writers under discussion prefer, for many reasons, Vielle's formula, and formed their calculations upon it.

As it is not possible to summarise their results, we propose only to deal with their aspects as bearing upon matters interesting to photographers. The first point that strikes the reader of these articles is likely to be the fact that the mode of production of the various celluloses upon a manufacturing scale is somewhat of a close secret. Thus reference is made to a published formula for the making of artificial silk at Besancon, the statements of formulæ being revised by Dr. Süvern in his book on artificial silk. It is stated that Lunge and Weintraube were not able to obtain collodion cotton in this manner. Now, any one who is familiar with the treatment of fibre by the mixed acids would know that such a formula is ridiculously incomplete, seeing that neither temperature nor amount of contained water is given. Then, again, we have another formula given for producing the silk nitro-cellulose, but the writers learn, privately, that it will not work, i.e., the collodion made from it will not spin. With such facts as these before us it is easy to see what an uphill task the writers had before them in examining the various products under the different conditions of varying proportions of acids to each other, the amount of water present in relation to each of the acids, and the temperature of the mixed acids during the process of nitration. The work has been well done, and a distinct addition has been made to the theoretical and practical acquaintance with the subject. We have, however, to say that if the course had been taken to consult the arehives of photography much trouble would have been saved, and the labour been directed into known channels, the more so that the experiments we are describing seem to bear mainly upon such products as are soluble in mixed ether and alcohol. It is now over forty years ago since the Rev. F. Hardwich went over the ground from an entirely practical standpoint, and gave such minute working instruction as would enable a practical chemist to turn out large quantities of soluble nitro-cellulose uniform in texture and dissolving to a uniform product. He treated the subject from three standpoints:—

1. Proportions of the two acids to one another;
2. Proportion of water in mixture;
3. Temperature of mixed acids.

He showed what was the character of the pyroxyline obtained under each of these three heads, and also by varying one constituent while leaving the remainder unaltered. When his classical essay was published he gave instructions for producing a "cotton" to dissolve in ether and alcohol for a particular purpose. But his work, as described in earlier editions of Hardwich's "Photographic Chemistry," showed the various steps in experimentation that led up to that final formula. They are a monument of patient, sincere, painstaking labour, and we feel gratified in having the opportunity of showing our respect for a great worker in photographic technics by bringing his name prominently forward in this connection. It may be noted in these articles in the "Chemical News" that the mode of nitration by mixed acids (incidental allusion being made to the possibility of nitration by nitric acid alone) is the plan adopted in the main, the method being also that recommended by Mr. Hardwich, in face of the almost general use in his time of a mixture of sulphuric acid with saltpetre (potassium nitrate). He gave his reasons for the preference, and they were eminently valid. We have no recollection of having seen since that 40 years' old publication any fully detailed description of pyroxyline making, the pitfalls to avoid, the method of judging the products, and predicting the photographic and mechanical properties of their solution in ether and alcohol. These we have tried to the extent of hundreds, we may say thousands, of times, and we have never had reason to say that any were misleading. Seeing that at the present time soluble cotton is occupying a prominent position, by reason of the manufacture of artificial silk—from collodion, spun out, dried, and de-nitrogenised—and for the manufacture of celluloid, so important to photographers, we will shortly give a brief description of the kinds of cotton to be easily made, and the factors determining their solubility, or the reverse, and the character of the dissolved product.

WATER TROUBLES.

Amongst the most frequent queries we have to reply to through the "Answers" column is the cause of spots on prints and negatives. Of course, there are spots and spots, and in nine cases out of ten they are due to lack of care in the manipulations. There are, however, cases where they are not altogether due to that cause. The spots we here refer to are small opaque ones, dark, sometimes black, and often with a nucleus. These are often due to particles of floating matter in the atmosphere, such as minute crystals of pyro or other reducing agents or, may be, of hypo, &c., splashed about the benches or spilt on the floor, which, when dry and then disturbed, float about in the air as dust. These, if they come in contact with a wet print before or after toning, may well be expected to produce a spot of the kind referred to. But there is another cause which is not always suspected, and if it were is not quite so easy to guard against, we allude to pernicious matters in the water supply. There are mostly particles of iron, due to the water being conveyed through iron pipes that have become rusty. They are usually more prevalent where the water is drawn direct from the main than when it is taken from a cistern, as there they have a chance of subsiding before the water is taken into use.

In cases where the main pipes in the roads have been recently repaired we have seen water that has been decidedly red when first drawn, and, after standing for a few hours, has deposited a red layer

of iron rust at the bottom of the vessel. This will frequently also be noticed where the water is conveyed through small iron pipes for a long distance to the work-rooms, especially after it has been resting in the pipes for a long time as, say, from Saturday till Monday. The first when drawn off is often of a red colour, due to rust, and, as might be expected, if this water were used for photographic purposes, trouble would result. In all cases it is a good precaution, before commencing work in the morning, to allow the water to run away for a short time, so as to wash out the pipes and clear them of the stagnant water that has remained in them all night, which may, or may not, be contaminated with iron. Another excellent precaution is to tie over the taps two or three thicknesses of flannel or swansdown. This should be tied very loosely, so that it forms a sort of bag a couple of inches or so below the orifice. When that is done the flow of water will not be restricted. This filter should be changed every few days, and it will be surprising the quantity of extraneous matter, mostly particles of iron, that it will usually be found to contain, even when the water is imagined to be clear. This filter also serves another purpose: it breaks the force of the water, however high the pressure may be, and thus avoids splashing or injury to tender films.

There is yet another trouble arising from water that is often unsuspected, namely, air imprisoned in it. This only occurs when the water is drawn direct from the main when it is at high pressure. We have several times seen water drawn from the supply, particularly when the mains have been under repair, that more resembled milk than water, but after standing for a short time, for the air to escape, it became perfectly clear and limpid. Now it is easy to see that if the water, as it was, were used for, say, washing prints or negatives, the imprisoned air as it expanded would give rise to blisters and other troubles. If water in this aerated condition were used in carbon printing, for mounting the exposed prints on the support when they were put into the warm water for development, the air would expand and cause blisters during the operation. This trouble is only likely to arise when the water is drawn direct from the main supply; when it is taken from the cistern, where it has had plenty of opportunity to escape, this trouble will not be met with.

AN UNSUSPECTED CAUSE OF PINHOLES IN NEGATIVES.

In some recent negatives I have been troubled with pinholes of large size and of very irregular shapes, and as they appeared on plates by various makers it was clearly not the fault of the plates themselves. But they always appeared when a particular developer was used; it was clear, therefore, that the defect was caused by the developer, and on examining the stock solution small particles of some substance were to be seen floating on the top of the liquid. These were recognised as small pieces of paraffin wax, with which the cork of the bottle of dry pyrogallic acid had been luted to make it air-tight. When the developer had been poured over the plates, the particles had become attached to the film and had prevented the developer acting upon it, and the spots so covered had fixed out clear. As I use pyro only for special work, this trouble had occurred very seldom and had escaped notice; and although metol and other forms of the newer developers are put up with the corks luted in the same way, the particles had not found their way into the developer as they are weighed out from the bottle dry. But when making up pyro solution I dissolve the sulphite of soda in hot water and pour it while warm into the dry pyro, and some of the wax clinging to the inside of the neck of the bottle had been melted by the warm solution and carried down into the developer. When cold these particles set into tiny flakes, and some are poured into the developing measure each time the solution is mixed for pouring on the plate. By passing through a funnel, with a tuft of cotton-wool lightly stuffed in the neck, the wax was filtered out, and no more pinholes appeared. Some will say that pyro should be dissolved in plain cold water, but it has been lately shown that it keeps much better in solution if dissolved in hot water, and I have found it much less discoloured if the water contains the preservative, sulphite or nitric acid, as the case may be, before the pyro is dissolved in it.

HAROLD BAKER.

AN IMPROVED METHOD OF PRODUCING ULTRA-VIOLET SENSITIVE PLATES.*

IV.

[Concluded from p. 68 of "The Chemical News."]

The Original and the Improved Method.—My method published in 1893 consisted in diluting with much water an emulsion poor in gelatine, and pouring it into basins in which the silver haloid was deposited from a thick layer upon glass plates laid inside. After the formation of the sensitive film, for which several hours were required, the emulsion was poured off, and the plates dried horizontally.

From this it is obvious that the two methods, the old and the improved, are very similar, but it would be a mistake to judge thus of the photographic nature of their plates; for the two have no more in common than their sensitiveness to ultra-violet rays, the rapid fixing and drying, and their behaviour towards potassium iodide in the developer. In their remaining characteristics they differ widely from each other.

The most striking is their relation to silver iodide. While the emulsion of the older process could stand a considerable quantity of silver iodide, the improved plate becomes fogged in its presence to the extent of being quite useless. All efforts to introduce silver iodide into the sensitive film are frustrated by the easy reduction and excessive intensity which it imparts. I have, nevertheless, after many vain attempts, made it yield to a standing development of seven hours' duration, and obtained negatives tolerably free from fogging, but it is clear that so lengthy a developing process is of no service to spectroscopy.

The improved method depends far more upon the character of the gelatine than does the older. A certain kind of gelatine, used formerly with success, now led to a series of strange irregularities. Besides a variety of spots, the film thus prepared exhibited in the wet condition a few minutes after pouring off the emulsion, a number of cracks, about $2\frac{1}{2}$ c.m. long, shaped like the tail of a comet, which made the plate useless. In another case one of our best German emulsion, gelatines gave such feebly sensitive films that it was not even possible to reproduce the wave-length 185 $\mu\mu$, which may be easily done even with the ordinary gelatine plate. But the plate completely changed its character after remaining ten minutes in a bath of warm water (38° C.), thus attaining to a surprisingly high degree of sensitiveness towards ultra-violet rays. In this case the water plays the part of a physical sensitising agent. Its sensitising action depends upon setting free the upper part of the sensitive film from its light-absorbing outer layer, and also increasing the reducing capacity of the silver bromide by warming. The sensitising action of this water-bath upon this kind of plate exceeds every experience that I have had in my years of working with ultra-violet sensitive preparations. Unfortunately the bath causes spots and drying zones of varying sensibility, so that plates of this kind cannot be recommended, all the less so that the sensitising in the bath imperils the stability of the plate.

Of the different kinds of gelatine that I have tried, one only gave permanently good films—that is the soft gelatine already mentioned of English origin that comes into the market under the trade mark Nelson No. I., known in photographic circles. Therefore I should like to advise all who wish to prepare these plates to use this gelatine and no other.

The older plate was treated with weak developer; the improved plate, on the other hand, may be treated with a solution of unusual strength, more especially not long after preparation of the plate. But, before all things, it is more reliable and more uniformly sensitive, becoming so in the process in which the coarser silver bromide particles are removed from the film during deposition.

The capacity for decomposition of rays of the sensitive plate makes it highly advantageous to the reproductions of dense groups of lines of large energy differences. My older attempts leave something to be desired in this direction, for in them the lines frequently spread themselves into an indissoluble surface, in which only the

* "Annalen der Physik, 1901, vol. v.

most marked lines could be distinguished. This objection, which is entirely due to a lack of half-tones, is obviated in the improved method by the delicate gradation of its negative.

I have already alluded to the action of potassium iodide in the developer of ultra-violet plates. I found that a few drops of a solution of 1 : 100 accelerated the appearance of the image, but also easily induced fogging, which, in distinction to the fogging of other plates, did not appear simultaneously over the whole film, but spread slowly from the edges to the middle. I have now attempted to utilise this accelerating action of potassium iodide for the improved plate, by immersing it before exposure for a few minutes in dilute solutions of potassium iodide, and then allowing it to dry. The result did not answer my expectation, for the former objections were again apparent.

Use of the Improved Plate in Spectroscopy.—The ultra-violet plate excels all others in giving faithful reproductions of the whole photographic energy of the source of light, from blue to the shortest wave-lengths, while the gelatine dry plate takes the precedence whenever the region lying beyond 220 $\mu\mu$ is not to be taken into consideration.

The sensitiveness of the ultra-violet plate first becomes marked at 220 $\mu\mu$, and increases with the refrangibility of the rays to a high degree.

The gelatine dry plate fails at 182 $\mu\mu$. It is still slightly sensitive towards the shorter waves, but it gives unreliable spectra of these, because in every case, owing to the absorption action of the gelatine, it develops as a white continuous band, and does not give the energy difference of the different waves. Hence, the ultra-violet plate is alone suitable to the photography of the spectrum beyond 182 $\mu\mu$.

VICTOR SCHUMANN.

SIMPLE METHODS OF IDENTIFICATION OF ORGANIC SUBSTANCES.

THE identification of those compounds which belong to the domain of organic chemistry is one of some difficulty, and although it is often of importance to photographers to be able to determine the nature of the substances they are using, it is scarcely ever attempted in photographic laboratories. There are two reasons for this. In the first place, it is only of recent years that sufficient has been known about organic compounds in general to enable them to be accurately identified without the use of apparatus too complicated, and methods too long, for any but an expert chemist to use; and in the second place, there are no books yet published which contain the necessary information in a convenient form. Even now there are cases where it may be impossible, merely by the use of simple tests, to positively identify a substance, but it is always possible by this means to find out the class to which it belongs, which is often all that is required. On account of the fact that many different substances give the same tests, and many substances similar in constitution give different tests, it is impossible to draw up a scheme for analysis on the same lines as those used in Inorganic Chemistry, but a list of the most useful and convenient tests will be given, and a proposed order of applying them, which, if carefully carried out should lead to the identification of all common substances.

In the absence of specific tests, the best method of procedure is first to find out what *elements* are present; secondly, what *groups* are present; and lastly, such *physical constants* as the boiling point or melting point, which, with the aid of tables or a good text-book, will lead to the determination of the substance. In addition much information may be obtained from the physical state, smell, and taste of the substance. But a great deal depends upon the reasoning powers of the experimentalist and the accuracy with which he interprets the results of his tests.

In the case of mixture of organic substances there are increased difficulties, as the substances are first to be separated, and then identified separately. As a general rule, however, the separation is fairly easily effected unless the mixture contains substances substantially alike. In most cases of mixtures it is advantageous to apply the tests to the mixture itself, before trying any method of separation, as information may thus be obtained whereby separation may be made easier.

It is hardly ever possible by means of tests alone to say what a substance is, but the group to which it belongs may be recognised, and then by the determination of its physical constants it can be identified by reference to a text-book of Organic Chemistry.

In applying the tests it is advisable to use as small a quantity as possible of the substance and to allow plenty of time for a reaction to take place. Occasionally it will take ten minutes or more for a precipitate or a coloration to form, and then only on warming, so unless this be borne in mind it is easy to be mislead by negative results. It may be of use to give a list of reagents. The following are absolutely necessary:—

Sulphuric acid	concentrated or dilute.
Nitric acid	concentrated or dilute.
Hydrochloric acid	concentrated or dilute.
Sodium hydrate	strong and weak solutions.
Sodium carbonate	ten per cent. solution.
Ferric chloride.....	neutral solutions in alcohol and water.
Ferrous sulphate	strong solution.
Ammonium hydrate ..	strong solution.
Silver nitrate	solution.
Sodium nitro-prusside..	weak solution.
Fehling's solution	
Soda-lime	
Calcium chloride.....	lumps and solution.
Copper oxide	a small lump.
Potassium.....	metallic.
Alcohol	well dried.
Ether	free from water and alcohol.
Sodium nitrate	strong solution.
Litmus paper	or neutral solution.

Also useful are: Chloroform, benzine, phosphorous pentachloride, acetyl chloride, bromine water, or a solution of iodine in potassium iodide.

Certain of the tests require performing in a special way, and before giving the scheme it will be necessary to describe them. One of the most useful tests, and one that should never be omitted, is that of heating the substance with metallic potassium, by which means all the elements present other than carbon, hydrogen, and oxygen, can be determined. The most likely elements to be present, are sulphur, nitrogen, and the halogens. Carbon and hydrogen are, of course, present in all organic compounds, and oxygen in most, but the others must also be looked for. The test is as follows: A small piece of potassium about the size of a pea is dropped into a small *hard* glass tube about 15 cm. long and $1\frac{1}{2}$ cm. in diameter, which has been drawn off and sealed at one end. This is then heated until the vapour of the potassium has risen half-way up the tube, which is supported in a vertical position. Four or five drops of the substance if a liquid, or corresponding small pieces if a solid, are then dropped down the tube on to the melted potassium. A reaction will be seen to take place. The tube is then raised to a red heat for a few minutes, and allowed to cool. When cool, the excess of potassium is removed by as small a quantity of alcohol as possible, and the contents of the tube are washed out with a little hot water and boiled. The solution thus obtained should then be filtered free of any charred particles, and diluted until its volume is about 15 c. c. This solution then contains the sulphur as potassium hydrosulphide, the nitrogen as potassium cyanide or sulphocyanide, and the halogens as potassium halide. The following tests should then be made on separate portions of the solution:—

1. Add a few drops of sodium nitro-prusside solution. A purple coloration indicates the presence of *sulphur*.

2. Just acidify a small quantity of the solution, and add a few drops of ferric chloride. A blood-red coloration indicates the presence of sulphocyanide, *i.e.*, the presence of *sulphur* and *nitrogen*.

3. Make a small quantity strongly alkaline with sodium hydrate. add a few drops each of ferric chloride and ferrous sulphate, boil vigorously for five minutes, and add hydrochloric acid till the pre-

cipitate is just dissolved. A pronounced green colour or a blue precipitate indicates the presence of *nitrogen*. The precipitate often only appears on standing for some time.

4. Boil a small quantity of the solution with nitric acid for five minutes, and add silver nitrate. A precipitate indicates the presence of halogen, which can be identified in the usual way.

One of the best tests for the presence of halogen is that known as "Beilstein's." A small lump of copper oxide is wrapped round with platinum wire, and held in the Bunsen flame until it no longer imparts a green colour to the flame. A small quantity of the substance is then placed upon it, and it is again held in the flame. If halogens are present, the green colour reappears.

Another test which requires making with some care is the reduction of ammoniacal silver nitrate. A test-tube is first thoroughly cleaned by boiling in it a strong solution of sodium hydrate. A few c. c. of silver nitrate are then placed in it, about five drops of strong sodium hydrate solution are added, and sufficient strong ammonia solution to dissolve the precipitate of silver hydroxide and to make the solution smell strongly of ammonia. The tube is then held on the slant, and a strong solution of the substance is poured down the side of the tube. The test is only positive when a silver mirror is produced.

The determination of the melting point and boiling point are most important, as it is by means of one or the other of these, or if possible, of both that precise identification is obtained. The determination of the melting point is carried out as follows. A small portion of the substance is very finely powdered and well dried in a desiccator. A test-tube is then drawn out in the blowpipe flame to a narrow tube not more than 1 mm. in diameter. A length of this fine tube about 6 cm. long is cut off and sealed up at one end. When cool, the dried finely powdered substance is introduced into the tube and shaken down to the sealed end, till it rises about 3 mm. in the tube. This is an operation requiring a certain amount of patience and care, as the powder should be fairly tightly packed. The small tube containing the substance is then attached to a thermometer reading to 360° C., by means of indiarubber bands, so that the sealed end of the tube is on a level with the bottom of the thermometer bulb. The thermometer and the tube attached are then placed in a small beaker containing some clear liquid with a fairly high boiling point, so that the open end of the tube is about 1 cm. above the surface of the liquid, and the bulb of the thermometer is at least 4 or 5 cms. above the bottom of the beaker. If the melting point of the substance is below 100° C., water may be placed in the beaker. For higher melting points concentrated sulphuric acid (to which a little solid sodium nitrate has been added to keep it clear), or white paraffin wax is used. The liquid in the beaker is then slowly heated and kept well stirred. The substance in the fine tube should be carefully watched, and when it melts, the temperature should be read off as accurately as possible. If pure, the substance should melt completely within the limit of 1° C. If it does not, it is too impure, and the experiment should be performed again with a portion of the substance which has been purified by recrystallisation from some suitable solvent.

The determination of the boiling point is one requiring great care when dealing with small quantities of liquid, as is usually inevitable. It can, however, be determined with a fair degree of accuracy by means of a simple apparatus designed by the author. A piece of tubing of large enough diameter (say 1·5 cm.) to admit the thermometer easily is sealed off at one end, and blown out into a bulb of about 3 to 4 cm. diameter. It should be about 25 cm. in length. A square of asbestos cardboard, pierced with a hole of such a size that the tube easily passes through it is then slipped down and allowed to rest upon the bulb at the end. This is to prevent superheating of the thermometer. The bulb is then rather more than half filled with the liquid of which the boiling point is required, and the thermometer with a very small portion of cotton-wool wrapped round the bulb is lowered into the tube until the bulb is at least 2 cm. above the surface of the liquid. The bulb containing the liquid is then very carefully heated on a square of asbestos cardboard. As soon as it is quietly boiling, the thermometer should be watched, and in a short time should become steady. This is the boiling point of the liquid. If the thermometer does not become steady, but continue to rise, the liquid is not pure, and should be redistilled. A limit of about 2° C. is permissible. This form of apparatus, which is best made of hard glass, will be found very simple and convenient, as it works well with small quantities of liquid, and the long stem of the bulb acting as a condenser, prevents any waste of the substance which is usually an important consideration. If the liquid seems likely to "bump," it is necessary to place a few small chips of porcelain tile, or clean sand in the bulb. This will cause it to boil steadily and quietly.

In dealing with mixtures it is necessary to separate the substances before they can be identified. The chief methods of separation are:

1. *By Solution.*—Often one substance is soluble in a solvent in which the others are not. It is therefore useful to try the action of various solvents upon a mixture of water, alcohol, ether, benzene, glacial acetic acid, sodium carbonate solution.

2. *By Chemical Agents.*—(*a*) Sodium hydrate solution, generally in conjunction with ether extraction. (*b*) Acid solution, generally in conjunction with ether extraction.

3. *Steam Distillation.*

4. *Fractional Distillation.*

Of the methods capable of the most general application, the one most generally applied is that by means of a strong solution of sodium hydrate. The methods of procedure is as follows.

About twenty grains of the mixture are treated with a strong solution of sodium hydrate and warmed. The mixture is then cooled and is vigorously shaken up several times with different quantities of ether, which is removed each time by means of a separating funnel. The sodium hydrate solution will contain the acids and phenols, and the ether will contain the bases and hydrocarbons. The ether should then be treated with a fairly strong acid solution, being well shaken and separated as before. The acid solution will then contain the bases, and the ether the hydrocarbons. The sodium hydrate solution, and the acid solution, should then be made acid and alkaline respectively, and unless precipitation takes place, extracted with ether. The various products resulting from precipitation or by evaporation of the ether should be then separately examined. Acids and phenols can be separated by sodium carbonate solution in which phenols are insoluble.

Although this is by far the most general method of separation it is rather a long process, and if separation can be effected by some solvent, this latter method should be used. The methods by steam-distillation and fractionation are not so generally applicable, and require apparatus which is not within the reach of ordinary experimentalists. It must be noted that it is only with great skill and experience that mixtures containing more than two, or at most three substances can be separated and identified, but with ordinary care there should be no great difficulty in separating two or three substances.

In some cases it is necessary to obtain the molecular weight of the substance. The are many methods of doing this, *e.g.*, percentage composition, vapour density, osmotic pressure, depression of freezing point, elevation of boiling point &c., but these all require complicated apparatus. There are, however, two cases in which the molecular weight is easily determined if a delicate balance is available, viz., acids and bases. In the case of acids, the silver salt (which is easily obtained pure) is prepared, and from the quantity of metal, determined in the usual way, in a given weight of the salt, the equivalent formula of the acid is easily calculated. In the case of a base, the platinum double salt is prepared, the constitution of which is analogous to that of the ammonio-platinum chloride $P + Cl_4 2 (NH_4Cl)$. The quantity of platinum in the double salt is determined by ignition and the quantity of constituent combined with one atom of platinum is calculated. From the number thus found subtract six atoms of chlorine, two atoms of hydrogen and divide by two. The result will be the molecular weight of the base. It is obvious that the molecular weights of acids and bases can also be found by titration if the basicity and acidity be known.

In carrying out the following tests, it must be remembered that everything must be closely observed, and the smallest peculiarity of behaviour carefully noted. If a gas be given off, it is necessary to try and identify it, and in all cases any peculiar odours should be noted.

List of Tests.

1. *Heat on Platinum Foil.*—Note the luminosity and smokiness of the flame. Simple aliphatic saturated bodies give non-smoky flame. Higher aliphatic saturated and all unsaturated bodies give smoky flame. Aromatic bodies give a very smoky and luminous flame. Nitro bodies deflagrate on burning. If an ash is left, moisten with HCl and observe if there is any effervescence. This indicates the presence of an organic salt of the alkalies or alkaline earths, and the metal present should be ascertained in the usual way.

2. *Heat in Test-tube alone.*—This should give a rough idea of melting or boiling point. Ammonia evolved indicates presence of urea or derivatives, *e.g.*, guanidine, carbamates. Odour of burnt sugar indicates carbo-hydrates, tartaric acid, citric acid. Characteristic odours are given by naphthalene, succinic acid, benzoic acid, &c.

3. *Treat with Concentrated Sulphuric Acid.*—Highly oxygenated bodies containing hydroxyl blacken on warming. Hydro-carbons are not attacked. Certain bodies give characteristic colours:—Nitroso bodies mixed with phenols give green, which on diluting turns to red, and turns blue or green again on adding excess of sodium hydrate. Amines on treatment with nitrous acid give nitroso bodies, and will then give this reaction. Hydroquinone gives a green coloration. Salicin gives a red.

4. *Warm carefully with a Mixture of Concentrated Sulphuric Acid and fuming Nitric Acid.*—A reaction will probably take place. Aliphatic bodies will decompose and aromatic bodies will form sulphuric acids which will crystallise out on pouring into cold water. Thus this test, in conjunction with the flame test, distinguishes between the aliphatic and aromatic series. Certain bodies give characteristic colours: Morphine gives blood red. Diphenylamine gives blue.

5. *Fuse with Potassium in a Hard Glass Tube,* and test for sulphur, nitrogen, and halogens. Here apply Balstein's test for halogens. These tests have already been fully described.

6. *Treat with water,* shaking well and finally heating. Note whether soluble and to what extent. Test the solution with litmus paper, and ascertain by means of a weak solution of sodium carbonate whether an acid reaction is due to the substance itself, or only to a small quantity of impurity, and similarly test an alkaline reaction with weak hydrochloric acid solution. Phenol turns blue litmus purple. If the action is strongly acid, it is useful to apply a few tests for the commoner organic acids, *e.g.*, formic, acetic, tartaric, citric, succinic, benzoic, oxalic, salicylic. This should also be done if from Test 1 a metallic salt is suspected. If the substance is insoluble in hot and cold water, apply the muroxide test for uric acid and derivatives at once.

7. *To a neutral solution of the substance add a few drops of neutral ferric chloride solution.*—A coloration usually shows the presence of phenolic compounds. But it must be remembered that most compounds containing the hydroxyl group will give a slight coloration, that many amines do so, and that nitro-phenols and meta and para-oxy acids do not. Oxy-acids of the aliphatic series give a strong yellow coloration. Cresols give bluish. Monhydric phenols give purple. Dihydric phenols give green. Hydroquinone and its derivatives give a green coloration at first, rapidly changing to a deep reddish orange with separation of green metallic-looking needles of quinhydrone. α-Naphthol gives a purple colouration and precipitate. β-Napthol gives a green coloration and precipitate. α-Naphthylamine gives an azure blue precipitate. With acids ferric chloride gives the following precipitates:—

Red.....	Acetate, formate, sulphocyanide.
Buff	Benzoate, hippurate.
Red brown....	Succinate.
Black	Tannate gallate.
Violet	Salicylate.

8. *Treat with fairly dilute hydrochloric or sulphuric acid.*—If the substance is soluble, it indicates the presence of a base, *e.g.*, amines, amido-acids, alkaloids. With dilute sulphuric acid quinine gives a beautiful blue fluorescence. Warm, and note if there is any decomposition, indicating the presence of oxime, hydrazine, nitride or glucoside. In the case of mixtures note if this test gives a separation.

9. *Treat with fairly strong caustic soda solution.*—Note the solubility, which will indicate if the substance is an acid or a phenol. Warm, and note if there is any decomposition. Nitrites give off ammonia, similarly amides. Substituted amides give off amines (odour resembles that of ammonia). Esters give the corresponding alcohol which can be recognised by oxidation with potassium permangate to aldehyde. Chloral gives off chloroform, recognised by its odour. Most intro-compounds, especially those containing more than one intro-group, give deep yellow or red colorations.

After boiling well, acidify with hydrochloric acid. If aromatic acids are present (except sulphonic) they will be precipitated. Sulphonic acids usually separate on cooling. If the presence of another acid is suspected extract with ether, and evaporate the ethereal solution. Note if this test has given a separation if dealing with a mixture. Nitrites, esters and amides, on decomposition with sodium hydrate all give the sodium salt of the corresponding acid; this should be isolated as described above and identified.

10. *Treat with Fehling's solution and ammoniacal silver nitrate,* first in the cold and secondly on warming. Reduction of Fehling's solution results in the formation of a red precipitate, and reduction of silver nitrate in the formation of a silver mirror as already described.

In the *cold,* reduction is effected by aldehydes (including the aldose sugars), polyhydric ortho- and para-phenols, phenyl hydrazine, hydroxylamine, and certain amido-phenols, *e.g.*, rodinal (para-amido-phenol).

In the *hot* solution, reduction is effected by ketones (including ketose sugars) tartrates, and aromatic aldehydes when the aldehyde group $\left(-C\overset{H}{\underset{O}{<}} \right)$ is directly united to the benzine ring.

If reduction takes place, apply the following tests:—

(*a*) To some rosaniline hydrochloride which has been decolorised with sulphurous acid, add some of the substance. A return of the colour indicates the presence of aldehyde (Caro's reaction).

(*b*) To a saturated solution of sodium bisulphite, add a strong solution of the substance. A precipitate indicates aldehydes or ketones.

(*c*) Heat a small portion of the substance with aniline. A neatly solid crystalline mass on cooling indicates presence of aldehyde.

11. *Heat with soda-lime in a hard glass tube.* The soda-lime should be crushed to a powder and intimately mixed with the substance.

Ammonia given off indicates presence of amines, amides, and imides. Sometimes on account of fumes, the ammonia can only be recognised by moistened litmus paper. Carboxylic acids give the parent hydrocarbon. Phenolic compounds give phenol. Glycocoll gives methyl amine (recognised by its odour).

12. *Test the solubility of the substance in various solvents — e.g.,* alcohol, ether, &c. This, in the case of mixtures, may indicate an easy separation. The only common organic acids which are readily soluble in ether are those of the fatty series.

13. *Test for the hydroxyl group with potassium.*—For this test the substance must be perfectly dry. Liquids can usually be dried with lumps of fused calcium chloride or with potassium carbonate. A small piece of clean potassium is placed in the liquid. If a hydroxyl group is present there will be an evolution of hydrogen. Solids are best dissolved in ether free from alcohol or water. Resorcin and salicylic acid do not give this test, and a few animes do give it, as does quinone.

14. *Some special tests* if ammonia is given off on heating with soda-lime:—

(*a*) Uric acid and derivatives (Purin group). Evaporate to dryness with nitric acid and moisten the dried mass with ammonia solution. All substances belonging to the purin group give a purple red colour (*Murexide reaction*).

(*b*) Boil with strong sodium hydrate solution, and pass the resulting gases through lime water. A white precipitate indicates carbon dioxide, and smell of ammonia indicates urea.

(*c*) Test for primary, secondary, and tertiary amines with nitrous acid. This is done by making an acid solution of the amine, and adding a strong solution of sodium nitrite.

An evolution of gas (nitrogen) indicates a primary amine. If no evolution of gas is seen, add some phenol and strong sulphuric acid. Secondary amines give the nitroso reaction, and tertiary amines no reaction at all.

Primary amines are also distinguished by the *isonitrite* test. A small portion of the substance is heated with chloroform and alcoholic caustic soda. An exceedingly disagreeable odour, due to the formation of isocyanide, indicates the presence of a primary amine.

15. *Fuse with phthallic anhydride,* and dissolve the resulting mass in alkaline solution. If the solution is fluorescent, due to the formation of fluorescence, it shows the presence of a phenol.

16. *Determine the melting point* if the substance is a solid, or the *boiling point* if the substance is a liquid.

There are two classes of substances not included in the above list the albumens and alkaloids. Their chief characteristics are given below.

Albumens always contain nitrogen and sulphur, and are insoluble in alcohol and ether. The chief tests are:—

1. A yellow colour on boiling with nitric acid, which changes to a golden yellow on neutralising with ammonia.

2. Violet coloration on boiling with fuming hydrochloric acid.

3. On boiling with caustic soda, ammonia is evolved, and an alkaline sulphide is left in solution, which gives a violet coloration with sodium nitro-prusside.

Alkaloids are distinguished by being soluble in acids, and precipitated from their acid solution by platinic chloride. Also they all give a yellowish-brown precipitate with a solution of iodine in potassium iodide. The tests for the chief alkaloids are:—

Brucine....	soluble in concentrated nitric acid, giving a red colour.
Morphine ..	gives a red colour in concentrated sulphuric acid with a trace of nitric acid, and gives a blue coloration.
Quinine....	gives a blue fluorescence in sulphuric acid solution. Chlorine water and ammonia give a green precipitate, soluble in excess of ammonia to a green solution. Cinchonine gives a similar precipitate but insoluble in excess of ammonia.
Strychnine..	Evaporate to dryness with a mixture of nitric and sulphuric acids. Moisten the mass with concentrated sulphuric acid and add one drop of potassium dichromate. A dark purple-blue coloration indicates strychnine.
Caffeine ..	On evaporation to dryness with chlorine water leaves a reddish-brown spot which turns violet-red when moistened with ammonia solution.

It may be useful to summarise the chief group tests. Only an indication of the nature of the test will be given, as they have all been referred to in the preceding list.

Amino	$-NH_2$	basic properties, action with nitrous acid, evolution of ammonia with soda lime, isonitrite test.
Carboxyl	$-C\overset{O}{\underset{OH}{<}}$	acid properties, formation of characteristic salts with metals, esterification.
Nitro	$-N\overset{O}{\underset{O}{<}}$	deflagration, coloration with caustic soda, reduction products.
Sulphonic acid	$-SO_2OH$....	Acid properties, solubility, presence of sulphur, fusion with KOH.
Hydroxyl	$-OH$.....	Colouration with ferric chloride, action of potassium.
Aldehyde	$-C\overset{H}{\underset{O}{<}}$	Reducing powers, bisulphite reaction, aruline reaction, Caro's reaction.
Ketonic	$>C=O$	Reducing power, bisulphite reaction.

Athough every effort has been made to make the above list of tests as exhaustive as possible, instances may occasionally occur when it is not possible to exactly identify the substance without some further tests. Thus from the results of the group tests, and from the melting or boiling point it may be certain that an unknown substance is one of two or three, between which it is impossible to distinguish with the foregoing tests. In such a case the only course to take is to refer to these various substances in a text-book, and apply any further tests which may be suggested by their properties. Such cases as this will be rare, however, for such a difficulty seldom arises except in distinguishing between members of a homologous series, and then the melting or boiling point will nearly always settle the question.

J. Vincent Elsden, B.Sc. (Lond.)

THOUGHTS CONCERNING THE NATURE OF THE LATENT IMAGE.

III.

The preceding work concerning the latent image was finished in November of last year, but since then I have continued my investigations, partly by extending the experiments already described, and partly by undertaking others on different lines in the endeavour to get nearer to a solution of the problem.

I should like in the first place to describe some experiments which I have made in consequence of correspondence with Eder. Eder reminded me of the possibility of bromine attaching itself molecularly to silver bromide, and that an explanation might thus be found for the loss of sensitiveness which I had observed with collodion emulsion plates dipped in bromine water before exposure. In the event of bromine attaching itself molecularly to silver bromide, it might be presumed that powerful absorbers of bromine would attract the halogen, and thus counteract the action detrimental to sensitiveness.

I used sodium nitrate for the purpose, which immediately reacts upon bromine, even when it is much diluted, and it is improbable that it reacts upon silver bromide. I found that dipping the plate for two minutes in a 2 per cent. solution of sodium nitrite, followed by washing, did not exercise the slightest influence, either upon a fresh collodio-bromide plate, or upon one which had been previously dipped in a 0.5 per cent. solution of bromine. The silver bromide was not affected in the least even by a 10 per cent. solution of sodium sulphite, nor was a plate which had been previously dipped in bromine water. It seems therefore that a molecular attachment of Br to AgBr is excluded.

It will have been noticed that my experiments with collodion emulsion plates disclosed that the latent image is destroyed by nitric acid. This was in apparent contradiction to the experiments made by Eder, who obtained the opposite with wet collodion plates. Eder pointed out to me that collodio-bromide emulsions often contain traces of bromine salts, which are tenaciously held, and in this case the nitric acid might liberate bromine, which might destroy the image. In the case of a wet plate this possibility would be excluded by the presence of excess of silver. I consequently tried to render any possible traces of bromine salts harmless by treating the plates with a solution of silver. As it was found that rather strong neutral silver baths completely veiled the collodion emulsion, I could only use very weak acid solutions of silver.

The stock solution was formed of a 20 c. c. of a 10 per cent. solution of silver nitrate, plus 5 c. c. of nitric acid, sp. gr. 1.4 and 175 c. c. of water. This was diluted for use to one-tenth of its strength. The collodion emulsion plates were dipped in it for two minutes, and then thoroughly washed. It was found that the bath increased the sensitiveness considerably. If a plate treated in this manner with an acid silver bath is exposed, and then subjected to the action of strongest nitric acid, the latent image will still be completely destroyed. As the sensitiveness was raised by the silver bath, it follows that possible traces of a bromine salt had certainly been converted, and that the action of the nitric acid cannot be indirectly explained by the intervention of bromine. The action of silver nitrate upon collodio-bromide emulsion is very peculiar. If the plate be dipped for two minutes in a 1 per cent. silver bath, and then thoroughly washed and exposed, we obtain, as already stated, a completely veiled plate with a very indistinct image. If a plate, previously dipped for one minute in a 0.5 per cent. solution of bromine, be treated in the same manner in the silver bath, a clear negative is obtained, which looks as though it had received considerably more exposure than the plate treated with bromine only, and it is equal to a plate coated with normal emulsion.

If a plate be first treated with silver, and then with bromine, the same result follows as in the reverse procedure. The veiling action of the silver bath is counteracted. A very striking fact was observed in the action of the silver bath upon the collodion emulsion. The colour of the film was considerably changed, and passed from bluish-white to yellowish-white. On the other hand, treatment with bromine did not cause any perceptible change of colour.

The action of the silver bath upon a plate previously treated with bromine might easily lead to the mistake that the bromine remains in some form upon the plate, notwithstanding the washing process, and that this added bromine is converted to bromide of silver by the silver bath. But I do not see any reason on chemical grounds why the nitrite and sulphite should not have acted the same in this case. It is improbable that silver nitrate should be permanently precipitated from the dilute solution upon the bromide plate, and, as we had to conclude that the action of the silver nitrate brings about a physical modification of the silver bromide, we may as reasonably infer the same in regard to the bromine.

I must also mention that the addition of silver nitrate to a finished collodion emulsion increases the sensitiveness considerably. This remains unaffected by washing. The well-known difference in sensitiveness of collodio-bromide emulsions prepared with excess of silver, or bromide, is still observable when the silver bromide is prepared with excess of bromide and the emulsion digested with silver nitrate after it has been washed.

Further experiments in regard to the action of nitric acid upon the latent image not only gave the answer to the contradiction between Eder's results and my own, but an entirely new point of view for the consideration of the latent image. By using the above-mentioned stock solution of acid silver nitrate without dilution before exposure, and submitting the latent image to a bath of strongest nitric acid, a distinct image was obtained, but no image appeared when the silver bath (or one reduced to one-tenth of its strength, as previously mentioned) was omitted. In the same way that a silver bath of suitable strength, used under otherwise similar conditions, will prevent the complete destruction of the latent image, so the action of nitric acid may be compensated for by prolonged exposure. An exposure of forty minutes sufficed to produce upon a plate, afterwards dipped for one minute in strongest nitric acid, an image of the same strength that an undipped plate gave in one minute. The reverse is also true. By prolonging the action of the acid bath (four minutes instead of one minute) no trace of an image is obtained with forty times the exposure.

It is thus comprehensible why Eder found that the latent image was not destroyed. He used considerable quantities of silver nitrate, and the acid was of far lower strength than that used in my experiments. But a new light is thrown upon the nature of the latent image by the fact that light action and a preparatory silver bath on the one hand, and strength and duration of the acid bath on the other hand, may mutually replace each other, and give the same negative.

From these experiments it follows that the meaning we attach to the destruction of the latent image is quite relative and fluctuating. But, according to my conception of the subject, the probability is that it should be quite definite, if the latent image is a definite chemical substance, which differs from silver bromide in its composition, be it metallic silver, hypothetical sub-bromide (Ag_2Br), or any other compound of silver with bromine of a different degree of oxidation; or, lastly, a compound of any of these bodies with the organic substance forming the support. If we assume that in prolonging the exposure a larger quantity of the "substance" of the latent image is formed, and that this substance is converted to an irreducible silver bromide, or something else, according to the old formula,

$$4Ag_2Br+6HNO_3=4AgBr+4AgNO_3+N_2O_3+3H_2O,$$

then it seems probable that this substance would be destroyed by the large excess of nitric acid in its evident fine state of division within the sensitive film, be its quantity X or 40 X. This view receives considerable support from the thermo-chemical calculation of Hurter and Driffield (Eder's "Jahrbuch," 1899, page 202), which shows that the amount of light action which is effective in a normal exposure represents but a small fraction of the energy required to produce complete chemical decomposition of the silver bromide. By adopting the sub-bromide theory, we could merely assume the existence of nascent sub-bromide, and the setting up of further reduction by development in the same manner as shown in my first experiments by the introduction of metallic silver and bromised silver into collodio-bromide emulsion. The experiment with nitric acid, and that with bromine and silver nitrate, seem, in my opinion, to support the view that the latent image is a physically changed modification of silver bromide. As we are also able to show that such enormous differences in the modifications of silver bromide exist, we must further assume that a few varieties, more or less, are not a matter of importance.

In my first paper I mentioned that we find ourselves in a circulus vitiosus regarding the nitric acid experiment and its bearing upon the sub-bromide theory.

Has it actually been proved that any one has produced sub-bromide of silver identical with the unknown hypothetical "substance" of the latent image? In chemical literature (see Dammer's "Handbuch der Anorganischen Chemie," vol. ii., part ii., page 772) silver sub-bromide is quite unknown. On the other hand, we have many references to sub-chloride, and the existence of a sub-chloride prepared from Ag_2O, in the form of a brown powder, seems to be fairly established. The data concerning the composition of this sub-chloride fluctuate between the formulæ

$$Ag_4Cl_2 \ (=2Ag_2Cl) \text{ and } Ag_4Cl_3.$$

It is stated in regard to this sub-chloride that its dark colour remains unchanged by the action of nitric acid, and that no silver is taken up from it by warm nitric acid. The reaction of this sub-haloid supports the view that the latent image must be insoluble in nitric acid if it consists of sub-bromide. It is a hazardous undertaking to transfer the properties of a substance prepared in the manner described above to the hypothetical substance of similar chemical composition in the latent image, where quite different molecular conditions and finer divisions obtain, but in that case the supposed confirmation of the reaction of nitric acid upon the photographic plate does not hold good. It is quite true that the bromide of silver of a gelatine plate, which has been much darkened by exposure to light, does not lose its colour by prolonged boiling in nitric acid, but silver bromide which has visibly darkened by exposure to light has become quite solarised, and, although the properties of this substance may be of value in the examination of the problem of solarisation, they are beside the mark in considering the question of the latent image in its restricted sense.

Within the limits of these experiments it seemed of interest to make further attempts to prepare some true silver sub-bromide, so as to study its properties with certainty. In my first paper I have shown that the direct bromising of metallic silver in a gelatine emulsion was a failure because of the simultaneous action of the bromine upon the gelatine. Otto Vogel's method of preparing silver sub-bromide by way of the analogous compound of copper was also impossible with gelatine. But I succeeded in preparing an emulsion of a substance, by way of sub-bromide of mercury, which may be termed silver sub-bromide with some show of reason. Fifty grammes of gelatine and 4 grammes of ammonium bromide were dissolved in 500 c. c. of water. At 40° C. a cold solution of 10 grammes of mercurous nitrate dissolved in 100 c. c. of water and 3 grammes of nitric acid sp. gr. 1.4 was added. The mercurous nitrate is rapidly decomposed, notwithstanding the free acid, and, as basic salts are formed, the solution must be used at once. A bluish-white, very fine-grained emulsion of sub-bromide of mercury was obtained, which was poured out to set, then broken up, and washed for two hours. If a solution of nitrate of silver be added to a small quantity of this emulsion, the gelatine will coagulate immediately by the formation of the mercurous salt, and it is consequently necessary previously to add 20 c. c. of glacial acetic acid. A solution of 16 grammes of silver nitrate in 100 c. c. of water may then he added in small quantities to the emulsion of sub-bromide of mercury. This is considerably in excess of the theoretical quantity necessary (13 grammes). It produced an extremely fine grained emulsion of a brownish-black colour, which I thought I was entitled to regard as sub-bromide of silver. After setting, the emulsion was broken up and washed for twelve hours in running water. The colour changed considerably, and was of a rather light blue-grey tint.

By treating this emulsion with strongest nitric acid the colour rapidly changes to yellowish-white, and bromide of silver is formed. As the emulsion contains a considerable quantity of water, which much reduces the strength of the acid, this indicates that the sub-bromide is readily reacted upon by nitric acid. The ease with which the sub-bromide of silver could be converted, and the importance of the fact in its bearing upon several theoretical questions, suggested the desirability of establishing with greater certainty that the substance was in reality sub-bromide. With this object in view, and to facilitate an analysis, the simplest manner seemed to be to prepare

the sub-bromide by means of sub-bromide of mercury without the presence of gelatine.

Four grammes of bromide of ammonium were dissolved in 250 c. c. of water, and to this was added 10 grammes of mercurous nitrate dissolved in 3 grammes of strongest nitric acid in 100 c. c. of water. The sub-bromide of mercury was of a brownish-yellow colour. By adding 14 grammes of silver nitrate dissolved in 100 c. c. of water, much to my astonishment, only a change in colour of the flakes of sub-bromide of mercury to a greenish-white followed, instead of the formation of the dark substance, as in the experiment in the presence of gelatine. The filtrate of these flakes was blackened by ammonia, which indicated the presence of soluble mercurous oxide. The addition of silver to the clear solution produced no change, indicating that there was no halogen present. The addition of nitric acid produced a white precipitate, which was boiled several times in water, and, as might be expected, ammonia turned it black, indicating the presence of a mercurous salt. As the ammoniacal filtrate after neutralisation with nitric acid again produced a white precipitate, the presence of silver was indicated. With regard to the greenish-white precipitate itself, it was found, after thorough washing, to contain silver as well as mercury. Consequently, instead of pure silver sub-bromide, we had some compound or mixture, which was left undetermined, as it was of no interest for the question under consideration. For the sake of accuracy, I would mention that in the gelatine experiment the necessary acetic acid was added upon repeating the decomposition of the precipitated sub-bromide of mercury with nitrate of silver, and that no difference was found. It was thus impossible by such means to obtain better grounds for the supposition that sub-bromide of silver had been formed by decomposition of mercurous bromide with silver nitrate, and from this last experiment I do not think it at all probable that I had obtained a pure emulsion of silver sub-bromide, especially as the very remarkable change in colour during the washing could not be accounted for.

Nevertheless, I look upon this experiment as a fresh proof that our theory of a sub-bromide is without any foundation, as well as showing how difficult it is to produce sub-bromide.

At the seventh meeting of the German Electro-chemical Association, Professor Rich. Lorenz, of Zurich, read a paper upon a series of experiments in the electrolysis of fused salts and the behaviour of metals.

Lorenz submitted a series of metallic salts in the fused state to electrolysis, and found that halogen is dissipated, and that the metallic regulus at certain temperatures is partly dissolved in the fused mass.

Lorenz states: It has not yet been established whether this phenomenon, which is of very common occurrence, is due to the metal dissolving in the fused mass, the formation of traces of sub-chloride, or its dissipation as a fine dust, or whether several of these causes are combined. We have hitherto always attributed it to an actual solution of the metal in the fused mass, since it still seemed to be the most plausible assumption, according to all appearances. I have therefore adopted the expression "metallic solution" for my present purpose, but with the reservation that it may not be found quite exact. A second chemical reaction depends upon this solubility of metals in the fused mass, and many metallic halogenides are affected by it. Water does not assist, but under certain circumstances light does. The decomposition occurs more especially with the iodides, and takes place according to the following formula:—

$$n.MI_2 = \underbrace{(n-1)MI_2 + M}_{\text{Metallic solution.}} + I_2.$$

Therefore without the action of the air, or moisture, traces of halogen disappear, and "saturated metallic solution" is left in the fused mass. From this it seems possible that this reaction may perhaps play a part in the formation of the latent image upon the photographic plate. It is conceivable that bromine, as such, is liberated in minute traces during exposure, and that a fixed solution of silver in silver bromide remains, which induces the formation of the first traces of nascent silver.

Although Lorenz refrains from expressing any positive opinion in these sentences concerning the nature of the latent image, the fact remains, which is not without interest to the present question, that such a fixed solution of metal in a halogen compound has been pointed out. I also think it is not impossible that a metal in such a state of fixed solution should behave in the presence of chemical reagents in a manner differing from its normal state. We thus have another indication that we must not interpret with absolute certainty by purely chemical reactions all that happens in the sensitive film. Assuming then the possibility of our having an unquestionable sub-bromide of silver, that we know exactly the behaviour of this substance, and consequently its action in the presence of nitric acid, we should not attempt to infer from an analogous case of such a reagent in regard to the latent image that the constitution is the same. With reference to degree of strength and length of action, we have no information whatever to guide us as to the effect of nitric acid upon sub-bromide, and as the results of our experiments relating to the action of nitric acid upon the latent image differed considerably from one another, we are quite unable to deduce anything from them for or against the sub-bromide theory.

DR. LUPPO CRAMER.

Studio Gossip.

THE "American Callityper" is the name of a new paper which the publisher, Jacob Backes, 78, Bible House, New York, hopes will educate typewriters, authors, and others to be their own printers. The copy for the first issue, says "Invention," was written out on the typewriter and reduced by photo-engraving. Plates were then made, and from these the paper was printed. All of the pages in the first issue were composed without changing a single character on the machine; but by making the original writing of the pages systematically wider and longer than the sizes in which they were printed, and by making certain degrees of reduction in the line engraving, different sizes of type were secured corresponding to regular typographical "point" gradations. The author claims that by a combination of callitypy, as he designates the new process, good pen work and line engraving, any one can get out what is wanted more artistically and economically than by any other method of typography.

PICTURE Post-cards.—As so many pictorial post-cards rely upon photography for the illustrations, the following notes on the subject, from a New York contemporary, may be of interest to our readers:—"The sending of these cards from Europe is particularly in vogue, indeed, the practice of collecting and preserving them has grown into a popular pursuit. The prevalence and rapid rise of the fad is something astounding. Although 100 years ago a few precursors of the modern card might be found in hotels in Italy, the first of the present order did not appear until 1855 in Basle. This made no impression, however, and illustrated cards were practically unknown until their introduction into Germany in 1870, and then into France in 1872. The adoption of them as souvenirs by the general public only dates from about 12 years ago, but today it is safe to say that there is no country in the world, under civilised influence, that has not its list of illustrated post-cards. Of the subjects treated pictures of buildings and monuments are most common, and some extremely interesting and quaint cards represent the peasant costumes of their respective localities. Prominent persons are another favourite theme, and a complete picture gallery of the Sovereigns of Europe can be gathered in this way. Political cartoon cards are numerous, some amusing ones having appeared illustrative of the Boer War. Each public event of importance also calls out a new card, as in Italy after the death of King Humbert an elaborate card was issued bearing the picture of Queen Margherita and the prayer offered by her at the time. It has been estimated by Dr. Hembo, one of the leading authorities on the subject of souvenir postals, that in France 88,000,000 cards pass through the post office annually, bringing to the Government 6,000,000 marks for postage. That country takes the lead of all others, Austria-Hungary coming next, with 31,000,000 cards mailed. In Italy there are 27,000,000 cards handled by the mails, and in England 14,000,000. Other countries, although falling below these figures, also number them by the millions. The total number put in circulation throughout the world in one year is said by experts to be 2,360,000,000, of which nearly half comes from Europe."

NEW Zealand Photographers and the Royal Visit.—Never in the history of photography in New Zealand has such an array of cameras been brought into action, says Sharland's "New Zealand Photographer," as upon the occasion of the visit of their Royal Highnesses the Duke and Duchess of Cornwall and York. "Every town graced by the Royal presence has done its utmost to give an enthusiastic welcome to such honoured guests, and to secure a permanent pictorial record of the Royal progress. For this purpose, we have dressed and decorated our wharves and shipping, and our streets and buildings, with a grand display of flags and banners, festoons and flowers; spanning our streets with beautiful arches, and hiding, as much as possible, all obtrusive deformities. Every possible opportunity for the use of the camera was seized by amateurs and professionals, and every 'coign of vantage' occupied by a protuding lens, behind which the dark cloth revealed the watchful presence of the ardent and expectant camerist. Long before the day of arrival places offering favourable positions had been secured, and the agents of the illustrated press were prompt in engaging all the assistance they could command, and in taking up the best stands, from which to secure the most likely snaps. Now that the great event has passed into history, we may, perhaps, learn a few lessons from the success or failure of those who have been most actively engaged in the

work. As the great majority of the camera men were restrained by the barriers and lines of guards from passing through the streets or approaching near the procession, they had consequently to take their places early in the day, with all the possible risk of unfavourable weather—while the representatives of the press, provided with their official pass, signed by the three great authorities, were free to come and go as they pleased. The stationary operator had before him but the one chance of securing a good exposure on the Prince and Princess, as they passed, while those who possessed the "open sesame" could go through the lines, and get as many chances of exposing as they might please to take. It is, therefore, very evident that in the photography of passing events—as in the collection and dissemination of general intelligence—the press is almost omnipotent. Ministers of State—and even Royalty itself—know full well the importance of publicity, and the power of the press, and they recognise the necessity of aiding both the photographer and the reporter as far as possible; granting to a chosen few the much coveted privilege of close attendance. The public also have come to look upon the pictorial supplement as giving the best description of a public function; for we all know how a few good photographs will tell a story much more completely than whole pages of letterpress. The eagerness with which the illustrated papers were bought up is at once an evidence of the necessity and importance of press photography; and the absence of all demand for actual photographs reveals the unprofitable nature of this branch of photography as a business, unless allied to the press. It is only a few years since that the photographer endeavoured to prevent the journalist from making a too liberal use of his prints, but now the position seems to be entirely changed."

Tanquerey in Australia.—"The exposure we gave to the unprincipled business methods of 'Tanquerey,' in the February and March numbers of the 'Journal,' was insufficient for some of our readers, who, we learn, were led by the fetching language of a letter-circular sent them," says our contemporary, the "Australian Photographic Journal," "to submit portraits in the hope of receiving an enlarged crayon drawing absolutely free, but instead of which they receive another printed circular requesting remittance of 20s., 24s., 28s., or 48s. being the proposed cost of a suitable frame for their picture. They wisely refuse to pay such absurd amounts, and communicate that decision to Tanquerey's office in France, and in reply receive still another printed letter, this time suggesting the purchase of a new style frame for 22s., said to be worth double the money, or if not agreeable to that, to send Post Office order for 10s., purported to cover the cost of boxing, packing, and carriage from Paris to their home, for what turns out to be a common third-rate enlargement touched over with ordinary chalk crayon, in our estimation, valued about two shillings, equal to badly spent labour only. In one instance we learn that freight charges to the amount of 13s. were demanded this end ere the picture was delivered, making a sum of 23s. for what is procurable in Sydney at 12s. 6d., with six cabinet portraits included, all infinitely better work. But this is not all we have to say about the 'Tanquerey' portrait. Enclosed along with one of the aforementioned letter-circulars is a pamphlet with a heading in bold type, 'The following testimonials from well-known people in Australia,' which by downright impudence, cheek and cheat, actually includes a testimonial as having come from the 'Australian Photographic Journal,' which we declare to be an invented falsehood used to delude the public; neither communication nor authority for such having been given by any one in this office."

The Strauss Studio at St. Louis.—When the Strauss studio was destroyed by fire the people of St. Louis were deeply grieved, for it was the most artistic interior in the town, and a place to take visitors to the city who loved art. The beautiful exterior of the building was not marred by the flames. It has been for some time a graceful ruin on Franklin-avenue, near Grand. But the Strauss studio rose from its ruins, and under the genius of the place, rose more beautiful than before. Ever since the fire, the artist-owner had been planning and rebuilding. He has planned well, as an artist, as a modern artist, as one who harmonises use and beauty. It is a place to remind one of the suggestion, in Swinburne's "Dedication" of Burne Jones's palace of paintings. It is the most beautiful photographic studio in the world, and the best equipped for the practice of the photographic art. You enter a circular vestibule in dark red picked out in figures of golden nail-heads, and move thence into a spacious apartment of ivory walls, the eburnean effect being singularly rich under the delicate lighting from the stained glass windows. A massive electrolier of burnished iron hangs in the centre with splendid effect. This fine reception room is ornamented with a series of panel pictures by Stoddart, in an upper, generous border. These panels are highly decorative, aptly to the height at which they are placed. The central panel is a beautiful figure of "Spring," filled with young, new, soft colour, and posed in an attitude of quiet delight, with flowers in her hand. On either side are more imposing, though not more beautiful, canvasses. They represent Spring, Summer, and Autumn in the double aspect of the season's work and creation. They are soft in tone, but extremely effective. The figure of "Summer" is rich and luscious and warm, and just sufficiently languid to convey the spirit of the season. We see in the panels on the one hand the farmer lad and lass, the sheep, and the toiler homeward wending his way, with wife at side. Again we see the youth leaving his boat to greet a summer girl. Again, we have a mellow autumn field scene filled with golden light and the richness of harvest. Over a mantel is a panel by Harney, called "Up in Pike County," reminiscent in a way of Verbeckhœven, though of a free and fine quality of treatment, especially of the poultry, for the painting of which Harney is noted. The whole display of pictures is eminently fitted to the setting in which they are placed. Passing the elegantly appointed office enclosure we reach the display room, lighted, and plenteously lighted, from the top, the walls lined in a red, soft velours so dark as to be almost black, and to give one the impression of stepping from a room of ivory into one of velvet ebony. Here hang the chef d'œuvres of Strauss' wonderful work with the camera, and pastels and other work in which he has long excelled beyond all competition. Up a stairway to the left, then over a balcony, affording a fine view of both reception room and the display gallery or salon, we come upon a gallery of Immortals—the remarkable display of the speaking likenesses of all the distinguished men in St. Louis in all lines of endeavour. Thence, we step into a sort of round-tower room, also in the richest of rich red, where are displayed the photographs only of the most eligible bachelors of St. Louis. Back we go to the south, and then observe a music room with tapestry walls of soft mellow hue, lighted with little electric bulbs around the ceiling, and provided with sumptuous lounges and a grand piano. Up a stairway we go to the right into a sort of second reception hall, or ante-room, to the artist's workshop, this room containing the overflow of the Immortals, and decorated in a rich striped tapestry. Off this room are the dressing-rooms for ladies and gentlemen, each in a different colour, all of the softest tone of woven wall colouring. These rooms are veritable gems of graceful ornamentation and comfort. The workshop is at the top—a commodious room with massive rafters of ebon black, and all the rafters, angling down to the side beams, finished off with splendidly carved faces that represent all the races, all the nationalities, and a multitude of emotions. These grostesqueries are most interesting, as is likewise the massive fireplace surrounded by a gigantic rosewood cabinet, with each apartment filled with miscellaneous curios and bijouterie. Off this is the wizard's den, the room where Strauss works out the ideas that he puts into his photographic work. Here are fine mural paintings by Howe and Cornoyer, and other artists, in varying lines—the result, a strongly electric grouping of pictures, but withal a most interesting exhibit. The workshop, moreover, is interesting for the lighting of it. The room can be drenched in light from above, for the roof is wholly glass, or it can be made as dim as the promise of dawn or the last gleam of evening by a singularly effective arrangement of shades. The workshop has a world of room. It is a place in which one is relieved from constraint—a great desideratum in sitters. The mounting room, the retouching room, where there is facility for handling thousands of plates, the catacombs, where are stored the negatives of 50,000 persons who have been photographed by Strauss, are interesting features of the great establishment. But no description can give any adequate idea of the effects produced by Strauss' combination of colours, his disposition of paintings and vases and statues, all without crowding, without impeding the work of the place, without appearing in the least to have striven for decoration. The entire arrangement of the restored studio is an eloquent evidence that Strauss is a veritable genius in the matter of artistic expression, in architecture, and decoration, not less than in photography. When the Strauss studio opened, and the master artist moved back from his quarters in the Y.M.C.A. building, St. Louis saw the most splendid palace in the city, and the sight was in itself an æsthetic education. It is the intention of Mr. Strauss later to build on the space now occupied by a large yard in the rear of the studio a great herbarium in which, if patrons so wish, photographs may be taken amid plants and shrubs, and to the ripple and tinkle of fountains. This will permit of nature effects in portrait photography that will be infinitely beyond the devices now employed of paper screens and papier-mache rocks. The gallery will open directly into this beautiful garden, and without doubt the place will be unlike anything ever known before in connection with a photographic studio. The arrangements throughout the Strauss establishment are such as to facilitate the rapid transaction of business. There are house telephones in every room in the place, and electric annunciators between all departments. An unique arrangement, never seen in the West before, for the storing of handsome picture frames, without taking up too much room, has been erected in a rear apartment, and is hardly noticeable, so well does it utilise the space of a small closet to accommodate quite large bulk. Astonishing, indeed, is the business done at a studio like Strauss'. There are whole rooms stored with cardboard, with tissue-paper envelopes, with mailing paper-boards, with little knick-knackeries that one wouldn't think ever came into use in such a way. It is really a surprise to get behind the scenes and see the beauty of the business organization of the place, and realise what a magnificent commercial undertaking it is to be photographer par excellence to the discerning folk of the great West. The building itself is one which would command the interest of the artistic people of any city, an object lesson of beautiful arrangement and adornment, as well as of perfect fitness for its purposes. The interior is one of the show places of the city—as much as Forest Park or Shaw's Garden. The place is the working home of a man at the head of his profession the world over. Strauss' work in photography has raised that occupation from mere mechanical artisanism to artistry—has made it the revealer of character in the sitter, and the expression of the man behind the camera. The most noted photographers of other cities deemed the reopening an event of enough importance to travel all the way to this city to participate in the dedication. They came to pay a tribute of respect to Mr. Strauss' art work, and to his business ability and success. It was an honest testimonial of appreciation from rivals. But the organs of publicity here, which one would think should be glad to note the completion of such a beautiful structure, and to felicitate such a man on his achievement in his art, and to encourage such an encourager of the æsthetic in local life, did not give him the recognition he so richly merits. Mr. Strauss and a few men of his progress and spirit and originality, are worthy of all the approval that might be bestowed upon them, for they are the men who keep the city alive in the thoughts of the artistic.—W. M. Reedy in the "Chaperone Magazine."

News and Notes.

THE Patent Office Library.—Those of our readers who live in London, or are often called there by business, will be interested to know that No. 6 of the Patent Office Library series is a catalogue of works on chemistry and chemical technology. Our late honoured predecessor, Mr. J. Traill Taylor, spent many hours in this library in its former home; its quiet and convenient reading room, and its easily available wealth of works of reference, he found most useful.

THE Famous Gainsborough Once More.—One is inclined to speculate as to when we shall hear the last of Gainsborough's "Georgina, Duchess of Devonshire." We are, most of us, familiar with the fact that shortly after it was purchased by Messrs. Agnew and Sons doubts were raised as to its being a genuine Gainsborough, and that soon after it was mysteriously stolen from their galleries, and recovered again in a rather singular way some little while back. Also that it was recently purchased by Mr. Pierpont Morgan for £20,000. Now a report has been "going the round" that the "real picture" is in the possession of the keeper of a common lodging-house at Brentford, who claims that it is the genuine picture—the one that was stolen—and that when he reveals the secret of his picture it will at once be declared to be the original. Possibly (?) Mr. Pierpont Morgan will purchase this picture also, so as to ensure having the original out of the two. We are all aware that this is the "silly season," and the time when the dailies abound in canards of various kinds.

CONTINENTAL Kodakers.—The Americans swarm in Switzerland this year, writes Mr. G. R. Sims in the "Referee." The American language overpowers all the other tongues of Babel in the railway stations and the hotel courtyards. And nearly all the Americans are now armed with Kodaks. I leant over the bear-pit at Berne one morning and watched a young bear eating an umbrella, and I discovered that no fewer than forty Kodaks were directed at him, and they were all in American hands. The principal food sold for the bears at an adjacent stall is a bunch of carrots. You buy your bunch and then fling it, carrot by carrot, to the bears, who assume deferential and expectant attitudes. Now each American lady Kodaker was accompanied by a brother or sister, whose duty it was to tempt the bears into good photographic positions by dangling a carrot over the side of the pit. So there were forty Kodakers and forty carrot-holders all round the pit at the same time. The effect was so ludicrous that I wanted a Kodak myself—not to snap-shot the bears, but the artists.

DRY Plates for the Indian Market.—The following hint to dry-plate manufacturers appears in the last number of the "Journal" of the Photographic Society of India:—"I read in the home photographic literature of films which are now made that are desirable from every point of view, but we in the Far East do not get the opportunity of seeing or trying them, as dealers here are afraid (and perhaps very justly) from going in for them. Does it not occur to home manufacturers, who of necessity must send round samples, that if they sent some to our Society for trial, it might be the means of drawing orders from this part of the world? I will now turn my attention to 'J. C.'s' statement about plates. I also for years past have used Wratten's plates with most pleasing results, and they have never failed me at any time of the year, but I cannot agree that others equally suitable are not likewise sent out; the Ilford have never played me false; of course, we have a variety of brands to choose from, but the majority of these, although they give us lovely negatives at home, will not stand the temperature of the solutions here, but frill badly, and in the major number of cases dissolve."

THE Lunar "Sea of Clouds."—An enlarged photograph of a mountainous and much disturbed portion of the moon, in "Knowledge," shows clearly many interesting details in the "Sea of Clouds," "whose floor," says Mr. E. W. Maunder, in an explanatory article, "presents a study of walled and ringed plains, in all states of preservation and decay. Bullialdus, the greatest and deepest of those on the floor of the sea, seems also to be of the most recent date, and from its south-west border there comes a curved chain of four craters, Bullialdus A, B, C, and Agatharchides A, the largest craters in the Mare. . . About half-way between Bullialdus and Gueriké, and slightly inclined to the meridian, is seen a chain of three or more ringed plains far advanced in ruin. At least the photograph presents them almost unmistakably as ringed plains, but Neison in his 'Moon' figures only the most northern member of the chain as such, not perceiving the western or separating walls of the more southern. At the north-east and south-west corners of the central plain, where it cuts the outer members of the chain, are two craters of comparatively recent origin, and a straight rill unites the two, and is tangential to their north-western flanks. We seem here to see the cause of the ruin and semi-obliteration of the ringed plains in the conjunction of rill and crater, both signs of weakness in the lunar crust, and causing subsidence on one side and upheaval on another."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
12.....	Hull	Excursion: Welton.
14.....	Ashton-under-Lyne.....	Excursion: Alton Towers. Leader, Dr. A. Hamilton.
14.....	Croydon Microscopical	Excursion: Fungus Foray. Conductor, Dr. Franklin Parsons.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 29,—Mr. S. Herbert Fry in the chair.

Mr. A. L. Henderson, referring again to the negatives shown last week that were covered with red spots, said that Mr. A. J. Brown had succeeded in removing the spots, but there remained clear spots in their places. Mr. Henderson had succeeded in getting rid of the spots altogether, but there appeared to be some risk about the process, and one might fail or succeed. If the red spots penetrated right through the film one might reduce them to a satisfactory printing density, but further action would produce a clear spot.

Mr. A. J. Brown said that he soaked off the varnish from the negative, and found that the image had not been properly fixed. He therefore fixed the plate again, and during one or both of the operations the colour left the spots. In the print of the negative the spots could only be seen after close investigation.

Mr. Henderson, who was always most careful about the proper fixing of his plates and prints, was not willing to believe that the negative was imperfectly fixed. He suggested that, were such the case, in twelve years, the time that had elapsed since the negative was made, imperfect fixing would have made itself evident.

Mr. Brown (continuing) said he might be wrong. It was true that the spirit he used in removing the varnish was not quite clean. It had been used for a variety of purposes, and perhaps it was to something taken up by the spirit that the removal of the spots was due.

Mr. A. Haddon showed a negative he had treated for Mr. Henderson. The red spots had gone, and there was no diminution of density where they occurred—at least, it was imperceptible.

Mr. J. S. Teape said that he had halved the negative he took away, and divided one half into three portions, each of which was treated differently. The spots in each case were dispelled, but the condition of the negative was best preserved in the second case, and accordingly the second half of the plate was treated like it. The print he passed round showed very clearly the degree of action upon the plate, but the method followed was not disclosed.

Mr. Haddon attributed the spots to silver staining.

Mr. Henderson took up another matter also referred to last week. A statement was made which he understood to imply that, in developing, one could not reduce the whole of the silver right through the plate. He had taken three plates and exposed them for different times through a sensitometer tablet. They had not been fixed, but after washing had been dried in the light. In consequence they had been spoiled as conclusive tests, but even then, he said, it could be seen that the image was developed right through, and that there was nothing to fix in some parts at all. The plates were slow chloride plates, and a lot of restrainer was used in development, which was prolonged.

Mr. A. Mackie asked whether, if the plates were fixed, Mr. Henderson would expect to get negatives of fairly correct gradation? He was not convinced, on looking at the plates, and asked that he might take them for experiment.

The Chairman said that in some trials of a self-toning paper he had come to the conclusion that the colour ultimately obtained was not more "warm" or more "toned" than might easily be accounted for by the modification of the vehicle containing the silver salt. For instance, matt paper and glossy paper would not go the same colour. The paper he had was matt, and it was probably this fact that influenced the ultimate colour a trifle.

Mr. Henderson said that all matt papers, especially if not gelatine or collodion, but a plain salted paper, required less toning than glossy papers, some wanted little or none at all. The stronger the vehicle the more difficult it was to tone. He referred also to a man who used to put gold into his paper in the sensitising, and said that his prints were famed for their fine tones.

Mr. Henderson then showed a brass music stand that he had converted into a camera stand for work in crowds, or places where some function might be inaccessible from the ordinary level. The upright had been lengthened, and a universal jointed head attached to the top of the inner sliding tube. To this the camera was attached and run up, the exposure being made by means of a bulb in the hand. Fears were expressed that the stand would never cease to vibrate even in a slight breeze.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BACKING PLATES.

To the EDITORS.

GENTLEMEN,—I always read THE BRITISH JOURNAL OF PHOTOGRAPHY with great interest, and the different remarks on backing of plates, etc. I have not found any difference in them as regards sensitiveness, but found a great difference in them when different backing is used to prevent halation. A certain manufacturer of plates uses a brown backing. This I found very good for the purpose, however, not always a perfect cure. I have lately used another brand of plates, which were backed

with a black stuff, probably Indian ink. This I must say I found no cure at all, as I had as good, if not better, results with unbacked plates than with such which were blackened on the back. Another trouble I found, and that has not been cured so far, on backed plates, nor even explained. However, it has been noticed by other parties, too, and on different makes of plates. That is the halo surrounding all subjects, and specially the darker ones on the resulting prints. This halo extends about one-sixteenth of an inch all around the lines, and however little seen on the original negatives, shows very strongly and rather bad on an enlargement of same. I must say that the first appearance of this trouble showed itself, with me at least, about six years ago, and I never noticed it before, but very often now. What is the cause of this? I have now become a strong believer in slow development, and if the resulting negative is rather hard, I find that I can get much more detail out in the shadows without hurting too much the high lights than by usual rapid development. This does not cure the halo I speak about above, but I have found another trouble worth while noticing I think. I took a photograph of a lady with a dark dress on. On both sides of the waist of her ran a white line about a foot wide along the wall. Upon slow development in a basin where the figure was in a horizontal position, and the white border upright, the white lines came out very well and black on both sides of the figure, but the waist of the lady between these two lines showed decidedly less development than in other parts of the dress, which leads one to believe that during the development a constant current of the liquid goes on in the basin, or some of it, touching the plate, drops downward, and is replaced by some above, as the line is shaded on the dress, less development above than below. The same remark is made near a white collar of a baby's portrait, and in much stronger contrast, the white of the collar being pure white as compared with the wall.—I am, yours, &c., A. Levy.

Asnières (Seine), September 3, 1901.

THE TEB COMPETITIONS.

To the Editors.

Gentlemen,—Our attention has been drawn to the fact that some amateurs object to their prints being kept by us in this competition. Our reason, in the first instance, for stating that they would not be returned was that we were anxious to avoid the enormous amount of extra labour it would entail; but sooner than the competitors should feel aggrieved in this matter, we have decided to return all prints, except those of the prize winners, if stamped addressed envelopes accompany the pictures.

We should feel obliged if you will would kindly insert the above in the pages of your valuable Journal.—We are, yours, &c.,

Chas. Tyler and England Bros.

79, Copenhagen-street, Caledonian-road, King's Cross, August 31.

OWNER WANTED FOR A LENS.

To the Editors.

Gentlemen,—Some unfortunate photographer has lost a lens, and it has been picked up by my boy, who was playing on St. Paul's Cray Common a few days ago.

Perhaps you will be good enough to make this known through your columns, and upon identification I shall have great pleasure in handing it over to the owner.—I am, yours, &c., Fred. J. Francis.

Benniworth, Sidcup, Kent, September 2, 1901.

THE METRIC SYSTEM.

To the Editors.

Gentlemen,—Whilst a discussion on the above subject is afoot, may I ask how it is that, according to The British Journal Almanac, page 583, a fluid ounce is said to equal 28.4123 c. c.?

If one c. c. of water=one gramme=15.4323564 grains, then 437.5÷ this number of grains gives the c. c. equivalent of a fluid ounce, i.e., 28.349 c. c., which is about a sixteenth of a c. c. less than the tabulated figures.

One has to gauge the importance of this by the fundamental correlation of the gramme and c. c. in the metric system, which, of course, must be maintained in the English equivalents.—I am, yours, &c., J. D.

SEASIDE CAMP FOR LONDON WORKING BOYS.

To the Editors.

Gentlemen,—"London is empty" is an oft-quoted phrase, and equally so the rejoinder that there are still some few millions left, who are compelled to labour without intermission for their daily bread throughout the sultry days of summer.

It is for one section of this large army of workers that we wish to solicit the practical sympathy of your readers, namely, the London working boys.

With all his faults—and the London working boy has many—those whose work specially brings them in close touch with him find much to like and to admire in his character.

He is as fond of a holiday as his more fortunate brothers, but a goodly proportion of his earnings have to go week by week to the family exchequer, leaving but a small balance. Out of this he has to find clothing and all amusements, such as holidays, clubs for cricket, football, &c., and, although he is often accused of undue fondness for cigarettes or the gallery of the music hall, he is keen enough to lay out his money to the very best advantage.

To get leave for a holiday is a comparatively easy matter. Employers are ready and willing to grant it, but in most cases there is no pay during absence from the workshop.

Sometimes when the father is dead, or ill, or out of work, the boy's earnings cannot be spared even for a single week, and, so when the change would be of the greatest value, as well as a welcome break to the monotony of the daily life, the temptation has to be resisted; the many excursion bills and vivid pictures of the country published by the railway companies have to be passed by uncomplainingly (for the working lad seldom complains), but none the less with regret.

It is to help such boys that the Seaside Camp for London Working Boys was inaugurated some years ago, the subscribers enabling the boys to go at an almost nominal figure to the seaside for a week, with the added luxury of living under canvas a life of freedom which powerfully appeals to their imagination. Camped out in an unfrequented part of the coast where bathing, cricket, and football can be indulged in to their hearts' content, what wonder that those who go down return much better for the change, lamenting the speed with which the days have passed? The boys have to assist in the daily work of the camp. This, however, with the numbers who go, makes but a small inroad on their time, and they are free the greater part of the day to do what they like.

There must be many of your readers who are at this moment enjoying their own annual escape from the cares and fatigue of work, or have their holiday before or behind them. I most earnestly appeal to all such fortunate folk to spare something—if but a trifle—towards providing for these tired lads, who need it so badly, the change that they themselves have learnt how to value.

Contributions will be thankfully acknowledged by Mr. R. T. May, Assistant Secretary, Northumberland Chambers, Charing-cross, or may be paid direct to our bankers, Messrs. Cocks, Biddulph and Co., 43, Charing-cross.—I am, yours, &c.,

E. Abel Bloxam, Commandant and Secretary.

Northumberland Chambers, Charing-cross, London, W.C.

SUTTON-ON-SEA.

To the Editors.

Gentlemen,—The reader in search of a quiet seaside spot wherein to spend a holiday might do worse than try Sutton-on-Sea. It is quiet, undeniably so; there is no rugged and grand coast scenery, but there is good bathing, and the place is not without a few "bits" for the photographer, good enough to make pictures of, not to mention sky effects, which may be had in plenty. The free, Bohemian character of the place is delightful. One must go prepared to bathe and lounge and sleep and dream away the days; there is certainly a race every morning for the daily papers, but this is because the principle of the "early bird" applies, and after a day or two even this excitement becomes tiresome. There is a promenade or esplanade of uncertain date, where the ladies and the more swagger of the gentlemen indulge in a mild sort of church parade on Sundays, and a bandstand—the band plays when funds permit, and there is plenty of human nature, but none of the Hooligan element. For the rest, you have billiards and bowls, tennis and skittles, primitive hockey and cricket on the fine hard sands when the tide is low. On Sundays the women and a few of the men—eye'd with mingled wonder and envy by their fellows—go to church, what time the hardened and unregenerate being only unofficially conected with the church as (out) sidesmen lounge about the sands and esplanade, which, by the way, is in the immediate vicinity of the only two hotels in the place—at any rate they are usually there on the near approach of the legal time limit. Hunger and thirst are a feature of Sutton. Then the donkeys—clean of limb and sound of wind, capable of covering their four miles an hour with the best. A visitor caused a little excitement recently by bringing his own animal. It appears he possesed an old horse, a yellow-hided beast, which must have been a lineal descendent of the animal which carried D'Artagnan from Tarbes to Paris, and created so much sensation en route. and, in view of a few weeks' stay, traded him off for a donkey. It was a bold idea, and a decided success. There is no fish at Sutton to annoy the olfactory sense, merely a healthy smell of sea and foam and shells. As a change, one may "bike" a few miles inland and snap up pictures of harvesting,

quaint wayside cottages, and more than one picturesque little church, and, apropos of photographing, how times have changed! You want to refill your slides, your changing tent has been left at home, and there are always crusty people who won't lend their dark room. Well, at Sutton—little Sutton!—you will find a nice, clean and new chemist's shop, owned by Hall's Drug Company (there is only the one), and set up therein as prominent as Thornton and Pickard's at a Convention meeting, is a dark room, a roomy dark room, to the use of which photographers are made cordially welcome. Within walking distance of Sutton is Mablethorpe. They have a bit of ground set apart at this place for the donkeys, and there is a notice-board put up, "Stand for Asses." The joke is, of course, to arrange your friends hereabouts, and snap-shot them. This is at Mablethorpe, mind, and would not be thought of at Sutton.—I am, yours, &c.,

ESOX LUCIUS.

DEALERS AND PLATE-MAKERS.

To the EDITORS.

GENTLEMEN,—Will you allow us, through the medium of your valuable columns, to ventilate what we deem to be a matter affecting the interests of a large number of respectable firms, who have in the past done much to advance the welfare of manufacturers and photographers throughout the United Kingdom?

For many years it has been a custom with plate-makers when trading with dealers that, provided a dealer brought prominently under the notice of his customers the merit of a particular brand of plates in such a manner as to influence, or to become instrumental in causing his customer to adopt such plate in preference to others, the makers were in fairness bound to refrain from interfering with the dealer's interest as between him and his customer, and should refuse to trade direct with those photographers who had been introduced by the dealer.

It is with pleasure we place on record the fact that several of our plate-makers recognise the fairness of declining to trade direct with those photographers or firms who have been introduced to them by dealers. On the other hand, we regret extremely that some manufacturers, without any justification, have seen fit to break through a custom which has been recognised in the trade so long, and are now openly interfering with dealers' customers by trading direct.

We think that there can be no question that the photographic dealers of the United Kingdom have been the friends of the plate-makers all through recent years since dry plates have come to be so universally used; and, had it not been for the action of several large firms, whose travellers were regularly calling on every professional worker in the kingdom, the probability is that those makers who are now striving to introduce a method of trading foreign to this country, but which savours strongly of Western ideas, would never have found themselves in the position they occupy to-day. It is only those dealers who have had to face the many objections and complaints levelled against dry plates on the part of their customers, by reason of inferior quality and other shortcomings in their manufacture, who know how often, and to what an extent, they have suffered as between maker and consumer, the dealer often incurring serious loss, which was never recoverable from the maker. Against all this uphill pulling, they have struggled to make business as between maker and consumer, business which, had it not been for the dealer, would never have been entered into; and it is poor return for such to find a certain class of makers now endeavouring to cut the ground from under the dealers who have done so much for the makers generally.

When a dealer has pushed a certain plate, and procured orders from, say, upwards of twenty of his best customers for the same, it is not very encouraging to them or their travellers when going on their next journey to find they have been forestalled by a representative direct from the plate-maker, who unblushingly ignores the fact that, had it not been for the dealer's influence, or that of his traveller, their plates, in all probability, would have had no sale in that locality.

We have also been made aware of cases in the North of Scotland where a plate-maker is allowing a larger discount than is permitted by the Plate-makers' Association. This being the case, is it any wonder that dealers are found cutting prices where their customers are being tampered with by the very parties that have made the rule they are the first to break?

Quite recently the ventilation in public of what was almost universally condemned as a high-handed proceeding on the part of a leading firm of manufacturers of photographic apparatus and material, tended to bring about a better understanding between them and the dealers of the United Kingdom; and it is in the hope that a remedy may be found for what, in a sense, is a similar interference with the dealers' interests that we bring this matter before the notice of the photographic dealers and public generally.

In so far as the photographers' interests are concerned, the dealer will, in every instance, give the same discount and other equally favourable terms, as regards payment of carriage, as the plate-maker will do. So far as we are aware, this action has not been courted by the photographers of the United Kingdom, between whom and the dealers there has always been the best understanding in trading, but has emanated from a small coterie of plate-makers.—We are, yours, &c.,

GEORGE MASON AND CO.

Glasgow, August 26, 1901.

THE KEEPING QUALITIES OF NEGATIVES.

To the EDITORS.

GENTLEMEN,—It is pleasant, through the medium of your valuable paper, to converse with our brethren of the camera. It is some weeks since I wrote on the subject—on the difference of keeping qualities of the old collodion versus the gelatine negative. Since then I have looked up, and send for your inspection, some waxed paper negatives taken by Dr. Diamond in the fifties, and I think you will agree with me that in these, as in both the other kinds of negatives referred to, the retention of the silver image depends very largely on the conditions under which they are kept. Now, most of the collodion ones, dating from the earliest of collodion work down to the adoption of gelatine, were kept in grooved boxes, such as was more generally in vogue in the early days, while the gelatine ones have been kept, on account of their tougher structure, if I may so term it, either in paper envelopes, resting one against the other, or in many cases without envelopes. Now you will notice in some of the waxed paper negatives spots such as are caused by the dampness of paper long kept closed, as these were kept between the leaves of a book, and my impression is that spots of a similar kind have been often produced on unvarnished gelatine negatives when stored in paper envelopes laid together as I have described, and it is to this hygroscopic character of gelatine that may be traced a good deal of sundry deteriorations in dry-plate negatives, and hence they need more careful storing. My experience teaches me that, if carefully produced at starting, properly varnished, and carefully stored, the silver image is retained, as well as in the old collodion, and I do not think too much stress can be laid on varnishing, for even if the negatives are stored without any intervening paper, yet in the varying degrees of temperature to which most photo negatives are exposed, there is almost sure to be damp engendered by condensation on their surfaces, especially in the colder weather, when there are fires in the printing department, and the negatives get shifted from any cause. The question of storage therefore, next to varnishing, seems to be most important to preservation. The old method of grooved boxes, with its somewhat large demand for space, seems to be the most conducive thereto. I have some so kept for many years that compare very favourably in proportion to their age with their older brethren of the collodion type; but even here some precautions are needful, for should the box, say, of 50 or 100, be opened in a very warm room on a winter's day the whole would probably be almost immediately covered with damp through condensation. Now, if the box be closed again very soon, a large portion of the damp will remain on them, whereas if left open for an hour or so the whole would dry off by equalisation. It resolves itself, therefore, into this, that if you wish to preserve sets of valuable negatives you must exercise discretion in their use and storage; it must not be supposed by any one who has had no experience with collodion that they would not suffer by condensation although varnished. I have seen some absolutely ruined thereby, the damp apparently swelling the varnish, which in its turn has lifted the collodion off the plate, and when dry the whole has refused to revert to its former dimensions. I am aware that much can be said against the grooved box plan, so I venture only to give the result of observation, hoping only it may lead to the further ventilation of the subject, which must be of interest to all who wish to preserve their negatives. I may say, however, that I believe the storage between leaves of a book is most injurious to gelatine plates or films; in fact, negatives where gelatine plays any part. I have some negatives produced on stripping films which have been removed from their glass support for process work that have become quite spoilt by being so kept. Kindly return me the waxed paper negatives when you have examined them. It may interest your readers if you comment on them. They have some historical interest on account of their producer, associated as he was in the earliest days with the Royal Photographic Society.—I am, yours, &c.,

OLD PROFESSIONAL.

[We are very much obliged to our correspondent for permitting us to examine the waxed paper negatives by the late Dr. Hugh Diamond, F.S.A., a once prominent worker in photography. With the exception of the spots referred to, which in most cases are not visible on the image surfaces, and are, perhaps, not dense enough to seriously interfere with printing, the negatives, after nearly half a century's existence, are in an excellent state of preservation, whilst qualitatively speaking (and representing as they do views at Eastbourne, Shoreham, &c.), they would not suffer by comparison with results obtained by skilful amateurs of the present day. The negatives have been returned as requested.—EDS. B. J. P.]

COSMOS AND "CAROLLING."

To the EDITORS.

GENTLEMEN,—Although "Cosmos," to me, is a nebulous personality, it may never be my good fortune to know definitely, yet there is, here and there, in his "Jottings" the "touch of nature" that makes us kin. His reference to Sir John Suckling bespeaks an acquaintance with the Elizabethan writers (and I know of no more delightful companions for such a holiday as "Cosmos" has been rejuvenating himself with—except perhaps a pair of binoculars!) that bespeaks a goodly taste in literature. Hence I feel sure that he will not resent my setting him right with reference to the authorship of the lines H. P. Robinson chose for the title of his picture. In "As You Like It," act v., scene iii., is a song, "It was a Lover and his Lass," the third verse of which runs:—

"This carol they began that hour,
With a hey, and a ho, and a hey nonino,
How that life was but a flower
In the spring time."

Now, Shakespeare's "As You Like It" was first published in the folio of 1623, at which time Sir John Suckling would be about ten years of age (he was born in 1613), consequently if the lines exist in Sir John's writings (and I have no copy with me to which to refer), they must, consciously or unconsciously, be a plagiarism.—I am, yours, &c., G. T. HARRIS.

Menai Bridge, North Wales, August 31, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. A. Stelling, 60, Peckham-road, S.E. *Photograph of the Rev. A. Adams.*
G. Sandy, 2, Railway-street, Stafford. *Photograph of Mr. Thompson Sharp.*

INQUIRER.—It is the usual rate, as the insurance offices imagine that a photographer still uses collodion, ether, and other inflammables.

THIN NEGATIVES.—T. BIGGS.—From your description we should say the plates are much under-exposed. If you will send us one or two to see we shall be able to say definitely.

MOUNTING BOARDS.—A. MICHAELSEN asks: "Will you kindly tell me where I can get the art-boards for mounting photos mentioned by Richard Thirsk in his article on the permanent mounting of prints (ALMANAC, 1900, page 767)?—In reply: Boards suitable for the purpose may be obtained of any of the large stock houses, such as Marion's, Houghton's &c.

QUICK PRINTING MACHINE.—"BROMIDE" writes: "I have to produce a large number of bromide prints at a cheap rate, and find it wastes time in filling in the frame for each print. I am told there is a machine sold for this kind of work. Can you tell me where it is to be had, and its price?"—In reply: Messrs. Marion and Co., 22, Soho-square, will supply such a machine. Its price, if we remember rightly, is £5.

SALARY—IN BANKRUPTCY.—"L. Y. X." says: "I was engaged here at a yearly salary, and was paid monthly. Now the concern has become bankrupt, owing me a month's salary. The liquidator says I must take so much in the pound, the same as the other creditors have to do. I am told, however, that servants should be paid in full. Can you please tell me if this is correct?"—In reply: Yes, you must be paid your salary in full, whatever composition the other creditors have to take.

VALUE OF LENS.—C. BENSON says: "I have recently bought, amongst a lot of photographic apparatus, a portrait lens. It is three-and-a-half inches, nearly, in diameter, and bears the name of 'Mangey Ainé, Paris.' Can you tell me what size picture it will take, and its value?"—In reply: It is probably one of the old firm of whole-plate lenses. It has very little present market value, though it may be a very good instrument. Mangey at one time was considered a good maker. That is all we can say.

COPYRIGHT.—G. R. W. says: "Can you tell me if there is any copyright in this country in the copies of paintings that are made on the Continent, and sold in such large quantities here, and whether I should run any risk in copying them for sale in this country?"—In reply: You may depend upon it they are copyrighted in the country in which they are published, and, under the International Copyright Convention, they are copyright here. You certainly would incur great risk in reproducing any of them.

W. HARRISON.—The quantity of gelatine should be 87½ grains of Nelson's and 87½ of Coignet, if you use the English weights and measures; if the metric, then it should be 40 grammes of each. You can increase the gelatine if you like, but it will not improve matters.

LENS QUERIES.—A. B.—(1) It is quite against our rule to express opinions on the relative merits of different makers' instruments. We may, however, say that both of the two named are good, and suitable for studio work. (2) Yes, if both be worked with apertures of the same ratios. (3) The shorter focus one would. (4) The modern aplanat has a flatter field and more even illumination than the older forms of wide-angle lenses. Used with the same apertures, the rapidity would be the same.

LEARNING PHOTOGRAPHY.—"SCOTLAND" says: "I should feel obliged if you would answer the following questions:—(1) I want to know if a sharp well-educated youth can learn the art of a photographer in four years? (2) State the order of learning the art. (3) How long should be devoted to each subject? The class of trade is good—plat., carbon, silver, &c.? (4) Mention time that should be occupied in retouching and operating in studio and outside."—In reply: (1) Yes, he ought to be able to do so. (2) There is no particular order. Printing and toning are usually taught first, and retouching afterwards. (3) Until the pupil gains proficiency in each subject. He may gain it quicker in one branch than he may in another. (4) This query is really answered by No. 3. All must depend upon the pupil himself.

CARBON PRINTS ON IVORY.—S. F. says: "I shall feel deeply indebted to you if you will explain how to print carbon prints on ivory for miniature painting? What tissue to buy? What is the best temporary support to use—slow preferred? How is the ivory prepared, &c.? After the print is on the temporary support, how long is it to remain before transferring? I tried the above some time ago, but I could not get the print to adhere to the ivory."—In reply: Any colour tissue, according to taste, may be used. Develop the print on any of the ordinary flexible supports in the usual way, and allow it to dry. When dry immerse it, together with the ivory, in a weak solution of gelatine, to which a little chrome alum has been added, and remove the two in contact (avoiding air bubbles), and then squeegee together. When dry, strip off the support. If you are not conversant with carbon printing, we should advise you to get the "Autotype Manual." In that you will find full details for transferring carbon prints to ivory, as well as to other substances.

STAINED PRINTS.—"TROUBLED" says: "I should feel obliged if you could give me your opinion as to the cause of these yellow stains on matt collodio-chloride prints through the medium of your JOURNAL? These prints are only ten weeks old, they have been carefully washed, &c., and I cannot understand the cause of these stains. It looks as if some chemical action had set up, and it appears to be eating away the print. They have not even been exposed to the light. I am also troubled with silver prints showing yellow stains, also as if it had been scorched. I send you a print, but the action only takes place after being exposed to the light for a time. I have found a great many of them go like print shown, especially in large prints, like 12×10 and 15×12, and, strange to say, these large prints are hand washed, and very carefully."—In reply: The yellowness appears to be due to the prints being insufficiently fixed—that is, they were not allowed a sufficient time in the fixing bath to convert the hypo silver salts into the soluble form, so that they could be removed from the paper in the washing.

LANTERN QUERIES.—"PHOTOPHIL" says: "(1) On page 349 of THE BRITISH JOURNAL OF PHOTOGRAPHY, May 31, 1901, a magnesia cylinder is mentioned as a substitute for lime. I should much like to know more about such cylinders, and where they may be had? I had understood that they were less luminous than lime, but emitted more violet or ultra-violet radiations, and so might be useful in some spectrum experiments, &c. I tried making some magnesia cylinders with gum water, or fluorate, but they splintered under the oxyhydrogen flame. (2) I much desire to know of a solution, or liquid, which (a) absorbs little or no carbonic acid, (b) is non-inflammable, non-explosive, and (c) cheap? (3) I have seen on one occasion a lantern display given by transparence on a screen which somewhat resembled in appearance tracing paper yellowed by age; it presented no seams. Though, doubtless the colour was a disadvantage, it had the great merit of allowing no rays to pass unimpeded through it from the lantern, i.e., there was no direct central glare from the objectives, as there is in sheeting, which is doubtless due to light passing unobstructed and direct from the lenses through the interstices of the textile screen. Now, in many theatres it is much more convenient to work by transparence, and, accordingly, I should be very grateful for information about the material in question."—In reply: (1) We are unable to say who was the maker of the lime cylinder used on the occasion. If you write to the Hon. Lanternist, Mr. S. Heskins, London and Provincial Photographic Association, White Swan Hotel, Tudor-street, E.C., he will doubtless give you the desired information. (3) We answered this query for you in the issue of August 23. (3) We are sorry we cannot say where a material answering the description is to be obtained.

*** Several answers to correspondents, editorial table, patent news, and other matter are unavoidably held over till next week.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 2158. Vol. XLVIII.—SEPTEMBER 13, 1901.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

The R.P.S. Exhibition. Autumn has come again, and the chief event of the photographic world, at home or abroad, is once more in sight. We allude, of course, to the Annual Exhibition of the Royal Photographic Society, which this year will be held for the forty-sixth time. The exhibition, which is the second of the series to be housed in the New Gallery, 121, Regent-street, London, W., opens to the public on Monday, September 30, and closes on Saturday, November 2. We are pleased to learn that the number of exhibits submitted for selection is larger than hitherto, and in particular that the Professional Section, the creation of which we advocated for several years, has been very strongly supported. It is highly satisfactory to learn that there is every prospect of placing before the public a fortnight hence a display of photographs, not only large and representative, but typical of the best work which relies for its production upon the thoughtful application of modern photographic appliances. Enhanced prestige has attached to the exhibition in virtue of the fact that it is held in a place of such

renown as the New Gallery, and it is sincerely to be hoped that the efforts of the Society to attract a large attendance of interested visitors will meet with the utmost success. Last year's exhibition led to a favourable financial result, but the attendance—some ten or eleven thousand, we believe—cannot be regarded as satisfactory in view of the widespread interest which photography nowadays excites. We expect the annual attendance of the great non-photographic public, as it may be distinguished from regular exhibition goers. to shortly increase by thousands, for the central position and popularity of the New Gallery are bound to exert a magnetic influence upon the huge cultivated class, which the old room in Pall Mall East failed for obvious reasons to do.

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Some New Gallery Details. Profiting by the knowledge derived from last year's Exhibition, which was unavoidably somewhat experimental in nature, it will be found, we believe, that the Executive of the Society has introduced many improvements in detail at the New Gallery, which will promote the comfort and convenience of visitors, and allow the exhibits to be inspected to the best advantage. The policy of making the Exhibition attractive to the general public is a wise one. The judges this year are:—In the Pictorial Section: Dr. P. H. Emerson, Colonel J. Gale, Mr. G. A. Storey, A.R.A. Mr. F. M. Sutcliffe, and Mr. J. B. B. Wellington; and in the Technical Section, Mr. Chapman Jones, F.I.C., F.C.S., Mr. E. J. Wall, and Major-General Waterhouse, I.S.C. The eminence of such well-tried judges as Emerson, Gale, Sutcliffe, and Wellington should lend special value to their awards. Mr. Storey, according to our contemporary and neighbour, the "Morning Post," has been called in "as an artist to assist the photographers"! Of the technical judges, Mr. Wall, we believe, is new to the work, and we congratulate him on his accession to a post of honour, for which he is well qualified by knowledge and experience. The exhibition has our best wishes for its success, and we trust that its beneficial influences will be permanent and far-reaching. It is the duty of all those who take a sympathetic interest in photography to visit it, and we are of opinion that besides doing so himself every professional man should give his studio and work room staff the opportunity of studying the newest phases of photographic work at the New Gallery. We should not omit to mention that the private view of the Exhibition takes place on Saturday, September 28, and that in the evening there will be the usual conversazione. This is always a pleasing and well-attended reunion, and we anticipate that on this occasion the popular President of the Society, Mr. Thomas R. Dallmeyer, F.R.A.S., and Mrs. Dallmeyer, will have the agreeable task of welcoming several hundreds of visitors to the galleries.

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Hardwich's Collodion Making. Last week we made reference to recent work on the nitro-celluloses, and showed how a knowledge of the Rev. F. Hardwich's work and researches forty years ago in a somewhat similar direction would have facilitated the experiments by indicating a line of research, and providing an authoritative, trustworthy basis. We now purpose to redeem our promise of indicating a practical method of carrying out the working of a suitable nitro-cellulose for dissolving in ether and alcohol for photographic purposes. It will be best, first, to bring before our readers the results of Hardwich's various trials, and thus gradually lead up to what we may term his final formula. At the time referred to the usual mode of making what was then common called gun-cotton was to immerse the cotton in a mixture of sulphuric acid and nitrate of potassium, the nitric acid being liberated from the salt, and a nitro-sulphuric acid plus potassium sulphate produced. Hardwich showed that this method had disadvantages, and he abandoned it entirely, as the recent Continental experimenters have done. The important task lay before him of deciding upon the proportions of the mixed acids to one another (apart from the temperature and dilution with water factors). Briefly put, they were to the effect that smaller proportions of nitric acid produced a cotton which, made into solution, gave a collodion less mobile and giving less density of image when developed. Increasing the proportion of nitric acid produced a more fluid collodion giving greater density of the developed image. These conclusions were largely disguised by the conflicting indications brought about by differences in the temperature of the acids when the cotton was immersed, and by variations in the amount of water present, which might be expressed in another way by saying the strength of the acids employed. As regards temperature, he found that, up to a certain point, the higher the thermometer indicated the more fluid the collodion, and the more intense the image. But all these indications had to be carefully disentangled from those shown by variations in the proportion of water present. Extent of dilution he showed to be the prime factor governing the mechanical properties of cotton when made into collodion. Fortunately the lessons to be learnt here were so simple—after Hardwich pointed them out—that he who ran might read. This is what he predicted: the greater the amount of water present the greater the fluidity of the collodion produced from such pyroxyline; past a certain point an excess of water would lead to the whole of the cotton being disintegrated, and, finally, dissolved in the mixed acids. In the opposite direction the less the water present the less the disintegration, till, as the quantity of water was reduced, a nitro-cellulose was obtained, which was less and less soluble when, by further elimination of water, the point of insolubility in ether and alcohol was reached, and a real gun-cotton, highly explosive, was the result. We have thus put in a few sentences the result of continuous work over a long period.

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The Soluble Cotton. The next point to decide was the material to be made into pyroxyline, the substances at that time recommended being cotton-wool, flax, paper. Probably the latter had most adherents at the time, nitro-cellulose made by its aid being then called papyroxyline. Hardwich considered paper to be too uncertain in composition to permit of the manufacture of a uniform product, and hence he eliminated it from the trio. Flax, he thought, might possibly give a more mobile fluid, but he considered the balance of advantages lay with ordinary cotton-wool, and this was the form of cellulose he ultimately adopted. In his time specially prepared cotton-wools were not obtainable. He preferred a long-fibre cotton known as South Sea Island, and in regard to its use we find his close power of observation to come into play. He noticed that the cotton did not "take kindly" to the liquid, and required some time to become impregnated with the mixed acids. There would thus be in portions of the mass more chemical action than in others, heat would be developed, and an irregular product obtained.

He soon found a remedy. He concluded that the fibres were coated with a film of resin that repelled the liquid, and he got rid of the evil by boiling gently for two hours in a weak solution of caustic potash, well washing to get rid of every trace of alkali, and finally well drying. It was really marvellous to notice what an effect was produced by these means. Every one is familiar with the action of a sponge when put into water—a dry sponge takes many minutes to absorb all the water possible, but with a damp sponge the action is almost instantaneous. So it is with ordinary untreated cotton-wool, and alkali-treated wool as above. Nowadays, however, all this preliminary trouble may be avoided, for a wool known to the trade as absorbent can be purchased (at virtually the same price as ordinary kinds), this wool having been treated by superheated steam or otherwise in such a way as to enable it, when used for the purpose we are discussing, to suck up the liquid with the utmost avidity, quite discounting the necessity for Hardwich's practical and ingenious treatment. We shall return to this subject on future occasions.

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Nocturnal Photography at the Glasgow Exhibition.

Something like a craze has set in at the Glasgow Exhibition for what may be termed nocturnal photography. No doubt the exquisitely beautiful appearance of the exterior when lighted by means of hundreds of thousands of fairy and electric lamps has tempted many tourists, as well as residents in the west of Scotland, to endeavour to photograph a scene which, without exaggeration, is one of the most magnificent spectacles ever provided in this country. This scheme of illumination has been drafted on a colossal scale, and has been carried out in the most brilliant and effective manner at a cost of about four thousand pounds. It embraces the outlining of all the chief points in design of the industrial hall and the art palace. Myriads of tiny lamps are employed, which throw out their light with a brilliance that dazzles the eye, and, when viewed from any point in the grounds of the Exhibition, the main features of the building, with its domes and minarets, seem ablaze with gems of the most varied hues. To photograph this scene is the ambition of all photographers who have the good fortune to behold it, and at first sight to strangers visiting Glasgow, and who see the Exhibition during the day, it might appear a matter of no great difficulty to arrange a camera at some point on high ground facing the Exhibition; but within the Exhibition grounds, and on almost every other point that overlooks the park, vast crowds of surging humanity nightly take possession of the place. Hand cameras are quite out of the question, although, judging from the number that are nightly seen attempting something in the way of nocturnal scenes, it might be supposed they were as easy to photograph as a daylight scene, and tripods are not allowed within the grounds, even were it possible to use them in the crowds. Subjects of this description can only be photographed from well-selected standpoints, and any tourists going to Glasgow who desire to carry away with them some memento of the Exhibition as it appears after nightfall would do well to turn their attention to obtaining the use of some window outside the grounds of the Exhibition. One of the best positions is from the front of the University, permission to photograph from which, however, has to be obtained from the Principal. It is well known that the best results in this class of work are obtained by double exposure. This means so arranging matters as will permit of the plate being partially exposed on the scene just at the gloaming, so as to give a faint image of the building, and then, without moving the camera in the slightest degree, wait patiently until the full illumination is on, and briefly expose for the lights. Thickly coated plates that are well backed with bitumen should be employed. Bitumen dissolved in chloroform is a sure preventative against halation, and it should be used on a plate that is coated with a good thick emulsion, preferably isochromatic.

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The Camera Club.

The "Journal" of the Camera Club for September contains the following:—"Our readers will share the regret with which we announce the retirement of Mr. H. H. O'Farrell from the Hon. Secretaryship of the Camera Club, and from the editorship of the Club 'Journal.' Mr. O'Farrell undertook the double office in January last, at a time when the duties were particularly onerous, and has devoted to their discharge so large a measure of time and attention as merit, and will receive, the warmest thanks of his fellow members. He retains his seat at the Board, and will continue therefore to take part in the administration of the Club's affairs." We venture to add our testimony to the great value of Mr. O'Farrell's services to the Camera Club, and at the same time we are glad to have the opportunity of acknowledging many courtesies received at his hands. Mr. O'Farrell is succeeded in the Hon. Secretaryship of the Club by Mr. G. A. T. Middleton, A.R.I.B.A., whose name will be familiar to our readers as an accomplished writer and lecturer on architecture, and the photography thereof. To a by-no-means easy office Mr. Middleton brings the very valuable qualities of energy, tact, and urbanity, and we heartily wish him success in his work. The membership of the Club, we are glad to note, shows a steady increase. The name of the new Editor of the Club "Journal" has not been announced, but our confrère, it is evident, is a practised writer and a thoughtful photographer, for he prints in his first number several articles of very marked ability, from one of which, "Scale in Photography," we give a lengthy extract on another page. It is a well-reasoned plea for large direct photographic work at the exhibitions, a matter we have personally discussed and advocated with many of our readers during the last few months.

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Stereoscopic Photography.

Amongst the questions addressed to us this week was one which, though apparently simple, we found not so easy to answer off-hand. Our correspondent asked "the names of makers of stereoscopic transparencies." Only one name occurred to us, that of the veteran photographer, Mr. H. N. King, who, if we mistake not, stands alone in this beautiful branch of work. Commercially speaking, transparency making for the stereoscope appears in danger of becoming a lost art in the United Kingdom. This is much to be regretted, for it is generally conceded that photography yields few more beautiful manifestations of its powers than a carefully made binocular picture on glass. In our opinion there is great scope for the commercial exploitation of stereoscopic transparencies, and with energy and enterprise the business might be made remunerative. That stereography is still very popular with amateur photographers is undoubted. During our visit to Scotland last month one of the largest dealers there informed

us that this season his sales of stereoscopic apparatus formed a very considerable part indeed of his trade. Although it is only two years since we wrote at length on stereography [in the ALMANAC for 1900] there is such a general request for information on the subject that we propose to respond to the demand in these pages at an early date. Meanwhile, there reaches us as we write this paragraph the September number of the "Stereoscopic Photograph," published by Messrs. Underwood and Underwood of New York and London. This is a capital illustrated quarterly magazine devoted to popularising stereoscopic photographs with the public. The frontispiece consists of two at-home stereographs of President McKinley and Mrs. McKinley, and thus is possessed of the greatest interest at the present time. The President is seated at the head of his Council table at the White House, and the lady occupies a regal-looking chair. Of the kind we have not seen better stereographs than these, which are so good that they may well serve the photographer as models for imitation in binocular interior work. Above all, the centres are kept well under three inches, for the binocular effect "comes at once;" and we imagine that the camera objectives were mounted at similar distances, as the pictures appear quite natural and undistorted. Why do not some of our professional readers turn their attention to this branch of work?

REMOVING NEGATIVES FROM THE GLASS.

WE are frequently asked for information as to how to remove a negative from the plate on which it is supported, for the purpose of printing from the reverse side of it, so as to get a non-reversed image in some of the photo-mechanical or single transfer carbon processes. More often than not the information is required in the case of a cracked negative, where the film has to be removed from the broken glass and transferred to another and sound one. Although different methods, which leave little to be desired, have from time to time been fully described in these pages, still the query is continually being repeated. Therefore we shall once more deal with the subject, and describe different methods of doing the work, which, after all, is a very simple matter.

The removal of a gelatine film from its glass support does not entail nearly the delicate handling that a collodion one does; but, we imagine, few have the latter to deal with nowadays, therefore we shall only consider the former. We will take the case of a negative, the glass of which has been cracked, say, in the printing frame, in which case the film itself is seldom, if ever, broken through. The first thing to do is, with care, to place the negative, face upward, on a glass plate a size larger than itself, and it will be found convenient to firmly secure it there. This, however, is not at all necessary in careful and experienced hands. A simple way of fixing the negative is to put three or four touches of thick indiarubber solution on the back, and similar touches on the new glass, and, after they are dry, press the two in contact, when they will firmly adhere through the subsequent operations. If the negative has been varnished, the varnish must be first of all removed. Should it be a spirit varnish, as most likely it would be, the negative is put into a dish of strong methylated spirit for an hour or two, the dish being covered with a plate of glass to retard evaporation. With an hour or two's soaking the varnish will usually have become dissolved; if not, a few drops of ammonia may be added—which will aid solution—and the film rubbed over with a pledget of cotton-wool. When the varnish is all dissolved away the negative should be well rinsed with fresh spirit. If the negative has been varnished with a dammar varnish, benzol must be used as the solvent, in which case it may be applied with a pledget of cotton-wool. The varnish having been got off, the gelatine film is next hardened, unless it has been well alumed when the negative was first taken. Formaline is best for the purpose—about ten per cent. of the ordinary commercial formaline in water, with a ten minutes' immersion will suffice. The plate is then rinsed in water to remove the formaline, when it is ready for stripping.

It is a good plan, as will be explained later on, to dry the film at this stage, and then give it a thick coating of enamel collodion. This is best done by placing the plate on a levelling stand and pouring on as much collodion as the negative will hold without running off. It should then be allowed to rest undisturbed for an hour or so for the greater portions of the solvent to evaporate. The plate is then put into water and allowed to soak until all greasiness disappears. The film is next cut through to the glass, about the eighth of an inch from the margin, with a sharp penknife. The plate is then put into an ebonite, or xylonite, dish containing water, to which a few drops per ounce of hydrofluoric have been added. In a few minutes the film will be seen to loosen itself, and by gently rocking the dish it will become entirely detached from the glass. The detached film is then gently lifted out, on the glass, and put into fresh water to wash away the acid. A clean glass plate is then coated with a thin solution of gelatine and allowed to set firmly; it is then put into the dish, under the film, with its collodion side upward, which is then floated upon it and arranged in position, of course avoiding all air bubbles. The plate is then gently withdrawn, the film being held at one end the while and drained, and afterwards allowed to dry spontaneously.

We now have our negative finished with a thick film of collodion upon it. This can be removed, if desired, by treating it with a mixture of equal parts of ether and alcohol applied with a pledget of cotton-wool. We have here given the method of stripping with hydrofluoric acid, though this is an unpleasant material to work with, inasmuch as it cannot be stored in a glass bottle, or used in porcelain or glass dishes—lead, guttapercha, ebonite, or xylonite ones must be used. In place of the hydrofluoric acid the following, which was suggested by Mr. Thomas Bolas in the ALMANAC for 1895, may be employed, and it is far more pleasant to work with. The formula is this:—Sodium fluoride, sixty grains; sulphuric acid, one fluid drachm; water, one pint. In this solution the negative behaves in just the same way as it does in the hydrofluoric acid.

In place of the hydrofluoric acid hydrochloric may be substituted. Another method of loosening the film is to soak the negative in a solution of carbonate of soda until the film is thoroughly saturated with it; then, after slightly rinsing, it is put into water slightly acidified with sulphuric acid. The rationale of this method is that the acid liberates carbonic acid gas between the film and the glass, and so forces it away. On the whole, however, in practice, we prefer the hydrofluoric method as suggested by Mr. Bolas.

The object of coating the negative with collodion in the first instance, although it involves a little more trouble, is that when the film is detached it is more easily handled than

he unsupported gelatine film; and also for the reason that the gelatine has been insufficiently hardened, expansion is to a great extent avoided. Furthermore, when the collodion film (if the collodion is very thick) is stripped, it may be dried on blotting-paper, and kept as a film negative to be printed from either side as occasion may require. In experienced hands the collodion coating is seldom used except, perhaps, in the case of an extra valuable negative, and not at all when the negative film merely requires stripping from an unbroken glass to be simply reversed. Should, from insufficient hardening, the film expand, it may be brought back to its original dimensions by simply immersing it in methylated spirit for a short time.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Our friend and colleague "Free Lance," in the first three paragraphs of his brisk chat on things in general which follows this article, points out a few of the many respects in which the newly-formed Professional Photographers' Association can justify its existence, and render service to the interests it has been created to defend. There are few photographers in this country who, by long direct association with the profession and knowledge of its needs, are in such a strong position as "Free Lance" for contributing counsel and advice to the Executive of the Association, and we unhesitatingly attach great value to his ideas, coming as they do from a photographer of so wide and lengthened an experience.

We trust that the good example set by "Free Lance" will find many imitators amongst his brother professionals, and that these pages, which are freely placed at their disposal, will continue to record useful suggestions for the government and conduct of the Association. The summer months have gone, and autumn, with all its revitalised activities, has come again to detach men's thoughts from "mountain, moor, and sea," and to guide them once more into the grooves of progressive effort. In short, after the summer vacation, the active work of the Association is to be again taken in hand, and measures devised by the Executive for vastly augmenting the membership and organizing the provincial branches. From the P.P.A. handbook, a copy of which will shortly be sent to every member of the Association, we take the following note: "The Association has been formed to promote the interests of professional photographers. In accordance with the rules of the Association, 'all persons engaged in the commercial production of photographs, who are in business on their own account, or in partnership, or responsible managers of firms or companies, are entitled to membership.' The Committee desire to impress upon professional photographers that the promotion of the Association's objects can only be assured by a membership which includes a majority of the professional photographers of Great Britain and Ireland, and it is earnestly hoped that the existing members will use their utmost influence to persuade their brethren to apply for membership."

Sympathetic references to the Association have appeared in the lay press of Great Britain and the photographic press of the Continent, New Zealand, and America. It has been reserved for a former British photographic journalist, now pursuing a similar avocation in the United States, to assume an unfriendly attitude towards those of his quondam compatriots who are earnestly bent upon elevating their profession. Dr. John Nicol, the editor of the "American Amateur Photographer," writes as follows in that journal:—"Photographers are proverbially 'Dreich i' the draw,' difficult to be brought into association, even for their own benefit. A few weeks ago, judging from the photographic journals, British professionals from 'Land's End to John o' Groats,' and including Ireland, were up in arms against what they characterised as 'Bubbles and Smoke;' two firms, one soap, the other cigarettes, having, as a means of advertising, offered for a certain number of coupons and a cash consideration, to supply copies of any photograph that might be sent to them. Page after page in number after number of several of the journals were filled with most rabid abuse of the firms and their method, and with demands for instant association into a body powerful enough to crush what they called 'taking the bread out of the mouths of their wives and children.' One of the oldest and most influential of the journals took it up with a zeal and ability worthy of a better cause, with a faith in photographers that I at least have long ago lost, and did enough and more than enough to have scored a great success with any less conservative class. Meetings were held, the widest publicity given, committees formed, and 4000 copies of 'an appeal' mailed, so that every photographer in Great Britain and Ireland might be aroused to a realisation of the supposed danger and the need for an organization strong enough to give it battle. And what has been the result of four months of such heroic work to form an association that was by so many declared to be essential to the very existence of professional photography, and the annual subscription to which was only one dollar and twenty cents? The embryonic mountain developed into a mole-hill; the agitation began early in February and the list of members, according to The British Journal of Photography of June 7, includes only 189 names."

The list of members of the Association, according to The British Journal of Photography for July 7, includes about 400 names, the result of three months' work. Never in the history of photography has a paid membership of 400 being organized is so short a space of time. We should be willing to forego the compliments Dr. Nicol is so good as to pay us, if we could have, by way of exchange, a little less inaccuracy and a little less of the carping spirit which unfortunately characterises his article. Dr. Nicol left this country a great many years ago—about twenty we believe—so that his distance from the scene of action, coupled with his ignorance of the present position of British professional photography, may be held to materially discount his attack. However, if the worthy "Watchman" as he styles himself, will keep on watching these pages for the next few months, he will have cause to regret that he was incautious enough to pour cold water upon a young Association which we pledge ourselves will develop into one of the largest and most powerful organizations of the kind in the world.

The York meeting of the Association will no doubt supply the Committee with many useful hints in the work of organization. From Dublin, Aberdeen, Edinburgh, Norwich, Brighton, Manchester, Birmingham, Liverpool, and many other large centres we have been favoured with communications on the subject. The last letter contained a request for a hundred membership application forms. The first autumn meeting takes place in London next October; meanwhile, after the summer vacation, the Committee will recommence their labours and deliberations. Difficult as the good Dr. Nicol rightly says it is for photographers to be brought into association for their own benefit, the first great obstacle has already been surmounted, and the coming winter and spring will, we are convinced, see the Association so numerically powerful that no interest of professional photography will, in future, be assailed without there being at hand effective means of defending it.

ON THINGS IN GENERAL.

The Rev. Sidney Smith once spoke of people "who are so sorry for poor brethren, and do hope someone will do something for them." The idea might fairly be transposed and applied to another class of brethren—professional photographers—they do hope someone will do something to help them and protect their interests. Fortunately for them, someone (that word should really begin with a capital S) has in real earnest done something for them, given real hard work, and set such an association going that nothing but complete and utter supineness on the part of the profession will prevent it becoming a great success; all honour to the good men who have helped the start, and set the ball rolling. As far as can be seen, the one first cause that led to the inception of their labours — the cause of cigarette cheap copies—has entirely fulfilled my vaticinations, and has worked its own cure. I have never come across any one who has

had copies made by the cigarette makers—the system began by rank deception, seems to have ended, like the cigarettes themselves, in smoke. But all the same, now the Association of Professional Photographers is organized, and plans are arranged, let every professional in the country who has not already joined, do so at once, send in his name and as many suggestions as he likes—throw personal jealousies aside, and feel himself responsible for the well-being of one of the best societies in the world; for such it can and ought to be made.

There are plenty of directions in which the Association can at once direct its energies when it feels that it has the whole fraternity backing it. One pressing need will be the tracking to condign punishment of the heartless wretches who rob assistants seeking situations of their very means of obtaining them by appropriating and possibly utilising photographs sent as specimens of work. It must be understood that I do not believe all the tales one hears of appropriating specimens, for it is the exception rather than the rule for applicants to adopt reasonable precautions. If every applicant would write his full name and address on each specimen, and enclose stamp for their return, we should hear less of thieves of specimen prints. But even then there is a residuum which, as I say, it should fall within the province of the P. P. A. to track. Then, again, doubt cannot be felt that, before long, a vast change will ensue in the conditions of sale of materials, plates, and papers. As has before been asked, in what other business besides the photographic, has the large user to pay bigger prices for his materials than the little dealer who sells one-tenth as many? It is all very well to say it is in the dealer's interests—why should the dealer's interests be paramount? But the explanation is a figment. The scheme has largely increased profits so far; but the bubble has burst, the rats are leaving the sinking ship, and, as a letter last week in these columns will show, it is already a case of the "devil catch the hindmost."

Another subject which in all probability the P.P.A. will take up is that of insurance rates. The united insurance companies, however, are a stronger body than the Plate and Paper Makers' Association, and it will be difficult to move them, the more so as in their case the governing principles of the Association are founded on an ethical basis. But, like all large corporations, injustice may be done by them through want of thought or the usual inertia. If any one discuss the matter of charges with an insurance agent, he will be told that insurance of photographic premises and their contents does not pay, and so on. But, as a matter of fact, the loss in years gone by must, at that rate, have been enormous, as the risks were then so much greater than now. When the P.P.A. is in thorough working order they must approach the insurance companies, arrange an interview, and thrash the matter out thoroughly. Failing that, there would be a sufficient number of leading photographers to form an insurance company of their own. Honest insurers would join, as they would know their cases would be treated by men who knew the business. The dishonest insurers would remain with existing companies and justify their rates. It is only knaves who profit by fires; honest men always lose when they happen, and will take every precaution against them.

I always turn to the "Answers to Correspondents" when I get my JOURNAL. There is always in them either amusement or instruction to any one who reads that page. I was struck last week with the questions by "Photophil" under "Lantern Queries," questions showing that the writer had only a very elementary acquaintance with the subject. Thus he speaks of a transparence display through a sheet that looked like yellowed tracing paper; he admired the effect of absence of central glare, though he objected to yellowness. He can get all he wants without the yellowness or central glare if he employs tracing paper made without resinous matter. There are plenty such on the market; or, again, which would be better still, he might use architects' tracing cloth, glazed on both sides—that never turns colour, nor, if kept clean, becomes yellow. These materials, however, cannot be obtained in large sheets—the cloth not larger than forty-two inches wide in continuous rolls, and the paper in comparatively small sheets. I am writing away from my books, but I believe I am correct in my recollection. With regard to the "central glare," it is only a very ignorant lanternist who would obtain that, even with a linen sheet. One often hears of a sheet being wetted with water to make a better display, and I have seen a sheet so wetted when the lantern has been on the same side as the audience. Now, most users of a lantern know that the object of wetting is simply to add to the transparency of the fabric when the lantern is placed behind. At the same time the wetting has the further effect of preventing, under the same conditions, any appearance whatever of central glare.

The account given in last week's JOURNAL of a fatal accident through substitution, by a chemist's assistant, of methylated spirits in lieu of lime-water—a most extraordinary mistake—leads one, in light of the Editors' remembrance that a previous fatal mistake by another chemist led to heavy damages, to see that a chemist's "life is not a happy one." If one asks a draper for a yard of blue ribbon, and he supplies green by mistake, all he suffers is a slating; but an equally similar mistake by a chemist has led, as seen above, to heavy damages, and, in my own recollection, to eighteen months' imprisonment. Yet a chemist and druggist, by reason of his training, is far less likely to make disastrous errors than an untrained, unskilled man; hence, bearing all this in mind, I must say I do not join in the outcry against committing the sale of poisons to chemists and druggists alone. Let them have some recompense for the risks they take, and for the years of labour the legislature renders incumbent upon them before allowing them to sell poisons.

With regard to the permanency of collodio-chloride paper prints, it may be well to point out a possible source of error. When Mr. Wharton Simpson gave publicity to its virtues, and called it, if I remember rightly, leptographic (which a sarcastic speaker at a photographic meeting of the period said should be called "kleptographic," as the invention of collodio-chloride was not Wharton Simpson's), such paper was home-made, and I have no recollection of a German make being sold. Was any such paper made in Garmany and sold in this country twenty-eight years ago? For very many years aristotype paper, made in Germany, has been sold in this country, and most photographers imagined it to be a collodion paper. This, however, is an error; it was a gelatine paper. A relative of Liesegang (the maker), who held an important position at the manufactory himself, told me this some years ago. Is it possible that some of the so-called collodio-chloride paper is merely aristotype, believed to be a collodion paper? With regard to the merits of the collodion papers, it is quite true that an immense quantity comes from Germany; but it is, further, undoubted that the best is made in this country. It has, however, the grave defect of keeping badly. When past a fortnight old and stored in the usual way, it is incapable of giving the best results. Beyond this, it does not curl in washing, and has not the objectionable high gloss of the foreign kind.

The article on block-making by photography, in the issue of August 30, tells us that some publishers "will go to any reasonable expense by adding to its pictorial value by means of judicious touching up at the hands of an artist." It would be interesting to learn what is the average editor's idea of judicious touching up. I can give an example in the concrete which is far more valuable than one in the abstract. The story is true and was told me by the daughter of the Bishop of X——. A friend of the Bishop's sent him a pencil sketch of some place of local interest, and he in turn sent it to one of the illustrated papers, and when the artist saw it reproduced he was horrified to discover that the "judicious touching up" in his case meant the introduction of a number of palm-trees. On his return to England he went to see that editor; the only

response he obtained when he complained of these palms being introduced was, "Oh! the British public want palm-trees in Eastern pictures, therefore they must have them!"

What a number of correspondents of late have been asking about rights of light. It might be thought that everybody who has had any connection with building matters would have a full knowledge of these rights; but evidently such is not the case, as is shown by these frequently repeated questions. The matter is simple: any studio erected is liable to have its light blocked by a neighbour, unless the blocking "obstructs" a light a right to which already exists, by contract or user, and it will be found that rights of light are subjects upon which the most urbane and inoffensive of men are most sensitive, obstinate, insistent, and litigious. The right to a light by user means the enjoyment of such light without obstruction or objection for a period which, I believe, is now twelve years, though formerly twenty. On the other hand, the disuse of such lights by blocking on the owner's part, or by a neighbour without objection, for a period of two years only destroys any such rights. There is, of course, as in everything else, a diplomatic and a non-diplomatic way of going about the business. A neighbour when approached beforehand might, if there were no real injury, permit the erection of a studio if a nominal annual payment of a few shillings were made, while if the studio were built first, he might spend large sums in the protection of rights. There is one point further that may be mentioned with advantage. It is a common error to imagine that if a window is put in a wall where none existed before (a window such, perhaps, as would be needed for a studio) a neighbour objecting to be overlooked, can by law compel the removing or closing of such window by the person who built it. This is an error. The only remedy is for the aggrieved person to destroy the light gained by such window by erecting on his own ground an obstacle that will prevent light coming to the window; but this obstacle must not obstruct the light that comes to any other window where rights of light exist, as otherwise the obstructor will be liable to an injunction to restrain.

FREE LANCE.

SCALE IN PHOTOGRAPHY.

[Abstracted from an article in the Camera Club "Journal" for September.]

THE scale of the amateur photograph is mostly determined by the size of what might be styled the amateur camera, if only readers were not captious. To designate it the amateur's camera would not meet the difficulty, for that expression would be directed to the individual camera, not to the type which satisfies the requirements of the average amateur. The amateur camera must be handy, snappy and self-contained. It is only in a very subordinate degree that any question concerning the scale of the picture which it will produce affects the mind of its purchaser. Thus quarter-plate and 5×4 come to be standard sizes less on account of their fitness to adorn an album page than because their producer can carry about the camera that will produce them without the assistance of a caddy. Concerning such matters discussion is manifestly idle. The most cogent arguments will never make a half-plate camera portable or rob the quarter-plate of its pride of place in the hierarchy of picture-making machines.

Assuming, then, the impregnable position of the quarter-plate picture in the actual world, we may still inquire what in an ideal world, would be the considerations determining the scale on which a photograph would be produced. And this inquiry has its charm, for when so emancipated from practical considerations we are free to dwell upon an elementary fact like this—that the photograph will have to be looked at. The perplexed human photographer considers that it will have to be snapped and developed and printed and mounted and framed, all matters that will affect his personal comfort or his ability to pay income-tax, and it is small wonder if in the press of such considerations he omits to ask himself whether it will reveal when finished the features that he wants to place on record. If the worst comes to the worst, a magnifying glass will make it visible. The pity of it is that a magnifying glass will not magnify beauty, and if the beauty of a photograph happens to be its point of interest, that can only be seen in the picture as it stands.

Let it be assumed, then, that we have a photograph to deal with which is interesting in the same sense as a picture in black and white—for the poetry of its suggestions or the subtlety of its drawing or the grace of its subject—how is the appreciation of these qualities affected by the scale on which it is reproduced? Clearly this opens out a very complex inquiry, but it is possible to say in general terms that, as a rule, a very diminutive scale is fatal. Take, for example, the portrait of a pretty face. Portraits are habitually produced upon the smallest scale, and nothing is more familiar than the effort by which we trace a resemblance between our friend and her carte de visite. But the effort is always a conscious one. There is no illusion of roundness in the small-scale drawing, and no striking similarity betwen the picture and its original. The portrait, to be seen in detail at all, must be placed at the near point of vision, and the eye focussed as for reading print. All the conditions under which we view it are artificial and in contrast with those under which we view our friend. It is obvious that these conditions are largely affected by the scale of the picture. A mere enlargement would make it visible with ordinary accommodation of the eye, and indefinitely enhance its resemblance to a model in the round.

Not less does scale affect the picturesque qualities of a landscape. For example, consider the case of a landscape in which bare trees are delineated against a sky. The tracery of the interlaced branches and twigs is wholly lost to view in a small-scale print. To be seen at all it must be seen under conditions which allow the eye to follow the outlines from beginning to end. A print too small to satisfy this requirement reduces the tracery to a mere shaded mass, changing its character entirely, and with it changing the character of the picture. Nor is it in delicately-limned pictures only that the preponderating influence of scale is felt. Equally influential, although in another way, is the effect of scale upon masses of light and shade. In a small-scale picture a mass of dark colour or a spread of white may convey an impression of clear definition, but hardly of perspective depth. The eye is not capable of discovering the obscure detail in a deep shadow when that shadow occupies but a small area, but if it be large enough to challenge inspection it may contain a mass of cloudy detail which adds enormously to the picturesque effect. So in the opposite case of a mass of bright colour. Snow, in a small picture, looks white; in a large one it feels cold.

But while these elementary considerations point to mere enlargement as a valuable resource they yield no rule, for the simple reason that they do not indicate at what limit useful enlargement stops short. Nor can any such rule be deduced from mere abstract considerations. Photographic enlargement fails of success by reason of the impoverishment of the pigment long before the point is reached at which the painter with oil colours at command would feel himself beaten by the mere dimensions of his task. It is very instructive, from this point of view, to compare the lantern picture with the photographic print. In gradation of tone the lantern picture is incomparably poorer than the print, and in definition its inferiority is no less marked. Yet the lantern picture is satisfactory to the eye when expanded to a scale which would make the print appear diaphanous to the point of becoming the mere shadow of a shade. The explanation, no doubt, is that the contrast between the glittering high light and the full shadow is so much stronger in the case of the lantern picture than is the broadest contrast which the print exhibits, that the one justified itself where the other would be found manifestly wanting. It is, therefore, to the qualities of the medium used for printing out that the photographer must turn his mind, rather than to considerations of a purely artistic nature, if he would settle the major limit of the scale upon which his printing can be done. Body and depth of tone are what will set bounds to his ambition in this respect, and these he must accordingly study.

We have mentioned, in a note upon the Glasgow Exhibition, some very striking examples there to be found of successful photographic printing on a large scale. In this respect the German exhibitors at Glasgow stand in marked contrast with those from other countries, for although they are not by any means alone in the production of large canvasses—if the word may be allowed—it is very evident that they have been more impressed than their neighbours with the possibilities of the large-scale print. And their work is certainly not without its suggestiveness. Not only does it bring out in strong relief the artistic quality, on which we have above remarked, of large-scale work, but it shows also that materials are to be had which will yield results that can compare with any engraving process, and that carbon at least is no less effective as a medium of artistic expression in the photographer's film than in the engraver's plate.

EFFECT UPON THE PERSISTENCE OF VISION OF EXPOSING THE EYE TO LIGHT OF VARIOUS WAVE LENGTHS.*

III.

[Reprinted from the "Physical Review."]

Retina fatigued with blue.

TABLE VII. shows the results obtained when the retina was exposed to blue light.

TABLE VII.

Retina fatigued with blue ($\lambda = \cdot 440\ \mu$).

Wave length.	Persistence.	Wave length.	Persistence.
·400 μ	·0320 sec.	·498 μ	·0136 sec.
·405 ,,	·0295 ,,	·525 ,,	·0122 ,,
·414 ,,	·0267 ,,	·550 ,,	·0111 ,,
·425 ,,	·0235 ,,	·580 ,,	·0105 ,,
·435 ,,	·0207 ,,	·612 ,,	·0107 ,,
·444 ,,	·0191 ,,	·625 ,,	·0110 ,,
·455 ,,	·0166 ,,	·675 ,,	·0129 ,,
·467 ,,	·0151 ,,	·715 ,,	·0143 ,,
·480 ,,	·0143 ,,	·758 ,,	·0182 ,,

These values will be found plotted in fig. 9 in comparison with the normal curve. In the part corresponding to the blue, the two curves coincide, showing that in this region the persistence has not been changed by the fatiguing process. The persistence has, however, been increased in both the green and violet, which is shown by the elevation of those parts of the curve. In this case the increase in the green is 10 per cent., while for the eye fatigued with green it was 12 per cent. The increase in the violet is 16 per cent., against 27 per cent. for the case when the eye was fatigued with violet. The readings in the extreme violet were, however, subject to a greater experimental error, as the illumination of that part of the spectrum was comparatively feeble. The curve obtained for the eye exhausted with blue, is therefore practically the superposition of the green and violet curves. The deduction is obviously that the sensation of blue is the consequence of the excitation of the sensations of green and violet. It will be noticed that the blue curve runs under the normal in the red, a phenomenon observed in two previous curves. This is shown best in the violet curve, where the abnormal runs under the normal in both green and red, indicating that when the retina has been exposed to violet this sensation is exhausted, but the other fundamental sensations, red and green, are rendered a little more acute.

Retina fatigued with yellow.

We have now to examine the results obtained when the fatiguing colour was yellow. The arc spectrum was dispensed with in this case, and the arc was replaced by a sodium flame. The yellow sodium light was of sufficient intensity to fatigue the eye which was placed at the focus of a lens. The following results were obtained:—

TABLE VIII.

Retina fatigued with yellow ($\lambda = \cdot 589\ \mu$).

Wave length.	Persistence.	Wave length.	Persistence.
·400 μ	·0312 sec.	·533 μ	·0143 sec.
·415 ,,	·0302 ,,	·573 ,,	·0124 ,,
·438 ,,	·0236 ,,	·620 ,,	·0124 ,,
·454 ,,	·0205 ,,	·647 ,,	·0128 ,,
·475 ,,	·0177 ,,	·678 ,,	·0140 ,,
·492 ,,	·0163 ,,	·715 ,,	·0164 ,,
·512 ,,	·0155 ,,	·758 ,,	·0210 ,,

This curve, plotted in fig. 10, in comparison with the normal curve, shows the yellow, blue, and violet regions to be unaffected, while elevations were produced in the green and red. The whole curve is a little above the normal, which is probably due to a slight change in the pressure of the gas making the spectrum a little less luminous. The maximum increase in the persistence of red impressions in this case is 10 per cent., while in the case of exposure to red it was 8 per cent. This may be compared also with the increase in the red when the eye was blindfolded, which amounted to 9 per cent. In the yellow curve the increase in the green is 12 per cent., which is exactly the same as in the green curve. The position of the maximum in the two cases is, however, not the same.

* Continued from page 71, Supplement.

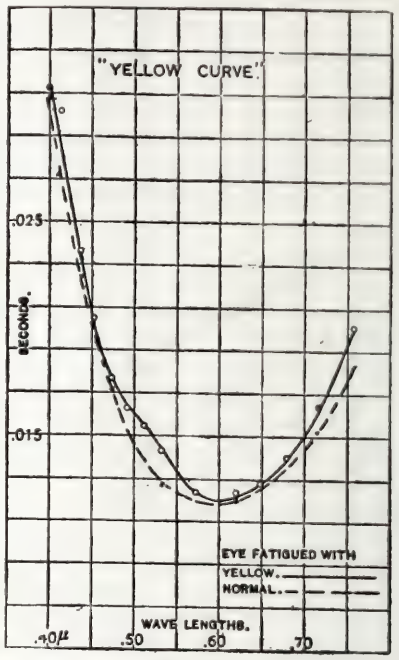


FIG. 10.

Yellow light, therefore, has the same effect on the retina as red and green together, and it must be concluded that the sensation of yellow is due to a simultaneous disturbance of the red and green visual apparatus. Whatever may be the "deliverances of consciousness" as to the purity of blue and yellow, in the light of experiment we are forced to conclude that they are not fundamental, but compound sensations, as far at least as their effect on the retina is concerned. Further than that, this paper does not pretend to deal with them.

Retina fatigued with white light.

Having successively fatigued the retina with five well-defined spectral colours with the interesting results described, some curiosity was evinced as to the probable effect of tiring the retina with all wave lengths at once, that is with white light. From the standpoint of the Young-Helmholtz theory, it was thought that the curve in this case should show three elevations: in the red, the green, and the violet. On the other hand, assuming the truth of the Hering theory, the white light would affect the white-black visual substance which is independent of the other two. Colour sensations affecting the likewise independent red-green and yellow-blue substances should accordingly show no change in persistence. The result does not confirm either expectation. To accomplish the fatiguing of the retina, the white light from the arc passed through a lens and fell upon a piece of white paper placed at a little distance from the focus. The round spot of light was partly transmitted, and fell upon the retina for the usual time of five minutes. A series of after-images followed, which threatened to interfere with the accuracy of the observations. Upon looking at a portion of the spectrum in the field of view, it appeared as if seen through a hazy light of varying colour. For the first few seconds this after-image was of a faint yellowish tint, which gradually deepened into an intense yellow, completely obscuring the spectrum. The first hazy tint could be easily restored by winking, and this enabled the observer to take the readings always under the same conditions. The results given in table IX. are so uniform as to inspire belief in their accuracy.

These data are plotted in fig. 11 in comparison with the normal curve. The curves, it will be noticed, are approximately parallel, indicating no elevations in any part. Apparently this does not confirm the Young-Helmholtz theory of the sensation of white. The fact that the persistence of all the colour sensations is increased shows an interdependence of the visual substances not provided for by the Hering theory. But at any rate the curve seems to indicate the exist-

ence of a white sensation partially connected with, and partially distinct from, the fundamental colour sensations. That white is either an independent or semi-independent sensation, is claimed by Ebbinghaus and by Mrs. Franklin in their theories, and Abney[12] has recently obtained experimental results which point to the same conclusion.

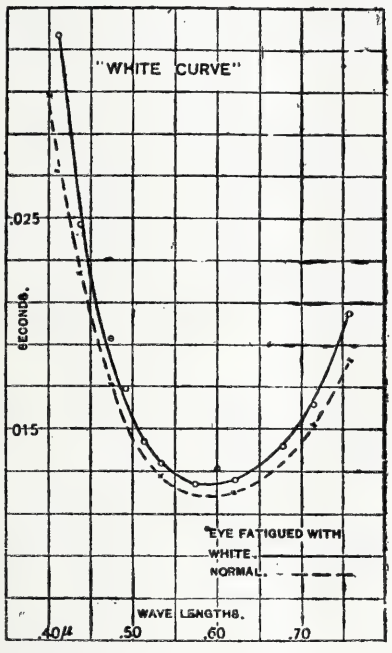


Fig. 11.

Table IX.

Eye fatigued with white light.

Wave length.	Persistence.	Wave length.	Persistence.
·410 μ	·0337 sec.	·573 μ	·0124 sec.
·438 ,,	·0247 ,,	·620 ,,	·0126 ,,
·475 ,,	·0193 ,,	·678 ,,	·0142 ,,
·492 ,,	·0169 ,,	·715 ,,	·0161 ,,
·512 ,,	·0144 ,,	·758 ,,	·0205 ,,
·533 ,,	·0134 ,,		

In the discussion of the various curves thus far considered (figs. 4 to 10), the percentage increase of the duration of colour impressions has been given. For greater convenience of comparison these values have been brought together in the following table:—

Table X.

Percentage of increase in the duration of colour impressions when the eye eye is fatigued by exposure to various colours.

Region affected.	Colour of the fatigue stimulus.						
	Red.	Green.	Violet.	Blue.	Yellow.	White.	Eye blindfolded.
Red.	8 %	0 %	0 %	0 %	10 %	9 %	12 %
Yellow.	0	0	0	0	0	5	5
Green.	0	12	0	10	12	13	7
Blue.	0	0	0	0	0	13	10
Violet.	0	0	27	16	0	12	14

When it is remembered that the values in this table represent experimental results obtained at intervals during several months, that no attempt whatever was made to keep the eye in a condition of constant sensitiveness, and that the conditions under which the abnormal states of the retina were induced varied to a considerable extent from time to time, the results, especially in the red and green, show a uniformity that may very properly be considered remarkable. It can be no mere chance agreement of results. Certainly the retina, even under abnormal conditions, cannot have such a varying sensitiveness as is generally supposed. The values do not differ, for each colour, by more than the presumable experimental error, except one value in the green and one in the violet, which will be evident on referring to the table. The averages of the tabulated results are as follows:—

Red,	9.75 per cent.
Yellow,	5 ,, ,,
Green,	10.8 ,, ,,
Blue,	11.5 ,, ,,
Violet,	17.2 ,, ,,

In all these experiments the retina has apparently been brought to a maximum abnormal condition, though the fatiguing light has been of varying intensity. There are not sufficient experimental data yet to show whether greatly increasing the intensity of the light exhausting the retina will increase this maximum condition or not, though it is anticipated that it will.

It has already been pointed out that, when the retina is made abnormally sensitive by being kept in the dark, the persistences of the various colour sensations are unequally increased. The same is true when the retina is fatigued; for, when any colours have their persistences affected, the increase is unequal in different parts of the spectrum, in all cases being least in the yellow and reaching maxima in the red and violet.

Frank Allen.

[12] Abney, Sensitiveness of the Retina to Light and Colour. "Phil. Trans.," A., 1897, Vol. 190.

LIGHTLESS PHOTOGRAPHY.

Some curious facts, says the "Photographic Times," have been discovered as to the actinic effects upon sensitised films of various surfaces and substances which have demonstrated that an impression can be made on a photographic plate without the aid of light.

This offers a novel field perhaps to many readers for experiment and investigation. It may also result in useful and advantageous contributions to photographic knowledge. These series of facts alluded to, while very generally recognised and known amongst scientific men, have not, we think, been prominently brought to the attention of the photographic and amateur public.

In an instructive lecture by William J. Russell, delivered at the Royal Institution in May, 1899, a review of the compounds and bodies which affect photographic films was given, accompanied by a series of experimental results obtained by the lecturer in this curious field of photography. Amongst these are the fresh surfaces of zinc, also of magnesium, calcium, nickel, aluminium, lead, bismuth, tin, cobalt, antimony. As zinc is easily obtained, it can be, for such experiments, more readily employed than anything else, and the results given with this article have been obtained in that way. It is an interesting fact that the zinc in brass gives, when present in sufficient quantities, to the body a photographic influence. A brass, for instance, with 30 per cent. of zinc hardly affects the photographic plate, whereas one with 70 per cent. of zinc produces a dark picture. Many liquids affect the plate. All terpenes, the essential oils, as oil of bergamot, oil of lavender, oil of peppermint, oil of lemon, also cologne, cinnamon, coffee, tea, linseed oil, and olive oil affect the plate. In the case of these active liquids the picture is produced by stencilling with paraffin, the paraffin being negative, or passive, and having no effect upon the plate.

There is, of course, no practical value to this subject, but its peculiar character must interest experimenters, and numerous striking results might be variously obtained. The results have been attributed to the influence of peroxide of hydrogen, and an extract from Mr. Russell's address will sufficiently explain this point of view: "Hydrogen peroxide is the direct cause of these pictures produced in the dark. Indirect proof has to be resorted to. Only certain metals are capable of producing them. This list of active metals was determined solely by experiment, and when completed it was not evident what common property bound them together. Now, however, the explanation has come, for these are the very metals which most readily cause, when exposed to air and moisture, the formation of this body, peroxide of hydrogen. Delicate tests show that all the metals named not only can in the presence of moisture produce it, but that their power of doing so follows the same order as their power of acting on a photographic plate. Also the active organic bodies essentially belonged to the class of bodies known to chemists as terpenes. Now a most characteristic property of this class of bodies is that in the presence of moisture and air they cause the formation of hydrogen peroxide, so that whether a metal or an organic body be used to produce a picture, it is in both cases a body capable, under the circumstances, of causing the formation of hydrogen peroxide."

Mr. Orchard undertook to make some of these lightless photographs. A piece of zinc was obtained, some miscellaneous scratches made on it, and an exposure of four hours given. In making the exposure he took plate and zinc into a dark room, and, placing the scratched zinc on the plate, placed both in a covered plate-box. Upon development no results were obtained whatever. It was then noted

that at ordinary temperatures long—very long—contact was necessary. A second plate of zinc was more deeply engraved, so that the furrows were fairly lustrous, and an exposure or contact of three days made. Cramer's orthochromatic plates were used, and metol and hydroquinone developer employed in the development. A faint spectral effect was secured, scarcely reproducible.

A third experiment, under the same conditions, with an exposure of four days, then a fourth and fifth attempt was made, giving an exposure that extended from June 6, 3.30 p.m., to 12, mid-day, June 14. The results were an improvement in each case. Perfection in these results is, of course, difficult to secure, and it is recommended as a field of experiment in which ingenuity can be applied successfully.

Depth of cutting, so that a broad, lustrous exposure of the zinc is made, influences the impression.

L. P. Gratacap and Wm. Orchard.

WINTER CLASSES IN PHOTOGRAPHY AT THE LONDON POLYTECHNICS.

The prospectuses of four of the London Polytechnic Institutes at which winter classes in photography are held have been issued, and we subjoin the necessary particulars for the information of those of our readers who may be desirous of taking advantage of the facilities afforded for gaining a knowledge of photography by class study:—

LONDON COUNTY COUNCIL SCHOOL OF PHOTO-ENGRAVING AND LITHOGRAPHY

(6, Bolt-court, Fleet-street, E.C.).

The Seventh Session will commence on Monday, September 30, 1901. The school is open to those who are genuinely engaged in business in any branch of the photo-mechanical, photographic, designing, lithographic, engraving, and printing crafts, and no provision whatever is made for amateurs. The courses of practical instruction are arranged to suit the following craftsmen:—Photo-engravers. — Line and screen negative-making, etching, proving, tri-colour work. Photo-lithographers.—Negative-making, photo-lithography, collotype (plate preparation, press and machine work), combinations of lithography and collotype. Photographers.—Line and continuous tone negative-making, printing, enlarging, transparency-making. Lithographers.—Lithography, map and plan drawing, transfer writing, drawing, design, lettering, photo-lithography. Designers.—Design, drawing, lithography. Draughtsmen.—Drawing, design, lettering.

The school is well equipped with the necessary appliances for study and practical work. It contains large studios for life and antique drawing, design rooms, lithographic studio, lithographic press room, photographic studio with electric light installation, dark rooms, collotype preparation and printing room (with three presses), etching rooms, lecture room, etc.

Only those engaged in the trade are admitted. The fee which admits a student to the classes is 3s. a term of three months, inclusive, for those in receipt of not more than 30s. per week. For those in receipt of more than this sum the fee is 7s. 6d a term. The photo process department is open for day instruction, full particulars of which will be found in the prospectus, which may be obtained of the Principal of the school at the above address.

THE GOLDSMITHS' INSTITUTE, NEW CROSS, S.E.

During the session 1901-2, on Friday evenings, at 8.30, commencing on Friday evening, September 27, a series of 26 lectures and demonstrations on the theory and practice of photography will be given.

Students attending this course will be able, if desired, to sit for City and Guilds' Examination in May, 1902, and the whole course of the above lectures will be in accordance with the City and Guilds' Syllabus. Fee for the six months' course, 7s. 6d. (exclusive of the City and Guilds' examination fee). In addition to the above there will be the following practical courses, in which each student receives individual instruction:—

Monday afternoons, from 2.30 to 5, commencing Monday, September 30 (with introductory meeting on September 23), a special course of 12 indoor and 3 outdoor practical lessons for ladies only. Fee for the course, 10s. 6d.

Monday evenings, from 6.30 to 9, commencing Monday, September 30 (with introductory meeting on September 23), a special course of 12 indoor and 3 outdoor (Saturday afternoons) for ladies only. Fee for the course, 10s. 6d.

Tuesday evenings, from 7 to 10, commencing Tuesday, October 1 (with introductory meeting on September 24), a course of 12 indoor and 3 outdoor (Saturday afternoons) practical lessons in elementary photography for gentlemen. Fee for the course, 10s. 6d.

Wednesday evenings, 7.30 to 10, commencing Wednesday, October 2 (with introductory meeting on September 25), a course of 24 lessons in photo-mechanical processes, photo-lithography, collotype, half-tone blocks, and photogravure. Fee for the six months' course, 12s. 6d.

Thursday evenings, 7.30 to 10, commencing Thursday, October 3 (with introductory meeting on September 26), an advanced course of 12 practical lessons, comprising enlarging in bromide, making enlarged negatives, carbon, platinum, and gum-bichromate printing, etc. Fee 10s. 6d.

The photographic studio and dark rooms are very completely equipped, and are fitted with electric arc lamps for copying and portraiture. The department is provided with studio, landscape, lantern slide and copying cameras, an enlarging lantern, and a powerful electric projection lantern; it also has complete outfits for photo-lithographic and collotype work, for platinotype and carbon printing, and for retouching and other branches of modern photographic practice. Students must provide their own sensitive paper and plates, but all chemicals and apparatus required will be furnished by the Institute. Since the photographic classes are necessarily limited in number of students, applicants will be accepted in order of application. Should a sufficient number of applications be received, other classes will be held on separate evenings.

THE BATTERSEA POLYTECHNIC, Battersea Park-road, S.W.

Teacher of photography: Mr. E. Senior.

Elementary (25 lessons).—Lectures, Tuesdays, 7.30 to 8.30; students 4s.; amateurs 6s. Practical, Tuesdays, 8.30 to 10; students 7s.; amateurs 10s.

Advanced (30 lessons).—Lectures, Thursdays, 7.30 to 8.30; students 5.; amateurs 7s. 6d. Practical, Thursdays, 8.30 to 10.; students 10s.; amateurs 12s.

The advanced course prepares students for the City and Guilds' Examinations.

The new regulations of the City and Guilds' Institute require students to pass a local practical examination before admission to the written examination in the ordinary grade.

The photographic department contains a large studio, fitted with Joel arc lamp and reflector, for photographic work at night; two commodious dark rooms, lit with electric lanterns, and fitted up with every convenience for work. The equipment includes a 8½×8½ studio camera and lens, and 10×8 copying camera, fitted with Zeiss lens, an electric light enlarging apparatus with 10 in. condenser, a complete set of carbon and platinotype printing apparatus, and a special camera for lantern-slide making, so that ample provision exists for practical work. The classes are primarily intended for trade students, but others are admitted upon payment of higher fees.

Students will be provided with necessary chemicals and apparatus free of cost, but must provide their own plates, sensitive paper, etc.

Students who desire to gain a thoroughly sound knowledge of the science connected with photography are strongly advised to join a chemistry class, and to attend the lectures on Light.

Syllabus.—Elementary.—Lectures on principles of photography, the camera and detached parts, the dark room and fittings, use of camera, plates, exposure, lenses, developers, defects, intensifiers, printing and toning, practical work in dark rooms, and instruction in taking and copying with electric light.

Advanced Lectures.—The studio, portraiture, lighting the model by daylight and electric light, use of screens, diffusers, etc.

The Dark Room.—Illumination of, and methods for testing safety of light.

Negatives.—Exposure of gelatine plates under every condition of light, subject, etc.; use of exposure tables, meters, etc.

Development.—Nature of development, the various substances in use and their relative advantages and disadvantages.

Intensifying and Reducing.—Both wholly and locally, the preparation of gelatine emulsions, composition of and defects in gelatine plates.

Optics.—The construction and use of photographic lenses, testing lenses, preparation and use of colour screens for isochromatic photography, use of shades and instantaneous shutters, testing speed of shutters.

Colour Sensitometry.—The various forms of apparatus devised by Sir William Abney for adjusting light filters for use in ortho-chromatic and three-colour photography.

Photography in Colours.—Ives's, Joly's, Lippmann's, and diffraction processes.

Cameras.—Various forms and their use, camera stands, testing cameras.

Landscapes.—Choice of position, direction of light, etc.; use of view meters.

Printing.—Printing in silver, carbon, and platinum, including vignetting; printing in clouds, etc.

Toning and Fixing.—Theory and practice of, with formulæ for various solutions.

Retouching and Spotting.—Mounting prints, theory and practice of the wet plate process, both negative and positive.

Elementary Photographic Chemistry.—Simple test for ordinary photographic chemicals.

Enlarging.—General principles involved, and calculations in enlarging or reducing to scale.

Practical Classes.—Instruction will be given in negative-making, contact printing on bromide paper, silver, and platinum printing, general studio work, and lantern-slide making; wet collodion process; single and double transfer carbon printing; artigue printing; and in the use of Dr. Albert's orthochromatic collodion emulsion.

Enlarging.—A special class in enlarging will be held on Tuesdays, 8.30 to 10. Fee for 10 lessons, 9s.; half course, 6s. An electric light enlarging apparatus has been added, and students joining this class will receive individual instruction in making plain and vignetted enlargements on bromide papers, and in modifying the colours of prints by toning.

THE NORTHAMPTON INSTITUTE (the City Polytechnic), St. John-street-road, E.C.

Tri-colour Process Work and Colour Photography.—The following special lecture and practical courses for photo-process workers and general photographers have been arranged in co-operation with the London County Council School of Photo-engraving and Lithography, Bolt-court, E.C.

Tri-colour Process Work.—Lecturers: Mr. Charles W. Gamble (Bolt-court School), and Mr. A. J. Bull. A course of 12 lecture demonstrations with practical work, on Friday evenings, from October 4 to December 20, inclusive.

Lecture Demonstrations, Fridays, 7 to 8 p.m. Syllabus.—General introduction, nature of white and coloured light, absorption and reflection of colours, primary spectrum colours, and "primary" pigment colours, Maxwell's colour vision curves, choice of pigments and screens for tri-colour work, influence of order of printing, use of ruled screens, preparing sensitive plates, best conditions of lighting and using the camera, production of the negative, general outline of the production and treatment of blocks, selection of paper, printing.

Practical Work.—Laboratory Work, Northampton Institute, Fridays, 8 to 10 p.m. Photo-process Work, Bolt-court School, Tuesdays, 7 to 9.30 p.m. Only those engaged in the process trade can be admitted to the practical class at the Bolt-court School in accordance with the rule in the tri-colour class.

Colour Photography and Measurement.—Lecturer, Mr. A. J. Bull. A course of 7 lecture demonstrations with practical work on Friday evenings, from January 10 to February 21, inclusive, as a continuation of the preceding course. The course is further intended for professional photographers and others having a good knowledge of ordinary photographic work, and who desire to become familiar with colour photographic processes.

Lecture Demonstrations, Fridays, 7 to 8 p.m. Syllabus.—Nature of white and coloured light, principle and use of spectroscope, Maxwell's colour vision curves, addition and subtraction of colours, making and testing of colour screens, colour sensitiveness of photographic plates, orthochromatising, choice and testing of dyes for orthochromatising.

Absorption Methods.—Explanation of Ives's, Joly's, and Lumiere's processes and their working. Kromskop and other viewing arrangements.

Interference Processes.—Lippmann's process and its explanation; recent developments of Lippmann's process.

Primary and complementary colours, formation of all colours from primary colours, peculiarities of colour vision and colour blindness, Lovibond's tinto meter, explanation and mode of use, measurement of colours and classification of pigments.

Half-tone Process Work.—Lecturer, Mr. Charles W. Gamble (Bolt-court School). A course of 6 lecture demonstrations with practical work at the Northampton Institute, on Friday evenings, from February 28 to April 11, 1902. The object of this course is to give the simplest possible exposition of the scientific principles underlying half-tone work, and also an account of the best practical methods and plant to be employed.

Lecture demonstrations, Fridays 7.15 to 8.15 p.m.

Syllabus.—Object of breaking up half-tone into line and dot for relief printing, mechanical methods of converting bas-relief into line and dot, use of V tool, optical methods of breaking up, use of cross line screen, conditions for securing true optical V, influence of width of screen ruling, size and shape of stop, distance of screen and sensitiveness of plate on the result, practical details of process cameras, lenses, and accessories, lighting, exposure, and development, preparation of block, exposure, etching, etc., finishing blocks, fine etching, routing, details of finishing and printing machinery, choice of paper and printing.

Practical Work.—Laboratory Work, Northampton Institute, Fridays, 8.15 to 9.30 p.m. Photo-process Work, Bolt-court School, Mondays and Wednesdays, 7 to 9.30 p.m.

Fees.—Members or Associates, 10s.; non-members, 15s., for the three courses. Members or Associates 4s., non-members, 5s. 6d., for any single course. Particulars of the work carried on at the L.C.C. School of Photo-engraving can be had on application to the Principal of the school at 6, Bolt-court, Fleet-street, E.C.

Studio Gossip.

SATURDAY next, September 14, is Lifeboat Saturday at Brixton. The Hon. Secretary is the well-known local photographer, Mr. R. Lang Sims, whose capacity for organizing work of the kind was well proved on the occasion of the Carnival in aid of the "Daily Telegraph" War Fund.

THE Finsen Treatment of Lupus.—A special meeting of the governors of the London Hospital was held at the institution, Whitechapel-road, last week. Mr. John H. Buxton presided, and, in moving the adoption of the report, said that the Finsen light treatment of lupus, which was introduced into the hospital by the Queen, continued to be a great success. The lamps had been of the utmost service, but it had been discovered that smaller and cheaper ones were equally effective. During the past fifteen months 215 patients had been treated.

ACCORDING to the "Westminster Gazette," a gentleman named Farman, of Long-acre, was last week summoned, at Eastbourne Police Court, for furiously driving a motor-car on the sea front. Defendant was described as manager of the Automobile Company. The constable said the motor in question went by "like a flash," and was going at the rate of thirty or forty miles an hour. Some one on the car had a camera, and was taking photographs. Defendant denied that he was travelling at a greater speed than ten or twelve miles an hour. Had he been driving at a greater speed he would not have successfully taken the pictures. The Bench imposed a fine of £5 and costs.

THERE is a good story about Queen Victoria's Diamond Jubilee which has peculiar interest for photographers, but which we do not remember to have seen in print. If its publication now makes havoc with the after-dinner repertory of any of our fellow members, we humbly apologise and plead in mitigation of sentence a good intention and the happiness of the greatest number. The story, with immaterial variations, runs thus: The "Illustrated Trumpeter" had engaged a certain well-known photographer to furnish a picture of the Jubilee procession, upon the terms of no picture no pay. For a fully successful picture an extravagant price was agreed upon; but the risk, known to both parties, was that the Queen would carry a parasol, and that consequently her face would be lost in shadow. It was clearly understood that a picture obtained under those conditions would not answer the requirements of the case. The photographer was, what every photographer ought to be, a man of boundless resource, and he thought out a plan for securing his picture, which left nothing but a negligible quantity to chance. A balcony in Ludgate Circus afforded him his point of view, with the incidental advantage that there was sure to be some delay and one or two stoppages at that point, where obelisks encumber the roadway and a beginning has to be made with the ascent of Ludgate Hill. Queen's weather, as our readers know, prevailed, and every circumstance favoured the enterprise. In due time the procession arrived, and the royal carriage rolled into position beneath the camera. A halt, not unforeseen, occurred at a convenient point, the crowd rose to shouting pitch of enthusiasm, and everything would have been perfect had it not been for the royal parasol which entirely concealed the Queen's face. This, however, was the photographer's opportunity, and this the problem which he had maturely thought out. Above the roar of the crowd's applause he sent a piercing shriek. Her Majesty heard, and, turning aside her parasol, she peered for a moment in the direction of the balcony from which the shriek came. In that instant the camera snapped. An hour later the plate had taken its place among that photographer's failures as easily the completest failure of them all. Of course, our readers have a dozen simple explanations ready to hand—bad plate, doubly exposed, let fall, &c.—but they are all wrong. The plate was of the best, the exposure entirely successful, the picture complete in every part, even to the details of the handkerchief waved by an enthusiastic lady in the crowd, which, streaming in the wind, exactly covered the Queen's face as seen, or rather as unseen, through the camera lens.—"Camera Club Journal."

News and Notes.

THE Nobel Prizes.—Two of the Nobel prizes have been awarded after mature deliberation. Dr. Niels Finsen, of Copenhagen, received one for his discovery of the light treatment for lupus, and the other one was given to Professor Pavloff, the Russian physicist, for his researches in metabolism.

THE Planiscope Lens Competition.—Messrs. John J. Griffin and Sons, Ltd., of 20-26, Sardinia-street, Lincoln's Inn-fields, London, W.C., write: "We should be obliged if you could find space in your columns to remind those of your readers who are using planiscope lenses that our competition for the best pictures produced with the tele-photo, wide-angle, portrait, or copying lenses closes on September 30."

PRACTICAL Instruction in Photography.—The Borough Polytechnic Photographic Society again announces a course of elementary lectures in photography, extending from October to March. The whole of the lectures are accompanied by practical demonstrations, in which those present are invited to take part, and an endeavour is made to simplify each subject so that it is readily understood by the veriest beginner. These lectures are held at the Polytechnic Institute, Borough-road, S.E., every Friday evening, commencing on October 4, and are in addition to the ordinary meeting of the Society held every Wednesday. The Society possesses a well-equipped dark room attached to a large lecture

studio, and an efficient enlarging apparatus, fitted with an 11 in. condenser, has recently been added for use of members. The whole of these, as well as many other privileges, can be had for a nominal subscription of 5s. per annum. An explanatory syllabus can be obtained from the Hon. Secretary, Mr. P. C. Cornford, 103, Borough-road, S.E.

THE Glasgow Southern Photographic Association.—The Annual Open Photographic Exhibition will be held in the rooms of the Association, Y.M.C.A. Buildings, Eglinton-toll, Glasgow, from December 23, 1901, to January 4, 1902, inclusive. Silver and bronze medals and certificates are offered for competition in the following open classes:—(1)Landscape and seascape; (2) Portraiture and genre studies; (3) Lantern slides (in sets of three); (4) Stereoscopic work (sets of two prints or transparencies); (5) "Glasgow Exhibition, 1901, work." This must be in the form of a lantern slide, the negative of which must have been produced by a camera held in the hand during exposure. Open to amateurs who have never received an award in any open exhibition. Two bronze medals and two certificates offered. (6) Any subject. Entries close December 11, 1901. The judges are Messrs. Tom McEwan, R.S.W., J. Douglas Ritchie, and William Goodwin, and the Exhibition Secretary, Mr. John B. Haggart, 93, Norfolk-street, Glasgow, to whom all communications should be addressed.

INDIAN Photographic Journalism.—Mr. George Ewing writes in the August number of "St. Veronica":—"During the past sixteen months I have performed a journalistic feat of which I am rather proud. I have in the spare moments of a very busy official life edited two photographic journals 'St. Veronica' and the 'Journal of the Photo Society of India,' and edited them, not with the paste pot and scissors beloved of Indian journalists, but with the pen, writing the greater portion of the pages myself. And my work has elicited the encomiums of the leading photographic journals of both Europe and America. The success that attended my efforts in the cause of photography would have made me happy had I been able also to keep pace with my correspondence; but, do what I would, letters and inquiries have had frequently to be kept for days before replies could be sent. This is the fly in my ointment. However, I can now promise my correspondents replies by return of post, as I have severed my editorial connection with the Photographic Society of India, and have more time to bestow on my own flock."

THE Bristol and District Photographic Society is very much in evidence, and shows such signs of vigour that a useful existence may be anticipated, says Dunscombe's "Bristol Photographic Chat." The excursions on alternate Saturdays have been very successful, and new members are joining. The programme for the winter season will be ready early in September, and promises to be of much interest. Mr. John Fisher (Kensington School of Art) will be the judge of the photographs sent in for the September competition, at which three prizes will be awarded. The members are also invited to show their appreciation of the competition pictures by voting. Two folios of work by the members are in circulation, so that all may see what is being done and offer their criticisms. As the financial year ends December 31, the Committee have decided to reduce the entrance fee to members joining for the remainder of the year. The first Secretary having left Bristol, had to resign, and the position has been accepted by Mr. H. Buchan, 5, Osborne-avenue, Ashley Down, who will be pleased to give information about the Society and enrol new members.

ASTRONOMICAL Photography.—At the annual meeting of the South Australian Photographic Society, reported elsewhere, the retiring President (Mr. R. F. Griffiths) delivered an address on the development of the astronomical branch of photographic activity. In the course of his remarks he showed conclusively that the development of the art was one of the most remarkable features of the age. One had but to look around to-day, he said, to note how largely it entered into daily life. Not only did science call in its aid, but it was incorporated with all the industrial arts, and its educational influence was unbounded. By it we were brought in touch with passing events, far-off lands, and every new discovery, and by means of the optical lantern its use in public lectures and schools alone entitled it to be considered the most mighty educational factor of our time. In a short address it was only possible to even briefly study one phase of its development. In 1839 Daguerre's valuable discovery was quickly recognised by Arago, the celebrated French astronomer, as a means for delineating the surface of the moon and sun. De La Rue's pictures were real and marvellous works of art. Having no clockwork, he guided his telescope by hand by keeping a lunar crater, as seen through the back of the collodion film, on the same spot on the plate, and his photographs of the moon were not surpassed for more than thirty years, when the great Lick telescope was established. Mr. Griffiths led his audience by easy and fascinating stages through the various phases of the subject, and showed that only by means of photography had many of the secrets of the sun's constitution been revealed. Up to 1878 free-hand drawings were the only means by which the corona, that marvellous silvery halo which surrounds the sun, and which is only seen during a total eclipse (lasting, under the most favourable conditions, not more than eight minutes), could be delineated; but in that year, out of 40 or 50 freehand drawings made, hardly any two in any way resembled each other, and none of them the photographs. It was concluded that, under the exciting conditions of an eclipse, the average astronomer was quite unable to sketch what he really saw. By means of the art a daily record was kept all over the world of the sun, its spots, and prominences, if any, around its edge. In the spectrum analysis of heavenly bodies, and in the domain of the fixed stars photography had done, and would do the most useful work. To-day one-half of the stellar spectra work was done by its means. Within three years Professor Pickering, of Harvard College, completed a spectroscopic survey of all the stars higher than the seventh magnitude lying between latitude 25.5 and the north pole, recording over 10,000 stars. Without photography this work would have been absolutely impossible. By photography the marvellous and stupendous daily changes in comets, wholly undreamt of before, had been revealed; it had brought about a great change of ideas as regards the constitution of the nebulæ; double stars had been discovered which escaped detection through the largest telescopes in existence; the Pleiades (or Seven Sisters) had been accurately counted, measured, and shown in their correct positions; and now, to crown all, a marvellous photographic record of the entire heavens, started in 1891, was nearing completion, and when completed would have utilised 44,108 plates, and would reveal over 20,000,000 stars. These were being measured by a small army of computors for a catalogue. This gigantic scheme was characterised as a fitting climax to the photographic work of the last century.

Commercial & Legal Intelligence.

MR. S. D. McKellen informs us that he has resumed business at 24, Market-place, Manchester. He is working out a new high-class cheap hand-camera to be named "the Mac."

THE Century Photogravure Company, Ltd.—The above-named company has been registered by G. S. and H. Brandon, of 15, Essex-street, W.C., with a capital of £10,000 in £1 shares. The objects of the company are to take over the business of photogravure, three-colour, and half-tone block-makers and printers, carried on at 21, Farringdon-avenue, E.C., by the Direct Photogravure Company. There will be no initial public issue. The company is registered without articles of association.

MESSRS. Bender and Co., Photographic Art Works, of 10, Berners-street, Oxford-street, London, W., write: "We should esteem it a favour if you would kindly announce in the columns of your paper that we have been appointed sole agents for Great Britain and Ireland by Mr. Charles Bernhoeft, of Luxemburg, for his flashlight apparatus, which received last year the gold medal at the Paris Exhibition, and also two gold medals at the International Exhibition, Stuttgart, and Jubilee Exhibition, Frankfurt. In about a fortnight's time we shall be prepared to give demonstrations, and to answer all inquiries to those interested in this subject."

THE Glass Industry in Belgium.—The Brussels correspondent of the "Times" writes under date September 7:—Further particulars are published by the "Journal de Mons" regarding the negotiations pending between the Charleroi glass-workers and the American Glass Window Company. According to this source, the trust stipulates for the purchase of at least one-third of the total capital of the various factories; and to make this operation valid it must be accepted by a sufficient number of glassworks to represent three-fourths of the total output of the district. On this occasion the Americans would also consent to incorporate in the trust factories which they do not financially control. On the other hand they do not limit themselves to the purchase of one-third, but are ready to consider any other offers if the price is suitable. As far as a practical realisation of the project is concerned matters are already well advanced, and many of the leading factories are now past the stage of initial discussion and are drawing up the details for a definite settlement of the transaction.

THE Paget Prize Plate Company, Ltd.—This company has been registered by Stephenson and Co., of 31, Lombard-street, E.C., with a capital of £80,000 in £1 shares, of which £48,000 are 6 per cent. preference shares. The objects of the company are to adopt an agreement with G. C. Whitfield, W. J. Wilson, G. S. Whitfield, and E. A. Whitfield, for the acquisition as a going concern of the business now carried on at Watford and elsewhere, under the style or firm of the Paget Prize Plate Company, Ltd., and to carry on the business of inventors and manufacturers of and dealers in photographic apparatus, materials, and accessories of all kinds, chemists and druggists, drysalters, oil and colour merchants, assayers, carpenters, printers, glaziers, lithographers, engravers, designers, and dealers in cements, papers, glass, oil, and paint, pigments, varnishes, drugs, dye wares, and chemical, scientific, and artistic apparatus, etc. There will be no initial public issue. The number of directors is to be not less than two nor more than seven. The first are G. C. Whitfield, W. J. Wilson, G. S. Whitfield, and E. A. Whitfield. Qualification £1000. Remuneration as fixed by the company. Registered office, St. Albans-road, Watford, Herts.

GERMANY'S Industrial Crisis.—"Germany, which has ever been upheld as an example of all that is prudent and cautious," writes the "Scientific American," "has over-reached herself. The failure of one of the largest banks in the empire and the severe drains to which the others are now subjected are the direct result of the over-production which began almost with German prosperity itself. The banks were only too ready to lend money for industrial purposes—so ready, indeed, that many of the factories in the empire are either owned outright by the banks, or are heavily indebted to them. Works of all kinds sprang up; the banks furnished the money for tools and costly plants. While trade was brisk the works were busy enough filling orders, and no evil effects were apparent. But trade is never constant. At the first wave of dullness in the market the German manufacturers began to suffer. All ready money had been invested in shops, machinery, furnaces, tools. The banks clamoured for the interest on their loans; but no money was forthcoming. Finally the Leipziger Bank failed for an enormous

sum, dragged down by the firms to whom it had advanced money, and who could not pay the interest on these advances. Other banks are now suffering from the financial depression which followed the building of more works than Germany needed to meet demands of the foreign buyers of her goods. Thousands of men have been thrown out of employment, and promise to be a political thorn in the side of the Government."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
15	South London	Excursion: Epping Forest. Leader, Geo. Brown.
16	Bradford Photo. Society	Open Night
16	Walthamstow Photo	Ordinary Meeting.
17	Croydon Microscopical	Ordinary Meeting.
17	Gospel Oak	Holiday Papers, illustrated with lantern slides. Messrs. Reid and Smith.
18	Borough Polytechnic	Monthly Print Competition.
19	London and Provincial	Paper by the Hon. Secretary.
20	Croydon Microscopical	Photographic Conversational Meeting.
21	Borough Polytechnic	Excursion: Round the *Nore* Lightship. A. Seduing.
21	Hull	Excursion: Brough.
21	South London	Excursion: Claygate.
21	Walthamstow Photo	Excursion: The Docks.
21	West London	Excursion: West Drayton and the River Colne.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 5,—Mr. W. T. Wilkinson in the chair.

A requisition for a special general meeting, signed by eight members, was put in, the purpose being to consider certain suggested alterations of rules so as to provide that a newly elected candidate is not in possession of membership rights until the payment of his first subscription.

Mr. Walter D. Welford showed a few slides, and drew attention to the fact that the cover glasses bore various border designs of a floral character, and others in the shape of picture frames. The designed cover glasses were produced in carbon, and all one had to do was to mount and bind them in contact with one's photographs.

A number of slides by Mr. York were also shown, special attention being invited to the toning, which was offered for criticism. In some cases the slide bore evidence of double tones, other seemed too plum-like in the shadows, and, as a rule, there was a want of softness about them that, with the colours prevailing, did not altogether commend them.

Mr. A. L. Henderson and Mr. York also showed some Oxford Convention slides, those of the latter being in and about Oxford, while Mr. Henderson's were on the excursions, notably to Abingdon by river. Mr. Henderson confessed a preference for the slower lantern plates on account of the far better quality that they gave to the image. Amongst the pictures was one of a large sun-dial constructed upon a lawn, the divisions marking the hours being made of various flowers and plants, whilst the indicator itself was ivy-covered, the whole looking very effective. The miscellaneous slides came to an end with a few by a lady pupil of Mr. Henderson, the scenes being principally in and around Margate. He thought the work was very creditable for a beginner, and so it was.

Mr. Henderson then gave his lecture on "Leghorn," illustrated with some thirty-six views. Leghorn, or more properly Livorno, is a seaport some twelve miles south of the mouth of the Arno, and fourteen from Pisa. There is a fine square in the centre of the town, and many public buildings unfortunately not remarkable for elegance. The shipping here is of chief importance, and many pretty little bits were shown. There is a statue to Garibaldi in the town, and another commemorating some life-saving feat at sea, which strikes one as very cheap and puny. The English church is as unattractive as the rest of the buildings as regards ornament, although solidly built. It enjoys the distinction of being the first English church erected in Italy. In the churchyard are the tombs of several English people more or less known to the public, amongst them that of Smollett, the author of the comical "Humphrey Clinker," who died in 1771.

PHOTOGRAPHIC CLUB.

SEPTEMBER 4.—Mr. G. W. Tottem in the chair.

Mr. W. Wallis, of Melbourne, Victoria, formerly a member of the Club (1887-8) was present. At the Chairman's invitation he gave an account of the present status of photography in Australia. He thought that the Australian professional or commercial photographer was quite as up-to-date as his confrère in England. There was a keen competition going on where he had come from, and a comparison of figures and prices afforded a strange contrast. While all the material used in Australia was imported either from home or from America yet the best class of commercial or professional work, he could confidently say, compared very favourably with similar work here in England, and was done at considerably lower rates. Thirteen years ago the charges for such work were very well maintained at a high figure, but latterly the prices had rapidly gone down. He thought that it might be said that these lower rates paid as well as the English higher rates, because out in Australia there were more favourable conditions of light and a longer working day. The principal houses chiefly kept to one branch of work, but occasionally they extended it and embraced several classes of work. As a rule, however, the Australian photographer had to do all that was brought to him. Cabinet work, which has so largely replaced carte work in England, had given way in Australia to the "Paris panel," about $7\frac{1}{2} \times 5$, and the price for such work would be something like £1 per dozen. The old prices were £3 per dozen, but they had long since given way. Cabinets were about 15s. per dozen, and some firms were offering an enlargement in addition free of cost.

Mr. W. R. Stretton showed a negative with marks apparently due to insensitive patches on the plate.

Mr. F. A. Bridge thought that they were caused by some greasy, repellent substance on the plate, and so thought others present who examined the negative.

A question was asked as to the admissibility of wiping a wet negative with the hand, a duster, or blotting-paper in order to hasten drying. Opinion was in favour of the practice when it was desired to dry the negative quickly, and no arguments against were offered. "Fotonic" blotting-paper or a soft handkerchief were both advocated; and one member said that he dried films between two towels or tea-cloths.

Mr. J. W. Zahnsdorf said that if one opened the window sash a little and fitted in it a piece of wire gauze, the draught would dry negatives in about an hour.

The Chairman said that a piece of muslin thrown over the plates in the rack out in the open answered the same purpose, but the previous speaker said that there was then no draught, which was very essential.

The use of spirit was mentioned, but several did not like the effect it had on the film.

South Australian Photographic Society.—The annual meeting of the South Australian Photographic Society was held on Thursday evening, July 18. Three new members were elected, and two nominated for membership. The annual report was presented, from which the following is extracted:—"The membership is now 101, showing an increase of 17 during the year. Average attendance at meetings has been 30, not including a large number of visitors. One photographic excursion was held, the attendance being 28. The seventh annual exhibition was held at the Society's rooms from October 8 to 13, and was characterised by the press as 'decided advance on anything the Society has ever had before.' Owing to the generosity of one of the members the balance of incidental expenses did not fall upon the funds of the Society, and entailed no expense beyond the prize money. The Society having become affiliated with the Society of Arts, has the right to share that society's rooms, and has, by the courtesy of the Royal Society, obtained the use of the latter's large room on the occasion of lantern displays. A South Australian photographic journal, the 'Quarterly Record,' has been issued, under the able editorship of Messrs. F. V. Joyner and A. H. Kingsborough, and the Committee feels that it would do much credit to any society." The balance sheet submitted by the treasurer showed a credit balance of £15 1s. 10d. The election of officers resulted as follows:—Patron, His Excellency the Governor; President, Mr. A. H. Kingsborough; Vice-Presidents, Messrs. F. A. Joyner and S. Smeaton; Hon. Treasurer, Mr. J. D. Dixon; Secretary, Mr. P. H. Evans (care of the South Australian Chamber of Commerce, Adelaide, S.A.); Hon. Librarian and Assistant Secretary, Mr. R. B. Adamson; Committee, the executive officers and Messrs. C. F. Clough, A. W. Dobbie, J. Gazard, and H. P. Gill: Hon. Auditors, Messrs. W. A. West and H. H. Wight.

FORTHCOMING EXHIBITIONS.

September 20 to November 2.—Photographic Salon, Dudley Gallery. Egyptian Hall, London, W. Hon. Sec., Reginald W. Craigie, Dudley Gallery.

September 30 to November 2. — Royal Photographic Society. New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.

October 29 to November 2.—Rotherham Photographic Society, Drill Hall, Rotherham. Hon. Sec., H. C. Hemingway, Tooker-road, Rotherham.

November 6 to 8.—Hackney Photographic Society. Morley Hall, Hackney. Hon. Sec., Walter Selfe, 70, Paragon-road, Hackney, N.E.

November 23 to 30.—Glasgow Eastern Amateur Photographic Association, $12\frac{1}{2}$, Landressy-street, Bridgeton, Glasgow. Hon. Sec., G. R. Johnstone, 166 Slatefield-street, Dennistoun.

December 20 to March, 1902.—Corporation of Glasgow Photographic Exhibition and Competition. Hon. Sec., Peter Macnair, People's Palace, Glasgow.

Patent News.

THE following applications for Patents were made between August 19 and August 31, 1901:—

SHUTTERS.—No. 16,601. "Improvements in Roller Blind Shutters having an Adjustable Aperture." OSWALD NÄTHER.

DEVELOPING AND FIXING.—No. 16 637. "New or Improved Means or Apparatus for developing and fixing Photographic Plates, Cut Films, and the like." MAX REICHERT.
CAMERA.—No. 16,713. "Camera." CHARLES WESTON BARNEKOV.
FILM ROLL.—No. 16,791. "Improved Film Roll." GEORG SCHWEIZER.
CAMERA.—No. 16,879. "An Improved Photographic Camera." Communicated by J. B. G. Bonnaud. ALEXANDER BROWNE.
STEREOSCOPES.—No. 16,998. "Improvements in or relating to Apparatus for the Display of Stereoscopic and other Pictures, and for analogous uses." PEARSON JACQUES JACKSON and JOHN HUGHES.
SHUTTERS.—No. 17,076. "Improvements in Photographic Roller Blind Shutters having an Adjustable Aperture." RICHARD SCHÜTTAUF.
TONING AND FIXING BATHS.—No. 17,100. "Improvements in combined Toning and Fixing Bath for Photographic Purposes." Communicated by La Société Anonyme des Plaques et Papiers Photographiques A. Lumière et ses Fils, France. CLAUDE KENNEDY MILLS.
FILMS.—No. 17,283. "Improvements in the Manufacture of Photographic Films." HARRY OLDFIELD COOPER, JOHN REARDON, and WALTER BERESFORD.
MOUNTING PHOTOGRAPHS.—No. 17,327. "An Improved Process for Mounting Photographs, Engravings, and the like, and means for carrying the same into practice." LA SOCIÉTÉ DEREPAS FRÈRES.
DEVELOPMENT.—No. 17,352. "Improvements in Portable Devices for Use in developing Photographic Negatives." ROBERT ROBERTS.
PRINTING PAPER.—No. 17,471. "An Improved Photographic Paper." LA SOCIÉTÉ DEREPAS FRÈRES.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

TINTERN ABBEY.

To the EDITORS.

GENTLEMEN,—The enclosed cutting from a local paper will be of interest to many photgraphers:—"Photographers Barred.—Now that Tintern Abbey has been purchased by the Crown, the photographing of the beautiful old ruin is no longer permitted. It would be interesting to know the reason for this prohibition." There was no difficulty whilst the Abbey was in private hands in getting leave from the resident agent to photograph there. It seems strange that it should now be forbidden.—I am, yours, &c., CLIFFORD E. F. NASH.

Glenfall Lawn, Cheltenham, September 7, 1901.

[One of the pleasantest photographic afternoons we remember to have passed was at Tintern Abbey during the Gloucester Convention of 1899. On that occasion permission was given to the members present, to the number of between one and two hundred, to take photographs of the ruin. A protest from the Affiliation of Photographic Societies might induce the authorities to withdraw a prohibition that scarcely seems called for.—EDS. *B.J.P.*]

MANDARIN ORANGE FOR DARK ROOM ILLUMINATION.

To the EDITORS.

GENTLEMEN,—In THE BRITISH JOURNAL OF PHOTOGRAPHY for August 9, page 504, there is an article by Mr. W. S. Davenport recommending a solution of mandarin orange in place of the usual bichromate of potash solution for liquid filters for dark-room lamps. I have such a lamp burning gas, and provided with a glass cell about three-quarters of an inch inside measurement. With a saturated solution of bichromate of potash it gives a very good light indeed, and it is fairly safe for ordinary plates, as I think you will admit if you will examine the enclosed film (one of Austin Edwards's instantaneous). This film was exposed at about twelve inches from the light under the piece of black paper, also enclosed, from the centre of which a cross has been cut out. One arm of the cross was left uncovered two minutes, the middle four minutes, and the other arm six minutes. The film was developed in the dark for 15 minutes, with a pyro developer containing plenty of soda and no bromide, yet you will notice that the cross cannot be seen at all by transmitted light, and only faintly if the film is placed in contact with a piece of white paper. I thought, however, that I would try the mandarin orange filter, so I ordered an ounce from one of the large firms in Cross-street, E.C., specifying the Berlin Co.'s product. I received, however, 30 grammes of "mandarin orange, G extra," made by Dr. G. Grübler, of Leipzig, and the price was 2s. I dissolved—or rather, tried to dissolve—48 grains in 12½ oz. of water, which I calculated was the equivalent of four grammes, in 500 c. c., as given by Mr. Davenport, but the result was that not half the 48 grains would dissolve, and the solution was so turbid that the gas flame could not be seen through it. No doubt the light—what there was of it—was quite safe, but one might as well have had a candle behind two or three thicknesses of ruby medium.

Perhaps my arithmetic is wrong, or Dr. Grübler's mandarin orange is essentially different from the Berlin Co.'s. At any rate, something is wrong, and perhaps Mr. Davenport will kindly give his opinion.—I am, yours, &c., REX.

[Mr. Davenport, who resides abroad, will no doubt favour our correspondent with a reply. The film send by "Rex" viewed by transmitted light is perfectly unveiled either locally or generally.—EDS. *B.J.P.*]

THE BACKING OF PLATES.

To the EDITORS.

GENTLEMEN,—I was much interested in the letter from M. Albert Levy in your last issue concerning the backing of plates, and some curious effects which he and others have noticed are not avoided by backing. The subject is one to which I have devoted a certain amount of thought and experiment. Firstly, I notice M. Levy remarks on the apparent uselessness of a black backing he has tried, which he thinks may consist of Indian ink. I believe he is right in this supposition, and have come to the conclusion that the halation, in this case, is due to the fact that Indian ink dries with a glossy surface, which, of course, is still more accentuated on a polished glass plate, forming, in fact, nothing else than a reflecting plane, and so being quite useless for its purpose. It is fairly obvious that only preparations drying absolutely dull are suitable. Secondly, M. Levy comments on some troubles apparently due to halation, which backing seems powerless to prevent, and mentions, in particular, an annoying narrow light margin that often comes round the outlines of light objects taken against a dark background and vice versâ. Now, I have often had strong doubts whether such effects can fairly be called photographic at all—doubts which a little research has by no means tended to dispel. As an example, if any one will take the trouble to carefully notice the appearance of a line of dark buildings silhouetted sharply against the sky on a bright evening, he will probably detect a narrow margin of light round the outlines, an effect which, if photographed without keen examination, would doubtless have been wrongly ascribed to halation. If such a thing is natural in the object photographed, all the backing in the world will, of course, never prevent it appearing on the negative. The same thing can often be detected when a pure white dress is taken against a very dark background, and is evidently an optical rather than a photographic phenomenon. Finally, it must not be forgotten that light can always act laterally among the molecules of silver bromide in the sensitive film, thus sometimes causing a spreading which backing is equally unable to prevent.—I am, yours, &c., A. LOCKETT.

88, Brook-street, Kennington-road, S.E., September 9, 1901.

THE METRIC SYSTEM.

To the EDITORS.

GENTLEMEN,—Your correspondent, "J. D." has omitted to make any allowance for temperature in estimating the number of cubic centimetres in one ounce. One c. c. of water weighs one gramme at 4.5 C., and is equivalent to 15.432 grains, but there are more than 437.5 grains to the fluid ounce of water at 4.5 C., hence the error he has fallen into. One ounce avoirdupois weighs 437.5 grains at 62°, and at that temperature a cubic centimetre of water weighs less than a gramme. The standard tables of equivalent weights allow for the temperature variations.

The temperature at which the cubic centimetre and gramme are in agreement is that at which water has a maximum density, and at which it forms the unit of specific gravity. The English ounces agree at a mean working temperature, and it has always seemed to me that the low temperature selected in the metric system is a practical mistake, for it is too low for the making of solutions. At an average working temperature the cubic centimetre weighs less than a gramme, so the standard relationship between the two disappears.

It is hardly possible to translate solutions made by weight and volume from one system to the other in a workable fashion, and, if it is desired to use both systems of weights, solutions should be made by weight only; then all troubles disappear.

Exact translation is desirable with such things as emulsion formulæ, but I fail to see the smallest advantage in it with developers. In many cases you only convert a convenient formula into an inconvenient one that cannot be carried out with any exactitude, and I should much prefer to see the various formulæ in the ALMANAC converted simply by substituting half a grain for every gramme, and one ounce fluid for every 1000 c. c. This is only an approximate method, but the results differ only in the degree of dilution, and only to an extent that can be ignored. As a matter of fact, the difference can be made up, if thought necessary, by adding 47½ minims of water to every ounce of the solution, which is an easy, though apparently roundabout fashion of making up a metric formula with the aid of

English weights. This, however, may fairly be looked upon as an unnecessary refinement in the case of a developer, as no doubt we commonly make a mistake of a drachm or so in filling up the measure in the dark room.

If we ignore the ultra refinement of temperature it is, of course, easy to make up a solution from a metric formula by substituting the ounce avoirdupois for the gramme, and the fluid ounce for the cubic centimetre. The only objection is that the ounce is too big a unit, and so we have to divide all quantities by some factor to produce a convenient result. I have often thought that the revival of the old avoirdupois drachm and scruple would be a great convenience to photographers; it would, in fact, clear away many of the disadvantages of our English weights. The drachm would correspond to the fluid drachm, while we might apply the term "fluid scruple" to a quantity of 20 minims, which would agree with the avoirdupois scruple. These scruples would also be conveniently near the bulk and weight of the cubic centimetre and gramme, and would form very convenient units for conversion. If then we cultivated the habit of working with solutions of definite percentage strength we could drop the grain altogether. The grain appears to be the chief origin of all our trouble, and if it had never existed, or had been fixed as the one-four-hundred-and-eightieth part of an avoirdupois ounce, we should have been much happier. We have, however, to thank very remote antiquity for the invention of the two incompatible units of the ounce and the grain.

I was interested a short time ago to find in some old tables of weights and measures that not very many years back we had a unit of weight equivalent to the one-two-hundred-and-forty-thousandth part of a grain. Those who used it very sensibly called it a "blank," but their descendents very much more sensibly abolished it altogether.—I am, yours, &c.,

C. Welborne Piper.

To the Editors.

Gentlemen,—Your correspondent "J. D." in your issue of September 6 has omitted to notice that the table at page 583 of the Almanac is copied from the official table issued by the authority of the Privy Council; he should therefore apply to the Standards Department of the Board of Trade for a solution of his difficulty.

But I will endeavour to save him some trouble. Nothing was ever made by human hands perfectly accurate, consequently it was not to be expected that the metre made with imperfect knowledge of the dimensions of the earth should have turned out to be exactly what it purported to be, nor that the litre should turn out to be equivalent in weight of water to exactly one kilogramme at the specified density. As a matter of fact, it has been found out that the advances of science and mechanics have led to corrections of these fundamental data which were quite sensible in a scientific sense, though of no practical importance. Recently (comparatively) an International Committee was assembled to form international standards, and they determined to make no changes in the standards of the metre, kilogramme, and litre, but to make copies of them as accurately as possible, but of the most durable materials now known, and to distribute these, after selecting certain exemplars, as international standards. One copy came to England, and is our standard of the several units. By comparing these with our English standards as accurately as our modern means allow, the figures given by the Privy Council notification were derived. In theory the litre was one cube decimetre of pure water under certain conditions; careful investigation shows that more accurate values can now be made; hence the cubic centimetre of water no longer is to be considered as exactly one gramme in weight, and nothing would be gained if it were made so, because the conditions under which this exact equivalence would exist are such as cannot be used in practice, nor would it be possible to make standards which would retain their relative values under all the varying circumstances of daily use. For all practical uses the values are good enough. If "J. D." will take the trouble to measure out several c. c.'s of distilled water he will find probably discordances in their weight far greater than those he inquires about.—I am, yours, &c.,

J. F. T.

To the Editors.

Gentlemen,—In your issue of August 30 a letter appears from Mr. Parker re my article, "English and Metric Weights and Measures," which, with your kind permission, I should like to answer, and, as I will not trouble you further on the matter, shall thank you in anticipation for inserting this. Mr. Parker complains because I converted a formula from English to metric measure, rather too literally, forgetful of the fact that possibly there might be some among my readers whose arithmetic (like Mr. Parker's, on his own showing) is faulty, this probably accounting for his assertion "that he has given the Recording Angel a lot of extra work." Possibly I did not make myself so explicit as I ought to have done, and I am willing to be responsible for any literary failings, but cannot see that it is my fault English weights and measures will not convert to metric or vice versâ, without fractions. Mr. Parker might like to take exception to this earth because it did not complete its year in 365 or 366 days exactly and in his calculations, by ignoring the fraction, "give the Recording Angel a little more work," but he would find the earth going neither faster nor slower on that account, and I think he stands just as much chance of converting English and metric weights and measures from one system to the other without using fractions. His remarks re "weights which are not in practical use" are somewhat beside the mark, as in giving a table of weights and measures it is usual to give a complete one and not a mutilation to suit the writer's whims and fancies. The formula he takes exception to was given as a photographer's formula, and not for buying butter and sugar, or it would not have been given in grains or milligrammes. Should Mr. Parker have occasion to make up a chemical or photographic formula he may find it necessary to use these weights; but if he has tried them for butter and sugar I can quite account for "the extra work of the Recording Angel." Mr. Parker says "stern necessity keeps him in this country," and probably the same stern necessity keeps him on this globe, where he is likely to be still further troubled with fractions of some kind unless he can find a land in which "vulgar fraction cease from troubling, and decimals are at rest." It is certainly unfortunate that Mr. Parker cannot make up an uncommon quantity without having a special measure, whether "out of a museum" or not, and I hope he will find a way of converting different weights and measures without using fractions, or the compliments (?) he so freely distributes in his letter.—I am, yours, &c.,

C. T. Sutton.

114, Akerman-road, Brixton, September 5, 1901.

DEALERS AND PLATE-MAKERS.

To the Editors.

Gentlemen,—I am pleased that Messrs. Mason have opened the subject of plate-makers supplying their customers direct; I have also had to complain of the same treatment. I find also that makers of photo mounts have betrayed the confidence placed in them by the dealer, and, after executing orders received from him, have called on the customer and offered the mounts at lower prices.

One firm who are supposed to supply the wholesale trade only are now advertising under an assumed name to supply the retail trade, and thereby robbing the dealer of his business. Is this fair or honest? —I am, yours, &c.,

Fair Play.

PSEUDOSCOPIC VISION WITHOUT A PSEUDOSCOPE.

To the Editors.

Gentlemen,—Referring to your extract from "Nature" (page 537), in which Professor R. W. Wood describes a method of pseudoscopic vision, headed "New," and as producing the most startling illusion he has ever seen, I beg to say that I used to practise it—without the preliminary lead pencil—quite thirty-five years ago, but, being unable to describe the method by which the illusion was obtained, and being apprehensive also of the retributive hand of the powers that then were, I do not remember ever mentioning it to any one, and this is the first time I have seen a similar illusion described, and perhaps the lead pencil addition may enable others to accomplish it. The fact is, I used to do it in church. Being young and thoughtless, and always finding the sermon far from exciting, I acquired great dexterity in the art. The subject was a large four-light window at the opposite end of the church from where I sat, with tracery in the window arch above, the background being sky and trees. The panes were diamond-shaped. By a slight convergence of the eyes, quite easy to do, but which I cannot describe in words, the lines forming the diamond-shaped pattern suddenly appeared as a screen of thick wire, placed, apparently, a little nearer to me than half the distance between me and the window. The masonry does not assert itself in this. By a trifle more accommodation of the eyes there appeared in front of this wire screen, and but about five or six feet away from me the four lights merged into three, the diamond-shaped screen being seen indistinctly behind it. A further attempt and the three lights resolved themselves into two. I well remember the delight I felt when, after being content with this achievement for a long time, I found that the two lights could be coalesced in one. Further than this I could never get. I said that I acquired great dexterity in this art. I became able to undo the combinations, one or more at a time. The one-light was turned into two, the two into three, and so on, until the real window was arrived at.

Now, lest my recollection of these illusions should be thought to be a delusion, I have been down to the church to-night, and have repeated every item without the least difficulty, including the making and the unmaking of the images. In the making each image became much smaller as it approached me, and the distance which each one advanced became rapidly less. The two-light combination could easily be reached with the hand, and, as Professor Wood says, "it is not there, the finger falls on empty space." The final one-light combination appears to be but a few inches away, and is a small image, very small as compared with the earlier ones in the series.

If this communication should prove to be of any interest to Prof. Wood I might attempt to give particulars of details which appear in the combinations, showing which of the lights of the window go to make up the images. For instance, a portion of one of the lights opens for ventilation, and has thicker iron work round the opening. Bearing in mind that there are four lights in all, there are two images of this opening in the three-light combination, one in the two-light, but no trace of it in the final one-light. All these images are visible at the same time, but only one is distinctly seen, and it seems so real and solid as to induce one to think it might be photographed. There are also interesting variations of the curved tracery above the lights in connection with each of the combinations.—I am, yours, &c.,

A FELLOW OF THE ROYAL PHOTOGRAPHIC SOCIETY.

September 7, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

P. W. Morehen, 12, Shakespeare-road, New Brompton, Kent. *Photograph of group of sailors.*

A. C. Jervis, Station-road, Beccles, Suffolk. *Photograph of opening of St. Benet's Minster, Beccles.*

W. Duncan, 17, High-street, Kirkcaldy, Fifeshire. *Puzzle photograph entitled "The Man in the Rock."*

R. O'H.—The firm you name is still in existence. No doubt the matter referred to was an oversight.

INDEX TO THE JOURNAL.—W. C. (Watford).—The index is as full as formerly; but that for the current volume will be fully amplified.

W. H. B.—Thank you for the name of the firm, which we shall keep in mind. Kindly send us a report of the case when it is tried. Thanks also for proffered services.

SALE.—We really do not see that you have much to complain of. The fee you have paid was for registration and advertisements. If the business does not sell, that is not the fault of the agent. Of course, he does his best to dispose of it in order to obtain his commission. If, as he says, you have over-priced it, it is not surprising that he cannot effect a sale.

GLASS.—We fear such an article as you suggest would not be appreciated by the bulk of our readers, inasmuch as they know how to fit up a room to suit their requirements. The kind of glass that is most suitable will, of course, depend upon the aspect of the room. Your experience with formaline is different from that of most others. As alum answers better in your hands we should advise you to continue to employ it.

PHOTOGRAPHY FOR THE PRESS.—"ENQUIRER" writes: "I should be greatly obliged if you could supply me with name or names of agents who undertake to place photographs with leading pictorials for the purpose of reproduction, at a commission?"—In reply: So far as we are aware there are no agents for this kind of business. We think the best way will be for you to submit the photographs, with your fees if they are accepted, to the different illustrated journals.

WATCH CASE PHOTOGRAPHY.—H. JOY writes: "Will you kindly inform me as to the best method of transferring photographs to watch-cases and dials, also how to place photographs on chloride papers on metal substances such as watch-cases? I have seen some of a red tone. Is there any book treating on this process?"—In reply: The method of doing this class of work was fully described in the JOURNAL for July 19 last, to which we refer you. There is no book dealing with the subject published.

COPYRIGHT.—"GROUP" writes: "Can the President of a cricket, football, bowling, etc., club assign the copyright of a group of his club to the author (photographer taking it) without the consent of his club? The said President ordered the group to be taken on his own responsibility, and the photographer risked the quantity of copies required; or would the President be able to assign the copyright, as it would be wanted quickly, and there would not be time to get the consent of all the members (or committee)? The group was copied whilst being exhibited in my showcase. Would the copier be trespassing in any way by doing this mean act?"—In reply: If the President is the owner of the copyright—though we do not see how he can be—he can, of course, assign it to any one unless you made an agreement with him to that effect. He has no copyright in the picture, as he did not pay you for taking it. There is no trespass in the case so far as you are concerned.

GELATINE SOLUTIONS.—R. A. BEEMAN writes: "I am desirous of making a moist gelatine coating for paper for certain style of work, and find that when I mix glycerine with soft gelatine I cannot get the solution to remain on the paper support. Bichromate of potash will not do, as the coating will be made insoluble. Being quite a beginner, I venture to ask your opinion as to what to add to the solution?"—In reply: We do not know of anything better than glycerine for keeping gelatine moist. Possibly you have used too large a proportion. Bichromate of potash will not render gelatine insoluble unless it is exposed to light, or it is kept for some time before use.

THE ROYAL ARMS.—"YOUNGSTER" writes: "(1) In starting business, could I advertise that I was 'lately with So-and-So, Royal Photographers' (of the same town)? If I placed letters on my window to the above effect could my late employer interfere? In short, should I be legally in the right? (2) How should I obtain permission to use the Royal Arms? I won a medal at an exhibition at which her Majesty the Queen was patron. I made application to her Majesty to allow me to stamp on medal the Royal Arms, etc., but I had answer back to say that H.M. regretted, but was not in her power. Any use me applying to Heraldic Office, do you think? I may say Royal Arms were on all the printing in connection with exhibition?"—In reply: You will be perfectly within your rights in saying that you were lately with So-and-So if you do not do it in such a way as to lead the public to suppose that the business you are carrying on is theirs. You must have their names much less prominent than your own. (2) You certainly will not be able to use the Royal Arms. To do that you will have to obtain the Royal Warrant, and that you are not at all likely to get on the ground stated in your communication.

VARIOUS QUERIES.—"STUDIO" writes: "(1) I have a price list of ——'s which is advertised in the JOURNAL every week. Their prices for portable studios, etc., agree with my purse all right, but their terms are cash with order. I thought once to send them £10 for one, but before doing it will you please let me know if I can trust this firm? Is it genuine? Which is the best plan for me to send the money to be on the safe side? (2) In formula for toning carbona P.O.P. (Griffin), it is gold, acetate, and borax. Will this solution keep for a long time, and can it be used over and over again by using more gold, same as a sulphocyanide bath, and how soon can it be used after mixing? (3) Can you name me a firm who makes and sells gem and midget lenses? I have Fallowfield's."—In reply: (1) If the terms are cash with order we surmise you will have to conform with them. The money may be sent as a crossed cheque, made payable to order; or it may be sent by Post Office order, which may also be crossed. (2) This toning solution will not keep long when mixed. It should be used within an hour or so of mixing. (3) All the large houses supply these lenses.

LENS QUERIES.—"SUPPLEMENTARY" writes: "(1) Last Wednesday I was photographing at 6.20 p.m. a view through trees, with a quarter-plate stand camera and an 8 in. focus Busch Aplanat, but was prevented taking the view I wanted, as I noticed a reflection of some kind on the screen. I am assuming that the plate is inverted; the stop that I was using was f-8. I write to ask how it was that I saw this large circle on the screen? Was it due to my pointing the lens so that the rays of the sun were shining at an angle into the lens, and, so under the same circumstances, would be the same with any lens; or is it due to an inherent fault of the lens, as the one that I am using is quite new, and has been passed as a really good lens by a person who examined it, and the dead black is certainly not worn off? I think it must be due to my pointing the lens to the sun, and would be the same with any other lens. Kindly explain. I might add that when I moved the camera the large yellow outlined circle disappeared. (2) I have a wide-angle Planiscope lens, which approximately reduces the focus of the 8 in. Busch lens to 6 in. focus. I understand that the f-8 of the iris becomes stop f-6; this being correct, if the iris pointer is (A) put a little before f-11, it should then =f.8, but (B), the other stop on my iris, being f-16, f-22, f-32, f-45, f-64, whereabouts in relation to these numbers do they become two less all through—f-14, f-20, f-30, f-43, f-62, as f-8 became f-6? Must I now, when the wide-angle Planiscope is applied, put the pointer so that I may obtain the same definition as the normal Busch lens gives at these various apertures? Thus if I desire when the Planiscope is applied to use f-11, or f-16, or f-22, where must I place the pointer (or approximately)? (3) Are the so-called Planiscope or supplementary lenses anything more than single double-convex spectacle lenses, and, if so, if I desired to reduce my 8 in. focus R.R. to 6½ in. and 7 in. respectively, what would have to be the focus in each case of the supplementary lens?"—In reply: (1) The cause of the spot is that suggested. Any lens would give a similar spot if used under the same conditions. (2) This is, approximately, correct all through, so that the aperture marked on the iris index will be correspondingly enlarged, and be allowed for in the adjustment. (3) The Planiscope lenses are constructed with great care, and, especially with a view to their application, than are spectacle lenses, and are therefore preferable. We should advise you to get suitable Planiscope lenses fitted to the lens. You will probably then find that a larger aperture may be employed than when a common spectacle glass is used.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

The Position of Modern Chemistry.

In his address to the Chemical Section of the British Association at Glasgow, Professor Percy Frankland took for his text, "The Position of British Chemistry at the Dawn of the Twentieth Century." After alluding to the foundation of University Colleges in various parts of the Empire during the latter portion of the last century, and the impulse they gave to original research in chemistry, he gave, for comparison, a diagram of the publications of the Chemical Society of Berlin since 1867, which showed how much this country lagged behind Germany in chemical research. He complained that these Colleges were not founded or maintained by the State, but by private liberality, and that was inadequate for the purpose. He said that even now only a minority understood that to starve higher education was a national loss; but it was becoming more and more widely recognised. There can be no two opinions that Germany has been far ahead of us in the matter of chemistry. Take only, by way of example, the coal-tar colours. At first this business was entirely in our own hands; now the whole of the busi-

ness is practically in the hands of Germany, and that is, to us, what may fairly be considered a national loss, for the trade is large, and a highly remunerative one. The first works established here for the manufacture of coal-tar colours were at Greenford, and when we passed them a few years back they were a dreary waste, with only the chimney stacks and a number of large dilapidated buildings to illustrate the extent of manufacture that was once carried on there. The manufacture of glass for optical purposes is another illustration. At one time England stood above every other country in its manufacture; now Germany takes the lead. It is certainly time that the State took into consideration the question of chemical research, as other countries have done; but we fear that when the question comes before Parliament there will be a considerable number amongst its members who will be opposed to a grant of the necessary money for the work, and so we lag behind in the higher branches of science.

* * *

The Collodio-chloride Process. It will be remembered that in our issue for the 30th ult., we referred to a discussion at one of the societies as to the permanence of collodio-chloride prints, and made mention of prints we had recently seen that were made soon after the process was first introduced by the late Mr. G. Wharton Simpson. We also made mention of some pictures, lent by Mr. G. Bruce, of Duns, which were shown at the Victorian Exhibition, done something like twenty-eight years before. In our last our friend, "Free Lance," points out what he considers "a possible source of error." In the first place he insinuates that Mr. Simpson was not the inventor of the collodio-chloride process. We are quite aware that at the time of its introduction there was a somewhat acrimonious controversy on the subject, but after all had been said the fact remained that Mr. Simpson was the first to bring forward and publish a practical working collodio-chloride process, which he did in a paper that he read before the London Photographic Society —now the Royal—on March 14, 1865. In that paper he gave full working instructions for the preparation of the paper, the toning of the prints with the sulphocyanide bath, and the fixing, and showed at the meeting some fifty specimens toned to different colours to illustrate the various tones that could be obtained. The process was for a time known as "Simpsontype." Our friend rather questions if the prints to which we referred were on collodio-chloride paper at all. He mentions a paper that was introduced from Germany under the name of "Aristotype," which was, we think, the first gelatine P.O.P., which he says many imagined was a collodion paper. This paper was a later introduction than the collodio-chloride, and we think that few practical photographers imagined, when using "Aristo," that they were employing a collodion paper. "Free Lance" says he has no recollection of a German collodion paper being sold twenty-eight years ago. We fear our friend's memory fails him on this point. If we turn to our volume for 1874, pages 196-7, we shall find a paper by Mr. Geo. Bruce, the gentleman whose pictures we referred to as being shown in the Victorian Exhibition, that was read at the London Photographic Society, April 14 of that year. Referring to some pictures he had shown at the previous exhibition, Mr. Bruce says:—"The pictures I sent to the exhibition were, as I said before, printed upon collodio-chloride paper prepared by Herr Obernetter, of Munich. That gentleman has supplied this paper to photographers for some years past; and, as ever since he began to manufacture the material, I have used it, I have improved considerably in working the material." At the conclusion of his paper, the author says:—"I must also express my surprise that the manufacturers of photographic papers in this country should still leave those of us who wish to print our work by this process to get the material for the purpose from the Continent. . . . . Meanwhile, until a manufacturer in Britain will make a first-class collodio-chloride paper, those who are desirous of trying the material may obtain it of good quality from Herr Obernetter, of Munich." We should not have referred to our friend "Free Lance's" comments were it not that, in all matters of historic interest that may, possibly, be handed down to future generations of photographers, they should be really authentic.

* * *

Persulphate of Ammonium and other Selective Reducers. Messrs. Lumière have made a series of comparative tests with reducers of the oxidising type, and the results have recently been published in the "Bulletin de la Société Française." The claim that persulphate of ammonium preferably attacks the denser parts of the negative is fully confirmed, and the tests also show that in this respect it is superior to permanganate of potash acidulated with sulphuric acid, ceric sulphate, ferricyanide of potassium and hyposulphite of soda, and bichromate of potash and sulphuric acid. Plates were exposed to show a series of gradations in bands, and the steps varied from a very slight to a very opaque deposit of silver. The negatives were cut transversely into a series of strips, and these, after treatment with the various reducers, were compared, the steps of gradation being arranged so that the densest of such series were equal to each other in intensity. The reducers were used in the following proportions:—

1. Persulphate of ammonium, a 4 per cent. solution.
2. Permanganate of potash ½ gramme, sulphuric acid 1 c. c., water 1000 c. c.
3. Ceric sulphate, a 5 per cent. solution.
4. Ferricyanide of potassium 5 grammes, hyposulphite of soda 50 grammes, water 1000 c. c.
5. Bichromate of potash 1 gramme, sulphuric acid 1 c. c., water 1000 c. c.

Various developers were also used for separate series, viz., Diamidophenol, hydramine, diamidoresorcine, hydroquinone, oxalate of iron, paramidophenol, and pyrogallic acid with acetone. The reproductions of the negatives, published in the "Bulletin," show six steps of gradation. In each, reduction with ammonium persulphate preserved the six steps, but the densest is weaker than in the strip left intact for comparison. On the diamidophenol negative, two steps of gradation are lost by use of each of the other reducers, and on the hydramine, diamidoresorcine, hydroquinone, oxalate of iron, and pyro-acetone negatives one step is lost. In the case of the paramidophenol negative there appears to be scarcely any difference between the persulphate and the other reducers. Messrs. Lumière remark with regard to this that the action of the persulphate of ammonium appears to be

completely reversed with a paramidophenol negative, and that the shadows retain less detail than in the case of other reducers. It might be assumed that paramidophenol renders the gelatine insoluble in the denser portions of the negative, but as pyro-acetone does not show the same peculiarity, notwithstanding the tanning properties of pyrogallic acid, the cause must be sought elsewhere. Messrs. Lumière have noticed the following peculiarities in relation to persulphate:

1. Persulphate acts more quickly upon a wet than a dry negative.

2. Its action does not begin until some time after immersion of the negative, and it then proceeds steadily; whilst with the other reducers, action is set up as soon as the negative is placed in the bath.

3. Persulphate continues to act after the negative is taken from the bath, and its action must be stopped by a solution of sulphite, or alkaline bisulphite; the other reducers cease action as soon as the negative is taken from the bath and washed.

4. There is no difference in the final result whether a strong or weak solution of persulphate be used; a strong solution only increases the rapidity of the process; in the case of other reducers the results vary according to strength of solution.

5. The veil due to over-exposure or over-development is not much affected by persulphate, but it is removed by the other reducers.

* * *

The Oldest Observatory in Europe. According to the "Central Zeitung für Optik und Mechanik," it seems possible that the Vatican may claim to have possessed the first European observatory. In 1582, a tower was built at the Vatican for observing the heavens, and, according to Crescenzi, who wrote an important work on astronomy, Pope Gregory XIII. was the person to whom the credit is due of having built it. Probably the work was undertaken in connection with the reform of the Calendar. This fact is but little known, and 1888 is usually supposed to be the date of the founding of the observatory. A short time ago we drew attention to the fact that a rich American had offered to present the Vatican with a giant telescope, and it is said the instrument will be even larger than that shown at the Paris Exhibition. The "Central Zeitung" states that a large number of the instruments at the Vatican, including the fine telescope by Dolland, were presented by Cardinal Zelada over one hundred years ago. The observatory has had great changes of fortune. Under Philip Gili, who had charge of it for thirty years in the early part of the last century, its reputation stood very high. Gili died in 1821. The instruments were then scattered, and the observatory remained empty and neglected. Pope Leo XIII., on the celebration of his jubilee as priest, in 1888, collected the instruments once again, and since then the observatory has entered upon a new period of prosperity. It is now furnished with the most modern apparatus, and will bear comparison with any other European observatory.

* * *

Photographic Post-cards in Germany. A short time ago we drew attention to the ridiculous state of the law in Germany in relation to the copyright of photographic post-cards. But if the photographer has no protection, the sitter is not in quite the same helpless position. A lieutenant in the spring of this year made a bicycle trip in mufti, and, having made the acquaintance of a fair bicyclist, they decided to be photographed together. The photographer was a man of speculative temperament, and unkind enough to include the print with others which he submitted to a publisher of picture post-cards. The lieutenant and the damsel found favour with the publisher, and an order for 10,000 post-cards decorated with the photograph was executed for a firm in Berlin. The city was flooded with the cards, and not a day passed without the lieutenant being greeted with the verse the publisher had dedicated to him: "What greater delight than to fly through the world with you, darling, wheeling beside me?" This was too much for the sensitiveness of the Prussian lieutenant, and he was compelled to appeal to the law. The photographer was fined £25, and the publisher £10. An order was also made for the calling in and destruction of the cards, plates, &c.

* * *

The Value of Photographs. "Apollo" gives some interesting particulars concerning the sale of the late Duchesse de Castiglione's effects. The pearls of this celebrated beauty of the Court of Napoleon III. realised 580,000 francs, but it will be more interesting to the photographer to learn that the Duchess was an enthusiastic patroness of photography. Excepting the Princesse de Chimay, perhaps no other woman in the world has been photographed so much as the Duchesse de Castiglione, and the Parisians were delighted to see the large collection of her photographs at the sale at the Hôtel Drouot on June 29. Of this vast number of photographs in every possible style—coloured, faded, framed in satin, embroidered with gold—scarcely one fetched less than 80 francs, and many found buyers at 200 to 230 francs. The Duchess was especially proud of the beauty of her hands and feet, and a photograph with limbs bare to the knee fetched 70 francs. A small album containing sixteen photographs in various styles realised 180 francs. It may, however, be remarked, as a contrast to the notorious photographs of Chimay, that none of these photographs overstepped the limits of propriety.

CONCERNING BACKGROUNDS.

The subject of backgrounds is one of considerable interest to the professional photographer, who knows full well how much of the success of his pictures depends on them, not only in an artistic sense, but also in the more mundane one of the extent to which they please his sitters and help to extort that which, however it may be abused as the "root of all evil," is, nevertheless, a most desirable and necessary possession. There was a time when a photographic background was a thing apart, unlike anything else whatever, a kind of unhappy cross between a tenth-rate theatrical drop scene and the paintings that ornament a travelling caravan. Those of us who happen to have any accumulation of bygone studio appurtenances, that we are always thinking of getting rid of, yet never do, may occasionally in a spirit of curiosity unroll one of these primitive backgrounds, wondering greatly at the extraordinary lack of taste that could have rendered possible the use of such an overwhelming piece of ugliness. Things are different now! The painting of backgrounds

has attained to the dignity of a fine art, and we can, if we know how to choose, possess them executed with a skill and beauty that would not disgrace the walls of the Royal Academy. And this is where the temptation comes in that in so many cases leads to the execution of bad work. The background is allowed to become the principal object of attraction in the picture, a thing that has never yet been done with any fair approach to success. It is imperative that in a portrait, the sitter should come first, and that nothing else should take to itself an undue amount of attention. And yet we see so many photographs, in other respects good, which set this wholesome rule at defiance, in which, indeed, the background and accessories might almost be said to demand all our notice, the sitter being merely thrown in for form's sake. If we call attention to such lapses from the right path, the perpetrator will probably reply, "Oh, yes, of course I know it's wrong; but what are you to do? The public like it, and one must live!" An unanswerable argument, certainly, if true; for however attractive and satisfying high art ideals may be in the abstract, they have, alas, to be thrown overboard without compunction, if they happen to clash with that first law of human nature, which prevents a man from committing passive suicide. Is it really true, however, that it pays to bring all our work down to the low level of intelligence of a few vulgar-minded clients, rather than follow the road which our own better judgment would lead us to take? After all, is it not fairly evident that, broadly speaking, the men who are doing the best and most artistic work are, at the same time, the possessors of the most profitable and remunerative businesses? There may be something in artistic knowledge and ideals that is not unworthy of attention, if tempered with a little common-sense and self-restraint, to prevent us losing sight entirely of the commercial aspect of the question.

It is well within the experience of most professional photographers that their clients do take an annoying amount of interest in the accessories and backgrounds. Customers will come into the reception-room, take up one of the specimens, and ask to be photographed with the same background, frequently to the proprietor's despair, for he knows that it will not suit them; but it is a bold man who says so! And as an extreme instance of misplaced attention to the unimportant we may mention a case we lately heard of, where a regular patron of a certain studio refused the proofs resulting from her latest sitting, not that they did her injustice, or were in any way bad portraits, but because she did not think the background was such a pretty one as usual! But it is probably only one sitter in a hundred who would be so fantastically absurd; and if we shape our ways and methods to please such, we shall doubtless only do so at the expense of displeasing the other ninety-nine. The day of mere photographs is nearly past, and people begin to expect that the product of the camera shall also be a work of art, and not altogether disobedient to the unchanging and immutable laws of art.

To return to the matter of backgrounds, it is astonishing how much may be learnt concerning their fit and proper use by a morning's walk round the rooms of such a collection of paintings as the National Portrait Gallery possesses in St. Martin's-lane. One of the first lessons, perhaps, that will be impressed upon us by a study of the pictures to be seen there would doubtless be the almost universal suitability of a dark, plain background, and its wonderful value in giving emphasis to the features and figure of the sitter. It would seem to be an especial favourite with portrait painters, and, to judge by appearances, is also much inclined to by many of our leading photographers. A dark curtain, hanging in heavy folds, with a small surface of a fluted column rendered visible where it is thrown back, is also a popular and effective way in which the painter deals with the background difficulty—an idea capable of many variations for photographic purposes. It would appear to be but seldom that the artist cares to introduce any amount of elaboration or ornament into the background. In nearly every case severe restraint and simplicity are evident in this direction. There are, certainly, never to be seen anything remotely resembling the abundance of distracting detail that we see in so many photographic canvasses—imposing staircases of stone with winding balustrades, many-coloured fountains, ormolu interiors with handsome chandeliers, and other like abominations.

It will, no doubt, be noticed, however, that accessories and pieces of furniture are often turned to excellent use, even where the background itself is absolutely plain and unassuming. The articles of furniture to be seen in these paintings have, it is scarcely necessary to say, little in common with those fearful and wonderful things designed only for photographic use which we sometimes come across. We venture to think a thoughtful contemplation of the pictures in this collection, and similar ones, would considerably enlarge the horizon of the average photographer, giving him invaluable and undreamed-of hints as to the choice and arrangement of suitable accessories to his pictures. He will there see many instances where arrangements wonderfully commonplace and simple are yet employed in a striking and dignified manner, and with the maximum of effect. The accessories chosen by the painter are, generally, those which have some connection with, or deal with, some sentiment proper to the sitter; the judge is represented with his law tomes and parchment rolls, the author with his manuscript, the painter, perhaps, with brush and palette. But as, of course, all a photographer's clients are not taken from these illustrious professions, the examples here given are necessarily of rather limited application. They will simply serve as a hint that the surroundings in a photograph may, with the greatest advantage, be brought as much into harmony with the characteristics of the sitter as possible. Photographic backgrounds not infrequently display the results of a curious error, the chiaroscuro being so managed that the light appears to come from the background itself, a state of affairs which, in nearly every case, renders the lighting of the sitter palpably out of harmony with the rest of the picture. Too much attention can hardly be paid to the avoidance of mistakes of this nature. We have known of portraits lighted from one direction taken against a background in which the source of light appears entirely contrary. It may be suggested, too, that our canvasses, as a rule, have far too much light about them. They need not be too dark and sombre, but certainly might with advantage be much darker than they very often are. It goes without saying that the artist of the camera has a much more restricted choice in the matter of backgrounds than his brother of the easel and brush. He cannot produce, at a moment's notice, something fresh for every sitter that comes. However large his stock of canvasses may be, it must often happen that, for a certain client, he has not got one that is quite what he would like. A

man of ingenuity and taste is, however, seldom much put out, his inventiveness generally proving equal to the occasion. In conclusion, may we be excused if we once more dwell on the sufficiently obvious fact that the background is for the sitter —not the sitter for the background; that however essential and worthy of study the latter may be, it is simply to be regarded as a part, and by no means the most important, in what should be a harmonious and tasteful whole.

ELEMENTS IN BUSINESS SUCCESS.

The photographer in business grumbles that his trade is overdone, and that profits have been reduced by unfair and excessive competition to a very low level. Members of every other trade and profession say much the same about the ones they are in—barring possibly the undertaker, and in his case the reasons for his forming the exception are of so peculiar a cast, that owing to them the trade will probably ever remain more of a close, and so a profitable, one than any other. It must be granted that competition all round is keen, and that profits and prices would be more agreeable if they were higher. But what is the use of grumbling? No amount of grumbling will turn the moving hand on the commercial dial back to any point beloved by the praiser of times that have been Besides, the condition of mind begotten of grumbling is apt to cripple the work that must be done whatever the conditions may be. On the other hand, it is fortunately as true that a cheery determination to make the best of things as they are will react for good. Under its healthier stimulus many points will be noted where improvements can be made that will better the position. The photographic field forms no exception to the action of the rule, that success is always directly proportionate to the quality and extent of effort put in to gain it. The man who can better an existing order of things stands to gain. This is clear enough when noted in large things. It is equally true, if not always equally clear, in smaller matters, and success upon the whole is due more to a persistent looking after the many small things of life than after an occasional great one. More successes could be counted amongst men who have made a point of keeping their shop windows clean and attractive, than amongst those who have aimed at the evolution of a new process.

Does the professional photographer make the best use of existing conditions? Could he not, whether disposed to grumble or not, improve his position and his returns by attention to some of the small things referred to? We think he could. The great thing is, of course, to attract the customer. Start at the common-sense bottom of the question, by taking an ordinary individual walking past a photographer's window, without any idea in his mind of having his own photograph taken. What is most likely to induce him to stop, look in, and start upon a mental path of favourable determining? Will the orthodox window do so? The extent of grumbling prevailing seems to point to a "no" as an answer. The fact is that much more could be made of the window at little, or no, extra expense. As it is, there are too many prints in it. Attention and interest are frittered away instead of being concentrated. The arrangement of the prints, too, upon sloping stands of coloured velvet or plush, the darker or lighter effects of protection from, and exposure to, the sun, determined by the different positions of a former batch, showing here and there, is poor and ineffective. The whole window looks dry and spotty. It may be perfectly clean and free from dust, but it lacks coolness and freshness. It cannot be called inviting. Very good work is often displayed in such a window to the detraction of a half of its just merit. A carefully selected quarter of the usual number of pictures; an enlargement or two suitably placed; light, cheap, soft drapery of a pleasing tint, that would admit of frequent renewal, instead of the permanent, heavy, and dull-looking velvets and plushes, would make a great difference in general attractiveness. A few ferns would still further add to it. The coolness of living green is extremely welcome in the photographers' season of summer, and makes capital dressing for the bait. It requires something of artistic taste to arrange in this fashion. But the photographer is more likely, from the nature of his work, to possess it than many another, and the reason that he has not already tried it is probably more from not having thought of it than any lack of capacity. His wife would be of great assistance to him in such a field, for without going so far as to say that women have keener artistic instincts than men, it must be admitted that they are far more deft in arranging the constituents of a happy artistic combination. We are assuming, of course, a good grade of work, for whilst much first-rate work fails to take from being poorly displayed, no setting, however good and artistically arranged, will pass off bad work. Still, there is a happy knack in selecting specimens of good work. Beyond beauty of face or form, so hard to get hold of, style and character of dress tells. This, perhaps, is a question more for the wife or lady friend; but if there be specimens close enough to each other in artistic merit to cause hesitation in deciding which is the better, let the one with the more fashionable dress be chosen. It will be far more likely to favourably take the eye of a lady customer, and unconsciously make her regard the photographer as up to date. Frequent changes should be made, and care taken to think of appropriateness to season, in showing light, airy dresses in summer, and warm, comfortable-looking ones in winter. If otherwise, a certain on-edgedness is produced in the mind of the one looking at them that is not the most conducive to the feelings leading up to ultimate business.

Prices should be also marked upon a good card, that will not fade in the sun. Now, as to prices, it is most pleasant, undoubtedly, to quote and sell by the dozen. The half and quarter come next in order. But would it not be wise to quote for the single copy as well? The photographer must not forget that prices are cut in other trades than his own, and that those engaged in them find that the expenditure upon a luxury to the amount charged for even a quarter of a dozen must very often be thought over and arranged for. They might manage one, say at a shilling, at once, and it is best to catch when the impression is most favourable. The shilling copy would also act as capital bait in the case of ampler means. There is due proportion of profit in it to the photographer, and if he is alive to the value of advertising, it is far superior to any alternative method in vogue. It offers a chance to the enlargement firms as well, we admit; but that phase of advertising will soon pass away. The exhaustion of the novelty, that is essential to the success of such an advertisement to them, is the photographer's best hope. The same considerations apply to the reception room as to the window. A few photographs well arranged, light airy curtains, a large case of green plants, showing that they have been recently watered, thrown into the room by lifting the bottom sash of the window, would have a very different effect upon the customer to the existing arrangement of the majority of such rooms.

Much has been written about the studio from the photographer's point of view. It might be just as well to consider it from that of the one who has entered it to be photographed. It may be perfect as to position, size, incidence and arrangement of light, and yet be anything but attractive to a visitor. The two great drawbacks, as a rule, are heat and litter. The former is hard to get over in a glass house; but it can be greatly reduced. The coolness of green paint over the glass and walls is out of the question; but there is no reason why here again the fresh green of ferns and indiarubber plants should not be introduced. (The possible smart critic may make a point by stating that it is a photographer's business he is trying to run, and not a florist's. But we hold to our point, a good picture is all the better for a wide setting of margin.) Larger sections of side and roof should also be made to open. Although in a town studio there will be the drawback of "soots" and dust to contend with, muslin stretched over light bamboo frames would do much to counteract it. Top ventilating currents above the customer's head are very practicable with the exercise of a little ingenuity, and the use of a cheap ventilator or two. The litter of dusty backgrounds, the toys that are supposed to make children look natural, an odd camera stand, the rustic stile, and elaborate balustrade, ought to be kept carefully out of sight. They are bad enough as accessories to the picture, but doubly so as studio

furniture. We ask the unbiassed reader if the customer in front o the camera in a studio bearing evidence of being carefully looked after, with no litter, and curtains lightly swaying in cool air, is not far more likely to induce the happier expression desired for impression upon the plate, than under the reverse conditions generally obtaining? It should go without saying that the freshness in all the appointments of window, reception room, and studio, should extend to the operator himself. We do not say, pray note, personal cleanliness. That may be, and we presume it to be, of the first order. But there is an alert freshness of dress and manner that is quite independent of this. Ninety-nine customers out of a hundred would far rather see the operator in comfort in a light summer jacket, or even in shirt sleeves, than in the orthodox tail coat, &c. Why—but this article is long enough already. It is intentionally more suggestive in style than more fully elaborated. There are a hundred different ways, and all perfectly legitimate, of catching customers. Let the professional, with more time on his hands than he would wish, think them out for himself, now that the idea has been placed before him. The dull winter season is coming on, when in the natural order of things he will have plenty of time to think. We trust that he will do so to such good purpose that next spring and summer will mean a material increase in his returns. He can be very certain that the more he throws of original thinking and novelty into his business, the more money he will take out of it.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION: FORMATION OF THE HULL AND DISTRICT BRANCH.

A MEETING to consider the advisability of forming in Hull a local centre of the Professional Photographers' Association was held at the Grosvenor Hotel on Wednesday, September 11th. Invitations had been sent to the twenty photographers who have establishments in the city, and of these the following gentlemen attended: Messrs. D. Abba, W. Barry, C. Delf, W. H. Duncan, W. Fussey, W. Hancock, C. Jones, J. Osbourne, E. E. Phillips, J. Gladstone, T. Roddinson, T. C. Turner, R. T. Watson, W. J. Wellsted, T. Parrish, and C. Berry. Letters of apology for non-attendance from two others were also sent to the Hon. Secretary. With this practically unanimous professional support the meeting proceeded to elect its officers for a year: President, W. Barry. Vice-President, W. J. Wellsted. Treasurer, R. T. Watson. Hon. Secretary, T. C. Turner. A proposal that the meetings should be held monthly and that the incidental expenses should be borne by a local subscription was carried, nemine contradicente. Eleven new members were elected.

Mr. T. C. Turner, on behalf of the Local Branch Organization Sub-Committee, congratulated the meeting upon this first and successful gathering. It was the best kind of answer to the croakings of faint hearts, and the absurd prophecies of collapse which a few men outside professional ranks saw fit to indulge in. For the first time in the photographic history of Hull, nearly the whole of its professional workers were gathered together in friendly consultation, and the possible good that might result to themselves was incalculable. The Association did not aim at lessening a healthy business emulation and rivalry which must and should always exist among its members, but there were certain growing difficulties which could not be regarded as individual, but which affected the whole profession, and the only way to remove them was by united consultation and collective action. Hull held this view and was doing its own modest share in organizing, and if one day the machinery of the Association had to be employed in defence of professional interests gravely at stake, Hull photographers would recollect their first meeting with pride and satisfaction.

The President (Mr. W. Barry) believed the Association was launched on a successful course, and they must not forget that the bright prospects of its future were, in a large measure, due to the zeal and untiring energy which Mr. Thomas Bedding, the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, gave to the movement. He was, in fact, "a tower of strength." The mere fact of the Association being in existence constituted in itself a valuable insurance, and it should be borne in mind that a great deal of the apparent weakness of photographers arose more from isolation than from apathy. The Association would doubtless do much to bring all photographers at a distance into a closer acquaintanceship with matters affecting the best business interests of the profession. Mr. Barry gave instances in which a greater uniformity of professional practice would result in the suppression of those attempts at the imposition of unfair conditions, which are sometimes made by trade firms requiring photographic services.

The meeting was also addressed by Messrs. Wellsted, Osbourne, Fussey, and others, and was then thrown open for discussion on a letter which recently appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, signed by an important firm of dealers, and touching the subject of direct trading between professionals and manufacturers. The view was generally taken that the time was at hand for the removal of those anomalous conditions of trading at present existing. It was held to be a difficult and embarrassing matter all round. No doubt there were dealers *and* dealers. The old-established firms of importance and eminence in London and the greater provincial towns had earned in the past a reputation as good business friends of the professional, and one photographer present candidly admitted that the "genuine" dealer was always of distinct "financial" importance to his welfare. But on the other hand, a number of new comers trained as shop chemists, stationers, clerks, &c., had become "dealers," receiving full manufacturers' discounts, and at the same time competing, in many cases openly, with the professional worker, whenever the expense of a regular establishment could be conveniently dispensed with. In this way professionals' photographs were copied and enlarged at miserable prices and in miserable fashion, and outdoor work done at impossible competitive rates. This state of affairs was described as unfair, and on the face of it the remedy seemed to be in the recognition of every professional as fully entitled to dealers' terms —or that manufacturers should refuse to allow trade terms to dealers in any way competing with the professional in business.

The further discussion of this matter was postponed to the next monthly meeting of the Association, and in the interval it was decided to address the professionals in Grimsby, Bridlington, Goole, and other neighbouring towns, inviting them to join the Hull centre.

BEING PLEASANT.

[An Address delivered to the twenty-first Annual Convention of the Photographers' Association of America, held at Detroit, August, 1901.]

"THIS subject of 'being pleasant' is a curious one. Everybody is pleasant sometimes; but we want to learn to be pleasant at al times. I want to first talk to you of the advantages of that, and then next how to do it, as far as I have learned it. I have not learned it all yet; but I am getting along. I have been learning it for some time; and one reason why I enjoy life more than I used to is that I am learning more and more how to 'be pleasant.' It is quite a trick, how to do this; and it touches every customer you come in contact with; it touches everything about us. Everybody who has anything to do with us feels this atmosphere at once, from the little newsboy to the members of our families at home; everybody feels the effect of that one thing, and it is the most essential thing to get into our work.

"We are told by Shakespeare that our thinking makes things either good or bad, there is nothing, either good or bad, but thinking makes it so. Another wise man, who lived hundreds of years before Shakespeare, said, 'As a man thinks, so is he.' 'So is he,' in his heart! We have learned much when we learn that nothing outside of ourselves has anything to do with our being pleasant—not a thing! No matter to me how you look, no matter to me how you think, or how you feel, I must be pleasant. We have a little world of our own; we all have our ancestral ideas on our shoulders; we all think we have to be cross, and get old, and get wrinkles on our faces, and look crabbed and surly, in order to be dignified. There is nothing in that; nothing whatever. If we want to enjoy our lives, we must find out how to be always bright and pleasant.

"And I would add to those things that good men told us of, 'As

I think in my heart, as my heart is, that is the way I am.' That is my idea, and on that principle I work. When I look at you I do not measure your surroundings, I just measure you, and how you take your surroundings. We all make that which pertains to us. There is nothing affects us in this world but what we allow it to, not a thing. I make myself; I make my day; and when I want to keep right and be pleasant all to-day, I must begin not to-day, but yesterday, and the morning even before that. I wanted to feel pleasant and lively this morning; but I did not wait until this morning to make that resolve, I began yesterday morning; and to be pleasant to-morrow I will begin to-day; and I tried that—and here I am. I am living just that way every day, and I am getting along splendidly at it. I am telling you this for your encouragement, that you may believe that it can be done. I never get mad, never get worried; I don't care how things go. It took me a long while to get where I could say that. Now, that has an influence on my children; it has an influence on my wife. I will tell you, when you get your wife to say you are 'all right,' it will be a great step forward. It took me longer than anything else to learn to get to the place where my wife could say I was 'all right.' It took me a long time to get there. Every one of the people that come into my business place, or nearly every one of them, is carrying a tremendous load, and they need to meet some one who is not carrying such a load, or can do it more easily. I cannot help another man to carry a burden if I am overweighted myself. No beggar helps another with his pack; it is not the grumblers that help other people in their troubles. The selfishness of men is at the bottom of the whole matter. And I want to say to you that I am a friend to each one of you; but you do not all know it. A man who just met me up-stairs, said, 'Hollinger, you look better;' 'No,' I said, 'you are feeling better.' You are all feeling better, and you look at me, and as you feel I am. Now, I am all right all the time. I am watching all that there is good in you, and I am paying no attention to the unpleasant side. I used to be a great reformer, belonged to three churches, and all the political parties that wanted to reform the State. I tried to down the devil, and generally to reform the world. I have stopped all that now, and am tryng to live as one man. I am not living in New York only as a photographer. I am living there to be a man. That is my highest object—nothing else. Another thing, I am getting a living, of course, primarily from photography; but I want to do it in the easiest possible way; I am working always along the long of least resistance, which is Nature's way, you know. I am paying less attention to things that are wrong, and looking at the bright side all the time, and taking things as they are. Take things as they come, and you will have pictures that will please all the people.

"Another thing I am going to say to you. I am going to show you where I can turn this being pleasant to account. I have a friend sitting down there who worked with me when he was a boy. We used to turn over to him the taking of pictures of the babies, &c.; and he used to get in front of them and try to entertain them; and we would hear him say, 'Look at the monkey, look at the monkey.' Why, even the baby's mother had to laugh. There was no monkey; only she laughed at the 'monkey.' That's all. Everybody saw the 'monkey.' So, look at the monkey! I think of him often, and I always think, 'Look at the monkey!' That taught me a lesson. We never told the mother to 'look pleasant!' She thought of the monkey.

"That suggests a few points. We do not need to tell people any more to 'look pleasant.' We must be the thing, and we will bring it out of the people. Our pictures must reflect the right atmosphere, or I do not care how fine otherwise they are. They will not have the soul in them that will give them life. The pictures that you will see in some great gallery may not some of them be technically correct in every line, but now and again as you look at one you will find a soul speaking out of it. The man was behind the artist, and it is the man who speaks to you. That is what we have to get from our subjects, the soul that is behind the man; you must draw that out; get that into the picture and I do not care what the rest of it is. Now, what we get out of people depends a great deal upon what we put into them. When they come into the presence of a pleasant fellow, they will feel they are pleasant too, and they will at once think better of themselves. We need to know a little of everything to be able to put ourselves in touch with the people we come in contact with. We must hold ourselves free to enter into the thoughts and the lives of the people we meet, so that we can draw them out. Make them enjoy being in the room with you, and they will go away feeling better. Make a pleasing impression upon every man or woman that comes into your studio.

"Now, that is an advantage to you in many ways; but especially in the daily conduct of your business. Let me give you a little incident which illustrates this. When we went to our meal the other day, we were in a fearful hurry because we were late. I was so hurried that it took me a long time to get my tie fixed, and the little details of my toilet. Finally we got into the dining room. It was full, and we could not get a waiter right away; but the head waiter brought us an old fellow, who moved around apparently in a very methodical and lifeless sort of a way; seemingly moping about. We were in a terrible hurry, as I said, and at once my heart went down, but I thought, well, we will make the best of it and wait, so we waited. The old fellow took our orders, and came in again with a smile, placing everything in its proper place, without fuss, without hurry. He arranged all the necessaries of the table. He put the salt, the pepper, the coffee, everything in its place. Then he said, 'Am I all right as far as I've gone?' I saw at once we had struck the right man. If he was asked for anything he didn't fly around after it; he simply got it. Well, we kept on at that table, and I found that that old man knew every time that I was in the room. He knew many of my ways. He knew that I didn't eat a great deal. He anticipated my wants; I tell you before I left I tipped him a little more than I customarily do, and I was glad they gave me the old man. I was glad I had found out what there was in that old man, with his pleasant smile. I tried to express something of this to him, and he seemed to appreciate it, and when he came again to our table he said: 'I see you are around at my table again,' and he was just as pleasant and as nice in his quiet way as ever. Now, if I had kept my ruffled side out I would never have enjoyed that old man, nor would he have enjoyed coming to me the next morning and telling me that he was glad to see me at the same table again. See? Now the point I wish to impress by that is, always to keep the best side out, no matter how things go.

"Now, here's the way to do it. Here's my recipe for making everything 'all right.' Do you hear that word? 'All right.' I tell you that is a tremendous word, which I feel right to the sole of my feet. You can wake me up in my sleep, and if a burglar would come in I would say, 'All right!' Ask my wife if I wouldn't. All right. Nothing ever comes across me that is not all right. If anybody bids me good-bye I say 'All right.' They tell a joke on me that one day there was a young girl going away from our town on a bicycle for Columbus. We went down to see her start. She said to me: 'Good-bye, Mr. Hollinger; I don't think I will ever get back to Dayton and see you any more.' I said, 'All right—all right!' And it was all right! Everything is all right. If I am all right, everything else will be all right. Now, that is the thing. This does not come by saying it once, but it comes by knowing that all things work together for our good when we want them to, and when we are right and enjoy the good there is in everything. Everything—every person—has good in them. There is not a bad person in this crowd. None of you any worse than I am, none of you any better. I don't like any one to say he is any better than I, nor am I worse than anybody else. Every human being is good in a way. It is your and my business when that person comes into our presence to get that good out of them. When I meet any one and I keep the sweet part out, it will draw the sweet out of them. Everywhere I go I am getting the beautiful, the lovely, the sweet side of life; and I think that almost all my pictures show that, and if they do not I do not show them to anybody, unless they show forth the best there is in the subject. I don't care how cross somebody is, I know the only way I can counteract that is by not feeling cross myself. If things don't go right, that's all right.

"I want to say one more word and then I will quit. You will never get the best out of people until you are willing to trust them.

I went to the great City of New York prepared to trust every one that came into my place. I used to tell people when they came up to the desk: 'You will have to pay; I don't trust anybody, I treat everybody alike.' And the next time we met, that man and I didn't feel quite so kindly to each other. I learned after awhile that I could trust everybody, and things moved along very much better, and I got very much more money out of them. Some of you probably say, 'You cannot do that in New York.' I think I can; for you know that every person that thinks you have a good opinion of them in your town likes to pass you on the street, and everybody that thinks you have a bad opinion of them doesn't want much to do with you anywhere. There is not a man or woman or a child that is going to cheat you if they can help it, if they think that you think they are all right. You know that. You may not get your pay as quick as you want it, but you will get it. Trust people everywhere, and you will get your pay. Many a mother has lost her child and has no picture of it, because she thought she had to pay in advance, or she couldn't get a picture taken. You might have taken a beautiful picture of that child if you had been willing to trust that mother. Let us do as we like to have others do to us. I do always the things that I would like to have people do to me. I bought some supplies in Cincinnati from a concern that never saw me before. I selected what I wanted and said, 'I think I will take this piece with me.' They said, 'All right.' And they sent the balance to New York, and they never said pay, or never said bill. They were the first people I paid after I got back home. I felt I was all right. I have tried to treat every person I have come in contact with the same way. Don't talk much to me about photography. We all know about that, but we want to know how to live. I have kept this room full, and not a man has left his seat, yet I didn't ask any one of you to stay. You did it. Why? Because you saw, as my friend used to say, 'The monkey.'"

W. M. Hollinger.

HOW TO MAKE £1500 A YEAR WITH A NEW P.O.P.: A COMEDY IN AN ADVERTISEMENT AND THREE LETTERS.

1.—The Advertisement.

ADVERTISER, thoroughly practical, and having enormous connection, would like to meet with a Gentlemanly Partner, with £250, to assist in working up one of the best and most profitable businesses known; large income certain; proofs and references given, and investigation courted; high-class and free from risk.—E. C. M., 1257.

Letter I.

"Your favour to hand in reply to my advertisement (E. C. M.) in the 'Telegraph' on Wednesday. I have for many years had a thorough practical knowledge of the preparation of photographic papers, having done business with the leading firms in the world. Some ten years back a new paper was introduced, which has since become the standard paper for photography—this is 'gelatino-chloride printing out paper,' known in the photographic world as P.O.P.—and used by every professional and amateur photographer in the world. There are perhaps nearly a dozen makers of P.O.P.—the two largest of them being the Kodak Company and the Ilford Company—both of whom do an enormous business. With my practical knowledge, and knowing the enormous profits made on this paper, although now engaged in another profession, I have during spare time been experimenting with the hope of making an article equal to the best, and I have been so fortunate as to go beyond this. The first expert we have says my paper is 'fully 50 per cent. better than any other,' and another firm, having thoroughly tested it side by side with the best brand in the market, has sent me photos on the two makes, with a letter giving their opinion. These you can see at an interview. I am willing to give up other things to go into this, provided I can meet with a partner suitable in every way; one who would take an active part, and who would be thoroughly initiated, that he might share with myself the management. At the same time it would not be worth my while to embark in a partnership unless we went in for doing so on a fairly good scale; nothing under £10 per week would pay me, so that to give us each an equal share it would be necessary to make £20 per week profit, and be able to look forward to doing much more. I think if favoured with a personal interview I can soon satisfy you that there is an absolute certainty of doing this, and much more. In England alone there are over thirty thousand professional, and quite a million amateur, photographers, and that (as I will show you) the smallest professional uses one quire of paper weekly—some five to ten quires)—so that even 100 customers of this class would give a profit of £30 a week, as by my process (which is very simple and inexpensive) I can make each quire for less than 6s., and the usual selling price is 15s. (less 10 per cent. to professionals). I propose selling at a lower price, so as to do business almost entirely for cash with order, and I can almost immediately command a large sale. I am quite willing to provide all the necessary apparatus for turning out the paper, so that the capital you introduce may be used solely for the business. The expenditure would be trifling, as at first we should only require two rooms (anywhere), and one worker could turn out a large quantity. I understand one firm (a limited company), making P.O.P., returned their profits last year at £40,000, and another at £20,000, so that my [illegible]er being better, I am only reasonable in saying we can make £1000 a year easily. The first thing to be done is for you to write me, naming your own time to call here, and I will be at home, and go fully into everything, when, if mutually satisfied, an early start could be made. I am getting on in years myself, and therefore would prefer a partner who would be willing, after a time, to take almost the sole management, and receive an increased consideration for doing so. The connection would principally be worked up by sending circulars and small samples through the post to professional photographers, amateur societies, etc. Everything, of course, depends upon the quality of the paper. At an interview I will show you splendid photos on it, and, beyond showing you the high opinions I have, I would suggest that you get independent proofs, for which purpose I will make up some paper for you to get tried. I have been twenty years at the above address, am well connected, and will give and expect the highest references. Any quantity of shipping as well as wholesale business can be done, the latter principally with chemists, who buy to sell to amateurs. Practically there is an unlimited demand for a really A1 photo paper such as this is. Please treat this letter as confidential as far as the photo profession is concerned until after an interview."

Letter II.

"According to promise, I now send you two packets of samples—one packet cabinet, the other quarter-plate size. I may say, however, after having interviewed four gentlemen who answered my advertisement, I have decided not to enter into a partnership to work the paper business on a large scale. They were none of them suitable. Of course, not having seen your son, I can't say if we should have come to an agreement or not, but now I have decided on remaining in my own business for at least another year. If, after you have had the samples tried, your son would like to start a business for himself on the lines of my letter to you eighteen months ago, I would be willing to teach him the formula, and how to prepare the paper, for a premium of £25 down, provided he agreed to sell the paper for cash at 10s. 6d. per quire post free, and would pay me a farther £25 at the end of a year should he have sold 50 reams (1000 quires). He could at first either make it his only business, or carry it on in spare time until he saw it was worth devoting all his time to. One good-sized or two small rooms anywhere would be sufficient, and for £15 he could not only fit them up with all the necessary apparatus for properly turning out the paper, but could provide paper, chemicals, circulars, and everything to make a good start. By sending out a few hundred circulars with small samples, the orders would flow in, several I guarantee during the first week. He need have no assistance whatever to make 50 reams a year, and, by selling at the low price of 10s. 6d. per quire, the profit would be 4s. per quire, or £200 profit the first year. If he gets the samples tried he can ask those who try them if the paper will not sell readily, and in any quantity at that price? I could no doubt put him in the way to secure some half-dozen customers who alone would take as much a week to sell 1000 quires the first year. I guarantee that after two or three lessons he shall be able to do everything properly, and I will help him to get off the circulars and samples by post. If you wish to go further on the matter, please name a time to come here and see me, but to prevent any misunderstanding I may say I will deal with no one who is not the principal. I shall be glad to know how the samples are liked. P.S.—Of course, the samples of paper must not be exposed to the daylight."

Letter III.

"Your favour dated the 30th ult. has only reached me this morning. I am not surprised to hear your friend reports highly of the paper, as I am sure any photographer giving it a fair trial would pronounce it far superior to other brands. I regret, however, I cannot fall in with your suggestion, or come to any arrangement whereby I hold any interest in the concern with any one else. Therefore if my last offer does not commend itself to you, I have no alternative than to withdraw from the negotiation. You say it would be necessary for me to be in it to see that the work was properly done, but, as I explained to you, your son could learn everything really in half an hour; but I should give him any time he needed, and at any future time advise him if required about anything connected with the business. It is simply mixing a certain solution which any one could do after once being shown, and then floating the paper on it and drying it off. A girl of 14 could learn and do everything properly in a few hours. My reason for suggesting that the paper should be sold at 10s. 6d. per quire for cash was that your son should very quickly work up a connection to bring in £4 per week profit, as the second payment of £25 would not come to me until he was making that profit, and, of course, I know that by selling at that price orders would flock in; but that would be a matter for arrangement. Surely my offer is a fair one. I only ask £25 down for placing your son in the exact same position as I am in now after spending quite £50 in experiments and two years of my spare time. You, as a thorough business man, must realise that directly he had got only one or two customers he could, if he wished, take in a partner with some hundreds, or sell it for a large sum of money. However, you are the best judge of this. I may say I had given up hearing from you, as I think a fortnight heaps of time to get a few samples tried, seeing they could be tested in an hour. Under the circumstances I am sorry I cannot keep the negotiation open after this week. Therefore unless you accept my offer before Saturday next it is understood the matter has fallen through."

Our Editorial Table.

The Plastigmat Lens.

Agents: A. E. Staley and Co., 35, Aldermanbury, E.C.

The Bausch and Lomb Optical Co., of Rochester, N.Y., have favoured us with the opportunity of testing a specimen of a new anastigmatic lens, of which they are the patentees. The lens is of a rapid type, and works with full aperture at f-6.8. The instrument submitted to us is intended for a whole-plate, and the focus is 11 inches. By reference to the U.S. patent specification we find that the construction may be described as resembling the well-known double anastigmat of Goerz, with the exception that the front crown lens has been replaced by a crossed convex lens cemented to a meniscus of rather lower refraction. Each combination is thus composed of four elements instead of three. The definition of the lens at full aperture is very good, and fully justifies the claims made for it. Each half may be used as a single lens with about twice the focus of the doublet, and upon using the back combination alone we found the definition all that could be desired. The separation of the lenses is greater than in most anastigmats, which leaves more room for the introduction of a diaphragmatic shutter. Whilst this is a very desirable feature, it limits the field of the lens, and we should therefore describe it as of medium angle. The field is very flat, and the correction for astigmatism very good. The workmanship throughout is excellent, and the lens will doubtless find favour with a large number of photographers.

The Zeiss Convertible Anastigmat.

Agents: A. E. Staley and Co., 35, Aldermanbury, E.C.

The Bausch and Lomb Optical Co. have also placed before us a specimen of the Zeiss convertible anastigmat made at their works under license from the firm of Carl Zeiss, of Jena. This lens, which we look upon as one of the best and most useful series invented by Dr. Rudolph, has become a favourite in all parts of the world. The instrument before us is formed of two combinations of different foci, and thus gives the photographer the power to take three pictures of different size from the same point of view. The doublet has a focus of 8½ inches, with an aperture of f-7, and the single combinations are of 16½ inches and 14 inches focus, with aperture of f-12.5. A movable ring is marked with the diaphragm apertures for the three foci. We notice one point of novelty in the mounting. The ring supplied to take the place of the second lens, when one combination only is used, is thin and deep. It may be screwed on the front of either combination, as well as on the mount, and it may therefore be used as a sunshade for the lens, which at times is a very desirable addition. The lens is of high quality and excellently finished throughout.

Catalogue Received.

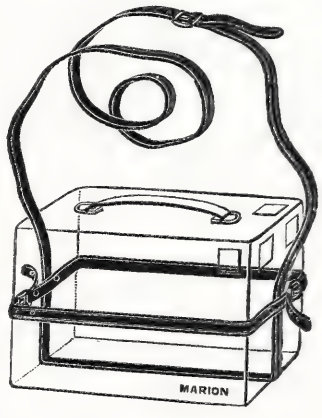
Marion and Co., Ltd., Soho-square, London, W.

Very early in its history as a limited company the old-established house of Marion's has taken occasion to send out a new catalogue, a copy of which lies before us. It is a strongly bound book of 304 pages, six of which go to the making of the index. The catalogue should be found useful by the amateur and professional alike—especially the latter, as a wonderfully complete stock of apparatus and material suitable for commercial photographic use is described and illustrated in its pages.

The Soho Carrying Strap for Hand Cameras.

Sold by Marion and Co., Ltd., Soho-square, London, W.

This strap, which fits any size hand camera, enables the instrument to be slung on the shoulder ready for use. It is cheap at a shilling,



and so convenient that no photographer should be without one. The illustration shows the method of using it.

The "Teb" Christmas Cards.

In sending us a sample box of the "Teb" Photo Christmas cards, Messrs. Charles Tyler and England Bros., of 79, Copenhagen-street, Caledonian-road, N., remark:—"Already we have received inquiries and orders from almost every country in the world in respect to the competition which is being held in connection with these mounts, which seems to foretell that it will be very popular, not only with the amateur, but with the professional photographer." The specimen cards sent us are tastefully designed and coloured; and the appreciative reception they have secured at the hands of those to whom we have shown them is, to us, a sure indication that they will be very popular.

Pictorial Landscape Photography. By John A. Hodges, F.R.P.S. 111 pp., 35 illustrations. Price 1 dollar.

Published by the "Photo Beacon" Company, Chicago.

The series of chapters by Mr. Hodges on Pictorial Landscape Photography that have been running through the pages of our Chicago contemporary, the "Photo Beacon," are here presented, we are pleased to find, in book form, thus making the author's teachings accessible to the English as well as the American photographic public. Mr. Hodges writes in a simple, unaffected, non-dogmatic style, and his book is just the one to place in the hands of the student who is anxious to make pleasing landscapes which, in conforming to certain easily understood rules, may also claim to possess some pictorial quality. The author's declared aim, in fact, is "to instruct the novice in the various methods which are open to him by which he may modify the natural tendency of the lens to give a too literal or matter-of-fact or commonplace rendering of the subject portrayed." Mr. Hodges favours some amount of "control," but condemns brushwork on the print. We are glad to notice that he gives some attention to the subject of "landscape with figures," a point in which most amateur photographers are weak. We think Mr. Hodges' little book full of suggestive help to the aspirant after renown in pictorial photography. It will have well served its purpose if, though failing to produce for us a crowd of Emersons, it teaches the heedless snap-shotter that pleasing landscape work can only be achieved by some study and application.

Studio Gossip.

The first number of the "British Optical Journal," edited by Mr. Arthur C. Brookes, and published by Messrs. Marshall and Brookes, Harp-alley, Farringdon-street, E.C., has been issued. The specimen before us is well printed and produced, and the contents are of great value to those interested in industrial optics. A series of articles on "Applied Optics," by Dr. Drysdale, is commenced; Topics of the Month; Astronomical Notes; "Our Consulting Room," by Mr. John H. Sutcliffe; Microscopical Notes; and an illustrated interview with Dr. R. M. Walmsley are amongst the other features. The "British Optical Journal," which is to be published monthly, price sixpence, has only to maintain the high standard of the first number to be assured of success.

Who Would Not be a Photographer?—Of cheap cameras there are now no end. They can be had from a shilling, or less, upward. We were recently shown the prospectus of one with view finder, time and instantaneous shutter, and best changing arrangement for the modest sum of three shillings and sixpence. So far there is nothing extraordinary. But the prospectus further states "Success guaranteed with every plate." We should rather suspect that the vendor must have a lively time of it occasionally with the novice who takes up photography for the first time, and is assured of success with every plate. If that can be done with a three-and-sixpenny camera, what must be expected by purchasers of those of the more expensive kind?

At the Yarmouth Police Court, last week, an application was made by a beach photographer, named Conyers, that he might be allowed to collect money. He told the magistrates that he had lost all the stock-in-trade, &c., belonging to him in a recent fire, and he had been persuaded to get up a petition to collect money and restart in his profession. Before doing so, he desired the signature of the magistrates to legalise his act.—The Chairman told him that there was no objection to his making a collection.—Conyers, it will be remembered, was the photographer who took the beach photograph of Mrs. Bennett, who was murdered on Yarmouth Beach in September of last year. He has been a photographer on the beach at Yarmouth for the last thirty-six years.

"The Bromide Monthly."—We have received the first two numbers of this publication, which is sent out by the Rotograph Company, of 101, Fifth-avenue, New York, and shortly to be issued here. The frontispiece to the August number is a portrait of Mr. E. B. Core, the President of this year's American Photographic Convention. Quoting from the prefatory address in "The Bromide Monthly," it will be devoted to the record of progress in bromide photography, but it will not exclude matters of interest in other branches of the art, such as negative-making, etc. It will be unillustrated, save for the frontispiece, which will consist, every month, of a Rotograph bromide print. It will give formulæ for obtaining the best effects on bromides and for toning them. It will treat of enlargements and of contact prints.

"The Playgoer."—Edited by Mr. Fred. Dangerfield, and published by Messrs. Dawbarn and Ward, Ltd., of Farringdon-avenue, E.C., "The Playgoer," an illustrated monthly magazine of the stage and all entertainments, is announced to appear. According to the prospectus, the new comer will be royal octavo ($9\frac{1}{2} \times 6\frac{1}{2}$) in size, and will consist of not less than 64 pages of matter and illustrations. It will be printed in good style on fine super-calendered paper. The illustrations will, in nearly all cases, be reproduced from photographs, and will be printed from the finest half-tone blocks obtainable, made by Carl Hentschel, Ltd. It will be the editor's first thought to make the letterpress light, bright, and entertaining. The price is sixpence net. The first number of "The Playgoer" will be published on October 15. Conducted on the lines laid down in the prospectus, there is a splendid field open to the new monthly, which has our heartiest wishes for a successful career.

The Oldest Professional Photographer in America.—Our contemporary, the "Photo Era," states that Mr. Josiah Johnson Hawes, the oldest professional photographer in the world, died at Crawford, N.H., on Wednesday, August 7, whither he had gone for rest. Though in the 94th year of his age, he did his own operating and posing until the last. His venerable figure and quaint studio in Tremont-row, Boston, has been a striking landmark in the city for over sixty years. He was a painter of portraits in oils in his early days. In 1841, only two years after Daguerre had communicated his discovery to the Academy of Science in Paris, and in the same year that Fox Talbot first gave the Royal Society in London a description of his process for securing a negative, Mr. Hawes was making Daguerreotypes in Boston. Two years later Dr. Draper, of New York, succeeded in reducing the time of exposure necessary from thirty minutes to twenty-five seconds. The process being now feasible, Mr. Hawes associated with him a partner, Albert Southworth, and together they built the first skylight for sun pictures in America, and soon the studio of Hawes and Southworth, Daguerreotypists, was known all over the East for fine portrait work. Among those who sat before Mr. Hawes' camera were Daniel Webster, Charles Sumner, Rufus Choate, Louis Kossuth, Theodore Parker, Emerson, Channing, Jared Sparks, Bronson Alcott, Lyman Beecher, Thomas Starr King, Dorothea Dix, Lucy Larcom, Oliver Wendell Holmes, Longfellow, and many more whose fame still lives. Jenny Lind and her lover, Otto Goldschmidt, were taken while seated hand in hand. Charles Dickens was a frequent visitor when he came to Boston, and with James T. Fields as his companion, he often used to climb the winding stairs to the studio or "salon," as it was called in these early days. In those days sitting for one's picture was, with most people, a serious business, not to be entered into lightly. There was no duplicating a Daguerreotype except by a second sitting. There was no ordering a dozen or two, to be reproduced from one negative. The favourite size, which, though larger, corresponded to the cabinets of to-day, cost $15 apiece. They were made on copper plates, faced with silver and polished like a mirror, and were enclosed in a case or frame under glass. In late years Mr. Hawes revived the art of Daguerreotyping with marked success. He had little sympathy with the modern notion of retouching negatives and with modern photo papers, but stuck to albuma, and Daguerre's process found an unusually fine student in him.

News and Notes.

"A Few Remarks about the Papers of the 'Axe' Brand" is the title of a little pamphlet issued by Messrs. Fuerst Bros., 17, Philpot-lane, E.C.

The Photographic Club.—On Wednesday, October 2, at Anderton's Hotel, opening of the winter session by Mr. H. Snowden Ward on "Photography for the Press."

"Victor Prevost, Photographer, Artist, Chemist," is the title of an illustrated lecture, delivered before the Photographers' Association of America (21st annual Convention), at Detroit in August, by Mr. W. I. Scandlin, Editor of "Anthony's Bulletin," a copy of which has been kindly sent us by the author. According to Mr. Scandlin, Prevost was a well-known New York photographer, who in the fifties introduced the waxed paper process to the United States.

Society Demonstration.—Mr. Walter D. Welford, F.R.P.S., will lecture and demonstrate upon "Pictorial and Decorative Work on Edwards' Films and Warwick Plates." The demonstration will be illustrated by numerous examples and by lantern slides (when a lantern is available), and he will demonstrate Mr. Austin Edwards' new system of developing lantern slides. He will also show the firm's fine collection of prize slides. Societies desirous of fixing dates should write direct to Mr. Welford at Warwick Lodge, 166, Romford-road, London, E., and not to the firms he represents.

Exhibition at Nottingham.—We are asked to announce that the Committee of the Nottingham Mechanics' Institute Camera Club have arranged to hold an exhibition on February 13, 14, and 15, 1902. A loan collection from well-known workers will be a prominent feature, in addition to which there will be an open competitive class, and one for members only, for both prints and lantern slides. The prospectus and entry forms will be ready about the end of October, and may be obtained from the Secretary, Mr. W. Ward, 14, Stratford-terrace, Shakespeare-street, Nottingham.

A method of procuring oxygen has been patented in this country by M. G. F. Jaubert, of Paris (11,466, 1901). A substance is prepared by mixing chloride of lime with sodium dioxide, or other alkaline peroxide. Compressed pellets, which can be used for obtaining a supply of oxygen in the same way that calcium carbide is used for making acetylene—namely, by immersion in water—are prepared in the following manner: 200 kilogrammes of chloride of lime, which titrates 35.5 per cent. of active chlorine, well dried (for example, by standing over concentrated sulphuric acid), is mixed with 78 kilogrammes of sodium dioxide in powder, and the yellowish-white powder thus obtained is made into cakes by strong pressure. The compressed material thus obtained is, it is stated, as hard and shiny as crockery, and when placed in water decomposes with regularity, oxygen gas being evolved.

The Study of a Glacier.—From a note in the "Photographisches Wochenblatt" we gather that a very interesting application of photography has been made, at the instigation of the Vienna Photographical Society, by a photogrammetric survey of the Karlseisfeld. The work was taken in hand by Baron von Hübl, and carried through with characteristic completeness. The results are published in the transactions of the Vienna Imperial Geographical Society. Friedrich Simony made a special study of the Karlseisfeld over a period extending from 1840 to 1890. Baron von Hübl's work was begun in 1899, under very unfavourable conditions, and completed in 1900. In the course of a few years, by repeating the work, it will be possible to trace the changes which have occurred in the glacier, and, as all important points have been determined in the photographs, some very interesting facts may be disclosed.

The Committee of the Hexham Centre of Technical Education has arranged a course of twelve lectures upon elementary photography, to be delivered by Mr. John Gibson, F.C.S., to commence on Wednesday, October 2, at 7.30 p.m., in the Sele Schools, Hexham. The following is the abridged syllabus:—Photography and its practical use in science, art, medicine, surgery, law, literature, agriculture, and commerce generally; silver and other salts affected by light; the spectrum; lenses, and their use and mis-use; the camera and its construction, and the principles and practices necessary in its use; plates, films, and de-

velopers; negatives, good and bad; causes of failure, and suggestions for improvement of imperfect negatives; lantern-slide making, and the use of the lantern in photography; printing and toning and printing out papers; bromide, platinotype, carbon, and other printing and developing processes; art in photography.

We have more than once commented on our contemporary's, the "Tailor and Cutter," criticisms of the garments as painted by artists who exhibit at the Royal Academy each year. Now it seems that art—that is sartorial art—criticism is not entirely confined to this country, for we read that "Prince Bismarck's tailor is indignant with Professor Begas's monument of the late Prince Bismarck, on account of the way he has made the overalls sit on the Chancellor's legs." "I served the Iron Chancellor for years," said he, "and know his fit thoroughly; but neither his tunic nor his overalls ever sat like that! Why, the latter are full of folds, and Prince Bismarck's were always smooth; and look at the tunic! Just fancy a tunic closing like this one round a man's neck!" Oh! Professor Begas, why did you not take the Prince's tailor into your confidence, and get him to model the overalls and tunic for you.

Formation of a Photographic Society at Blackburn.—A photographic society has recently been started in Blackburn, and at a meeting held on Thursday, September 12, a list of rules, which had been carefully considered by a provisional committee, were submitted and approved of. The society, which will be called the Blackburn and District Photographic Society, will hold its meetings fortnightly, on the second and fourth Tuesdays in the month, and the first meeting, which will be a public one, takes place on Tuesday, the 24th inst., when a lecture will be given by Mr. E. S. Bellingham, of Blackburn. The objects of the society, as set forth in the rules, are: The promotion of knowledge relating to photography; the discussion of technical details; the demonstration at stated times of the various photographic processes; the development of the artistic perception; and the mutual improvement, enjoyment, and recreation of its members. An excellent start has been made, and over 80 members have already given in their names. Mr. R. Wolstenholme has been appointed the first President, and Mr. Henry Neville and the Rev. J. Farquhar Vice-Presidents. The Secretary is Mr. W. Duxbury, and the Treasurer Mr. Wrigglesworth. Messrs. Wrigley and Hargreaves were appointed Auditors, and the following were elected on the Committee:—Messrs. Howe, Tyrell, Beardsworth, Jones, Lund, Denham, Greenwood, Riding, and R. Ibbotson.

Smokeless Flashlight.—We are indebted for the following note on smokeless flashlight powders to the "Journal" of the Franklin Institute, which derived it from a French source, the "Revue Scientifique":—"M. Charles Henry has endeavoured to keep the magnesia that is formed as much as possible attached to a heavy substance that will not easily fly about and falls soon by its own weight—namely, the binoxide of barium. This substance, at a red heat, gives up half of its oxygen, and its salts communicate to flames a brilliancy of greenish fire, which partially corrects the undue proportion of violet and ultra-violet rays emitted by incandescent magnesia. Finally, the binoxide swells when heated, and becomes capable of retaining the light powder of magnesia formed in contact with it. The sole condition to be observed, that the binoxide may be reduced with incandescence, is to remove it completely from all contact with oxygen. To this end, and also to insure the inflammability of the mixture, the powder is done up in collodion, whose products of combustion constitute a reducing atmosphere, adapted to the dissociation of the binoxide of barium at the lowest possible temperature; all the elements of such a powder thus play an active part at the highest point. These powders have, besides, a great advantage over those made of potassium chlorate; they are absolutely inexplodable by the stroke of a hammer, and are inodorous and without danger from the physiological point of view." M. Henry, we are told, has prepared two types of powder that differ in their proportions of the binoxide; the first, which has only a little magnesium, gives only 45 to 50 per cent. of smoke, whereas ordinary powders give 75 to 90 per cent. The other is richer in magnesium, burns more slowly, and can be used advantageously only in a special lamp, when the proportion of smoke falls as low as 10 per cent., and the brilliancy, owing to the high temperature to which the magnesia is raised, is very great.

Dishonest Photography.—In the course of a lecture on "Climate and the Effects of Climate," delivered before the Royal Meteorological Society, Dr. H. R. Mill remarked:—"Visible effects can be photographed, and therefore these remarks will be illustrated by showing on the screen photographs which I have taken on various holidays in many countries, reinforced by others obtained from friends. But perhaps it would be more correct to say that I hope to give a connected explanation of the series of photographs, the existence of which suggested the subject of this lecture. Before getting to the main subject we must bestow a few prefatory thoughts on the principles of scientific photography, and on some of the wider bearings of climatology. There is probably no department of art more conducive to dishonesty than photography; and some specimens of dishonest photographs now shown should serve as a special warning to amateur photographers. The first warning is conveyed in an illustration published in a missionary magazine 'after a photograph,' although the incident shown in it is one that never could have been photographed at all. Such dishonesty is fortunately rare, but it should be unknown. The second is a beautiful picture, the beauty mainly lent by a magnificent cloud which was added by the mechanical photographer who made the slide as 'a pleasing background.' This is a common trick, but very improper. I remember a book describing a tour in the Mediterranean, illustrated by the author's photographs, in which he stated that the sky had been cloudless throughout. The eminent and popular firm who reproduced the pictures, however, inserted into each a background of homely English cumulus and stratus to fill up the ugly void. If scientific photographs are taken at all, they must be honest through and through; the natural sky alone can be tolerated in any picture for scientific use. Passing by such crude temptations to scientific crime, we come to the difficulty which may beset an honest worker in recognising the true nature of a particular phenomenon. Care must be taken not to be misled by appearances whose origin is different from what we suppose. Sparks from the funnel of a steamer on a very dark night were, to my personal knowledge, hailed in all sincerity as a group of the missing leonids; and a professor of astronomy is reported to have taken a lighthouse for Jupiter. A photograph is shown which can hardly be distinguished from a typical stratus cloud, yet it consists merely of wreaths of steamer smoke on a dead-calm, cloudless summer day. Another phenomenon, apparently meteorological, is the fine rainbow over Niagara Falls, the photograph of which was also taken on a cloudless day, although the raised umbrella in the foreground shows how effectively the fine spray from the falls simulates rain—perhaps it is what the biologists would term a 'mimetic resemblance.'"

It has happened more than once that just as we had firmly established our sciences upon a basis which seemed as unyielding as the Biblical rock, and had toilfully formulated theories that explained all phenomena with unvarying simplicity, some obscure experimentalist made a discovery which by no possibility could be twisted and moulded to fit the existing system, and, indeed, even challenged the truth of all established doctrines. Thus it was that Young and Fresnel overthrew the old emission theory of light with their experiments in the phenomena of interference; and thus our theories of chemical interaction, and even our conception of matter, may be modified by the researches made within the last few years in the field of the radio-active substances. What chemist formerly would for a moment have thought of attacking the law of Avogadro—the law which tells us that if the temperature and pressure be equal, equal volumes of different gases contain the same number of molecules? And yet a modern chemist, Lord Rayleigh, did find it necessary to test the truth of that law by precise determinations of the densities of well-known gases. If he had never studied the behaviour of nitrogen, or if he had considered the discrepancies which he observed in determining the vapour density of that gas, as errors due to defective observation, as many a chemist before him had done, argon and the other newly discovered constituents of the atmosphere might still be unknown, and many chemical doubts never aroused. Röntgen, too, found it necessary to revive theories of radiant matter which we thought we had long since refuted, and he supplied us with rays which we cannot yet explain. Becquerel increased our perplexity with his thorium and uranium rays. But when M. and Mme. Curie exhibited to our astonished eyes the results which they had achieved with radium and polonium, we were completely mystified, and were compelled to admit that there were more things in chemistry than our philosophy had dreamed of. Other chemists have also experimented with uranium, following methods different from those of the Curies, and have obtained additional active substances. Still another supposed element has been found to mock our periodic system. It has been discovered that thorium, when subjected to the action of acids, yields helium, and that thorium is often associated with radio-active substances. Helium and its gaseous companions on the one hand, the radio-active substances on the other hand, are mysteries which have so far completely baffled our chemists. And uranium and thorium, elements with which we once considered ourselves thoroughly familiar, are now to us as curious as if they had been but the discovery of yesterday. If the eccentricities of uranium, thorium, and helium, and the mysteries of Röntgen rays cannot be adequately accounted for by our existing chemical system, the question arises: Can our system be wrong? Chemistry is an exact science—at least we had flattered ourselves that it had been at last raised to that eminence. But an exact science is infallible, and we hear nothing of exceptions. Some day a chemist will be found whose mind, broad enough to grasp the scattered facts unearthed in the course of a century of research, will elaborate a chemical system which may prove as revolutionary in its way as the theory of Young; but which will embrace in its comprehensiveness those puzzling gases and radiant substances so utterly inexplicable at present.—"The Scientific American."

Astronomy in the Twentieth Century.—"What gravitation is, and how the heavenly bodies attract one another across empty space, seems about to be answered. Professor Fessenden, in a series of researches that will enable the astronomers of the year 2000 to stand on an elevation now unattainable, is correlating gravitation with electric phenomena of the ultimate particles of matter. But there is perhaps a more brilliant fore-glimpse of the future of astronomy to be obtained when we consider the recent progress in our knowledge of invisible types of radiation. It is probable," writes Mr. G. P. Serviss in "Invention," "that by the year 2000 astronomy will virtually have developed for man a new sense, through which will be revealed to him another phase of the universe as intimately associated with his being and destiny as is the visible phase with which we are familiar. By that time the curtain of mystery which now covers those waves of energy that, impressing us neither as light nor heat, sweep continually in from star-sprinkled space, may have been lifted. Such discoveries will require a new type of instruments. There will come an evolution of the telescope into something far more potent than the giant glasses of our day. A hundred

years ago all effort was concentrated upon increasing the visual power of telescopes. The only thought was how to see deeper into the heavens and see more. In the course of the nineteenth century that effort has resulted in multiplying power of the human eye about 40,000 times. It has made man potentially a colossus more than 1000 feet tall, for, a person whose eye could grasp as much light as the Paris telescope, would have to be magnified 200 times in all of his dimensions. And yet this astronomical Frankenstein cannot see the things that the new astronomy will have to deal with. If the power of the eye were increased a million times it would not suffice. With eyes as big as the moon we could not see those thousands of strange spiral nebulæ that hang like garlands in black space and whose presence is just beginning to be detected by other means. In the year 2000 astronomers will know what else those nebulæ do besides imprinting their images on photographic plates—will know whether their mysterious radiation has other powers as yet undreamed of. By that day photography will have aided us to create a new sense, of our own invention, superposed on the sense of sight, and then it will be time to test Mr. Tesla's idea that if we cannot see the inhabitants of other worlds, at least we can communicate with them. Imagine a person blind from birth suddenly endowed with the full powers of sight. The transformation and expansion that the world would undergo for him may serve as an image of the revelation that the year 2000 may have in store for the astronomers who have mastered the secrets of invisible radiation. The telescope of that age will be made not for seeing, but for transcending sight. Yet I think that the next century will witness an enormous development of our powers of seeing also. The telescopic colossus will continue to grow until its head virtually overtops the Alps. Following the lines laid down in the construction of the Paris telescope—a giant too unwieldy to stand upright, but, like Anteus, gathering power from contact with the earth—it seems possible to have object glasses, or reflectors, several yards in diameter. The present tendency to turn mountain summits into observatory sites is also likely to continue, and by 2000 A.D., with the aid of a mountain railroad like that which is now piercing the vitals of the snowy Jungfrau, gigantic telescopes may question the heavens from 100 lofty peaks. Shall we form acquaintance with the inhabitants of other worlds in the year 2000? If I were alive at that time, and privileged to use some of the instruments of discovery that will then be in existence, I would try their power upon the planet Venus. I would not expect actually to see people there, but if I perceived some unquestionable proof, or token of their existence, I would feel that astronomy had performed its part and vindicated its claim to be regarded as the leader of human science."

Scientific Co-operation.—Before the Mathematical and Physical Section of the British Association at Glasgow on Friday, September 12, Professor H. H. Turner, Savilian Professor of Astronomy, gave an address on the subject of scientific co-operation. It was a matter of considerable importance to astronomers, who had to deal with enormous calculations, involving millions of figures, that co-operation should as far as possible shorten the labour. For instance, the enterprise on which the Oxford University Observatory was engaged involved the measurement of a quarter of a million star images, and eighteen observatories scattered throughout both hemispheres were occupied in similar work. He further pointed out that the astronomers' experience might be of value to the devotees of other sciences. Possibly in the future mathematicians would find the need of co-operation, which consists in sharing a great piece of work among several workers, for the sake of comfort and rapidity. And in another science—zoology—the time might be close at hand when co-operation would be a boon, if not a necessity. Professor Karl Pearson and others were introducing numerical operations on a large scale, which promised further and further to increase, and they would no doubt be ready to indicate even now enterprises of a valuable kind from which they were only deterred by their magnitude. But it should be remembered that astronomical co-operation had not always been successful. The band of astronomers who at the end of the eighteenth century divided the sky among them and maintained a constant watch to detect a minor planet met with failure, for, by the irony of fate, the first discovery of the kind fell to another who was not engaged in any special search. Failure of a more real kind had overtaken enterprises to chart the stars or to map the moon. Yet a little more energy on the part of some one might have led to a satisfactory issue, especially if there had been supervision, a sort of foreman of the works. It did not seem unlikely that this general supervision was best performed by one not actually engaged in the work itself. One of our great London schoolmasters had declared that a nominally idle man should be at the head of all enterprises—that "he never knew any good come to any work where there was not a man with his hands in his pockets looking after it." The danger of attempting too much was illustrated by the Eros campaign. The 18 observatories had their hands full with the astrographic chart when there came a special occasion, which would not be repeated for thirty years, to determine the solar parallax. The 18 observatories could not refuse to take photographs, and this they had done, but the work of reducing and measuring them must throw back the chart work. A different kind of danger to which co-operation was liable arose from the necessity of binding the associating individuals by certain rules, which might have the effect of checking that originality which was almost vital in scientific work. We must not shut our eyes to the fact that astronomical work was terribly liable to settle down into routine, and we had already many small observatories where only routine work was carried on. The astrographic chart illustrated both the dark and the bright side. The danger of crippling individuality had been averted in an unexpected, almost a comical, manner. Rules were drawn up after many conferences, and the participating workers went off to their observatories with a copy in their pocket—and did not observe them. Such as they found convenient they adhered to closely, but when they found that a rule would not work they did not hesitate to prefer their own experience. This was the salvation of the scheme, for the rules which were broken were those which experience proved non-essential, and which ought never to have been made. Thus, when those who had actually carried out a considerable portion of the work met last July, they found that they had arrived at practically the same conclusion by a diversity of routes. The comedy of this result had a very serious significance, and there were reasons why we might heartily congratulate ourselves that the time was not yet come when astronomers were prepared to lose their individuality in a co-operative scheme of work; and still more that such schemes could be found where such loss of individuality was unnecessary.

Commercial & Legal Intelligence.

"Circular P.O.P."—Messrs. H. and W. Green, of the Crown Photo Works, Rotherham, are offering photographers accurately punched P.O.P. in 2⅝ in. and 4 in. diameters at one shilling the packet of each size.

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. J. S. Buckler, 19, Harlaxton-road, Grantham, for his negative, "Street in Andermatt, Switzerland."

Mr. H. Cornthwaite, of the Photographic Depôt, Imperial-arcade, Birmingham, draws our attention to the fact that he supplies to order stereoscopic transparencies of views of the United Kingdom, London streets and principal buildings, the Zoo, Glasgow Exhibition, beautiful flower studies, statuary, hoar frost, etc., etc.

According to an American contemporary, the St. Louis "Post-Dispatch" of July 21, the Seed, Cramer, and Hammer Dry Plate Companies, of that city, have consolidated under the leadership of Mr. George Eastman, of the Eastman Kodak Co., and Mr. Chas. Abbot, of the Aristo Manufacturing Co., of Jamestown, N.Y. The proposed capital of the great company will be about $30,000,000

Between twelve and one o'clock on Friday afternoon last there was an explosion of gas on the premises of Messrs. Bedford Lemere and Co., architectural photographers, 147, Strand. Some repairs to the gaspipes were in progress in a room on the second floor, when one of the workmen struck a light. Immediately there was an explosion, glass was shattered, and the contents of the apartment were partially wrecked. The upper part of the building also sustained damage. No one appears to have been hurt, and the fire which followed the explosion was soon extinguished.

Kodak, Ltd.—The directors have passed the following resolutions:—That an interim dividend of 1½ per cent. less tax for the quarter ending September 30, 1901, be and is hereby declared upon the preference shares; that an interim dividend of 2½ per cent. less tax be and is hereby declared upon the ordinary shares in respect of the quarter ending September 30, 1901, and that in addition a bonus of 2½ per cent. be distributed in respect of the six months ending June 30, 1901; that the above-mentioned dividends be payable on or after the 30th inst.; that the transfer books of the company be closed from the 24th to the 30th inst., both days inclusive.

A Warning.—Mr. W. H. Campbell, Photographer, 40, Duke-street, St. Helens, Lancashire, writes:—"I wish to make use of your widely circulated Journal to warn my fellow-photographers against a canvasser who has been in my employment three months, during which time he has acted fairly straightforward, but while serving his week's notice has put out a lot of bad business for me, and received money for which he failed to account to me. I did not know of this until I went to deliver the goods and collect money for work he said he had left. Therefore he has got away from me with a good character, and it is against him making use of this and obtaining other chances of defrauding that I wish to warn your readers. He is tall and of dark complexion, and undeniably an Irishman."

We have received a supplementary list of lantern slides for the season 1901-2 issued by Messrs. Wilson Bros., Lochhead House, Aberdeen. The following note explains the change in the name of the firm:—"In issuing their first annual supplement since acquiring the lantern slide branch of the business of G. W. Wilson and Co., Ltd., Wilson Bros. wish it to be understood that the only changes brought about by the transfer of the business to them lie in their being now sole owners of the concern, and in its being carried on in different and more commodious premises. The management is as before, the process and negatives used are the same, and the working staff remains unchanged." By special arrangement, the firm is still in a position to supply lantern slides of the great number of fine landscape negatives in G. W. Wilson and Co., Ltd.'s collection.

THE Warwick Competitions.—The following is the list of awards of the Warwick competition for the current month:—£10 prize, H. J. Dalby, Wellington-street, Woolwich, "Five Geisha Pictures"; £5, F. H. Stevens, 5, King-square-avenue, Bristol, "Entrance to Choir, Salisbury Cathedral"; £1, F. W. G. Cotsell, Extons-road, Kings Lynn, "Lantern Tower, Ely Cathedral"; £1, Miss M. C. Cottam, Burleigh, Churchroad, Bournemouth, "Children Picking Flowers"; £1, J. W. Eadie, Lenidale, Airdrie, N.B., "A Caucasian"; £1, W. H. Elwood, jun., Lumeah, Malone Park, Belfast, "On Deck"; £1, H. F. Griffiths, 53, Kilvey-road, St. Thomas, Swansea, "Shelley Tomb"; £1, Mrs. G. T. Harris, 326, Camden-road, London, N., "A Quiet Haven"; £1, H. J. Hadfield, 33, Harcourt-road, Sheffield, "View of Conway"; £1, T. Hartley, 19, Oxford-road, Waterloo, Liverpool, "Bolton Abbey"; £1, T. E. Innes, Heaton Chapel, "A Group"; £1, T. Johnson, 27, Oldhamroad, Miles Platting, "Bramhall Hall"; £1, W. R. Lallebury, 4, Lower Castle-street, Bristol, "Ancient and Modern"; £1, F. Little, Bristol, "The End of the Day"; £1, W. H. Marlow, Talbot-road, Isleworth, "Pleasure Steamboat"; £1, J. Peat Millar, Beith, N.B., "Bird Study"; £1, W. Morrison, St. James-street, Nottingham, "Portrait Study"; £1, J. Palmer, Clepstone-avenue, Nottingham, "Indian Actors on Parade, Glasgow Exhibition"; £1, H. Stockwell, Dewsbury-road, Leeds, "Sunset in the Wood"; £1, F. Tyler-Taylor, St. James-street, Monmouth, "Seven Sister Rocks, River Wye"; £1, J. Wilmore, Grammar School-road, Brigg, "Child Study"; £1, A. Wright, Whitby-street, West Hartlepool, "Child Study."

THE British Manufacturer.—In a recent Consular report, Mr. Vice-Consul A. C. Kerr, of Santiago, writes:—"In many different branches of commerce I find one opinion universally expressed, viz., that the British manufacturer spends a great deal too much money on catalogues and too little on an efficient staff of commercial travellers. A catalogue, however well it may be presented, does not accomplish anything like the work of a competent practical man. A catalogue quotes merely uninteresting prices and facts to a thousand different traders, whose requirements probably differ in proportion to their number, and which certainly do in different countries; the consequence is that the catalogue is thrown on one side, and the merchant in question eagerly seizes the opportunity offered to him by some commercial traveller who is on the spot, and who not only carries a most complete assortment of samples, but is ready to compete in the matter of prices, and even to offer to manufacture special goods suitable to the requirements of the country or district. He does his utmost to sell his articles, and the natural result is that an English retail store very often sells foreign goods when the storekeeper himself acknowledges that the British goods are superior in quality and lower in price. I feel sure that the British manufacturers should become more alive to the great advantage thus obtained by their foreign competitors. They cannot, and should not, rely upon retail merchants in foreign countries continuing to buy their goods simply because they have done so for the last twenty years, when German and American goods are offered at a lower price and of a description more suitable to individual requirements." And again: "British houses would do well to pay more attention to the question of language. A firm here informed me that they had a great sale, for instance, in a well-known gymnastic appliance, but that this sale was entirely created at their own expense, as all the pamphlets, books of instructions, and charts were sent out in English, and, in consequence, they had to expend over $700 (about £50) in translations and reprinting."

AN Impending Platinum Famine.—An incident worthy of the attention of all electrical engineering firms, says "Feilden's Magazine," was a recent debate in the German Reichstag on a Bill drafted with the object of obtaining a legal prohibition of the use of platinum where it can be replaced without serious inconvenience by some other metal, as, for instance, in photography [*sic*—EDS. *B.J.P.*], where it is utilised for platinum prints; and to limit its consumption to cases where its employment is essential. This debate struck a note of warning regarding an imminent danger, the full import of which appears not to be fully realised even among those who ought to be most concerned, but the restriction of the use of platinum in one country alone is hardly a practical measure for averting the dreaded consequence of a platinum famine. The problem is one of those that are eminently fitted for an international agreement, and should be carefully investigated by a commission composed of experts from all civilised countries. There is good reason, it appears, for anticipating a scarcity of platinum. Excepting, perhaps, iron, tin, copper, and lead, there is no metal that plays a more important part in modern industries at present than platinum, although its extensive employment is of very recent origin. Thus in the great chemical manufacturing processes there are operations in which it is practically indispensable, as, for instance, that of purifying sulphuric acid, for which platinum retorts are used—each of which frequently represents a value of £2000 or more—or various operations on which the accuracy of chemical analysis depends. Equally, or rather even more, important is the use of platinum in electrical engineering processes, or in the manufacture of electrical apparatus, and in the enormous number of incandescent lamps this metal has, as all our readers are aware, a very important function. It is, in fact, the only metal known around which glass can be fused. If we add to this that it withstands abnormally high temperatures, and that no acids, excepting aqua regia, will attack it, it is easily comprehended that, unless a substitute combining these qualities be discovered, the exhaustion of its supply would have a serious effect upon more than one industry.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject
25.....	Borough Polytechnic.....	Annual General Meeting.
26.....	London and Provincial.....	Discussion: *Self-toning Paper.*
27.....	Croydon Microscopical	Photographic Conversational Meeting.
28.....	Ashton-under-Lyne.....	Excursion: Dunham Park. Leader, Harry Williams.
28.....	Royal Photographic Society ...	Private View of the Exhibition.

FORTHCOMING EXHIBITIONS.

1901.

Sept. 20–Nov. 2 ..... Photographic Salon, Dudley Gallery, Egyptian Hall, London, W. Hon. Secretary, Reginald W. Craigie, Dudley Gallery.

,, 30 ,, 2 ..... Royal Photographic Society, New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.

October 29–Nov. 2 ... Rotherham Photographic Society, Drill Hall, Rotherham. Hon. Secretary, H. C. Hemingway, Tooker-road, Rotherham.

November 6–8 ..... Hackney Photographic Society, Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.

,, 23–30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.

Dec. 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

,, 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart, 93, Norfolk-street, Glasgow.

Patent News.

THE following applications for Patents were made between September 2 and September 7, 1901:—

VIGNETTING.—No. 17,600. "A Mechanical Device for imparting Motion to Photographic Vignette Printing Frames and Fixing or Developing Baths or the like." JOHN HOWARD BOSS.

CAMERAS.—No. 17,687. "Improvements in or relating to Photographic Cameras." JOHN WILKINSON and ALFRED WILKINSON.

EMULSION.—No. 17,950. "Process for the production of Photographic Chloride of Silver Copying Emulsions." Complete specification. HANS LÜTTKE.

PRINTING APPARATUS.—No. 17,960. "Improvements in Photographic Printing Apparatus." LEONARD SHAW.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE METRIC SYSTEM.

To the EDITORS.

GENTLEMEN,—Self-vindication is of little importance; but as there is a large number of people who mistake ridicule for argument, and who deem a quibble upon a side issue to imply a lost case, I ask just a line or two more in which to reply to Mr. Sutton.

My object in writing was to induce the uninitiated to believe that the metric system was infinitely more simple than ours, and that there was no necessity to trouble about intermediate weights that were seldom used. I said that I feared that I gave the Recording Angel a lot of work when I was called upon to put up, say, 8000 grains, or multiples thereof; and, much later on, I gave the "hecto" as being an intermediate metric measure used for butter, sugar, &c. Mr. Sutton's reply to this is, that if I weigh out butter or sugar with the English

weights I complain of, it is no wonder that I find trouble. I further deprecated the seeming necessity for "converting" the English weights into metric, thereby creating almost unmeasurable quantities, such as 64.8 mgms. of gold. The answer to this is, that I cannot be satisfied with the world revolving in an uneven number of days, and that I am incapable of making up uncommon quantities without a special measure. He infers what I do not even suggest, mixes up what I do suggest, and ridicules the sum total. If statements are not agreed with, there should be a categorical denial of them, or the fallacies shown up; but such criticism (?) tends in no way to the success of a discussion.—I am, yours, &c., S. E. PARKER.

65, High-street, Southend-on-Sea, September 14, 1901.

To the EDITORS.

GENTLEMEN,—Permit me to thank Mr. C. Welborne Piper and "J. F. F." for their answers to a query which left unnoticed the different standard temperatures of the English and metric systems, with consequent neglect of the co-efficient of expansion of water. The addition, however, of a sixteenth of a c. c. per fluid ounce to the gramme—equivalent of the dry ounce—is, as Mr. Piper observes, too ultra-refined for ordinary use. But I differ from him re conversions of formulæ. It seems to me that, in the absence of the publisher's own conversion, any which appear should be practically exact (but reduced to a standard total bulk of, say, a quart, or a litre), so that the user may, at his convenience, diverge from the formula to a recognised extent. For if the conversion be already divergent to an unapparent extent, additional divergence may cause confusion.—I am, yours, &c.,

September 13, 1901. J. D.

THE BACKING OF PLATES.

To the EDITORS.

GENTLEMEN,—I have read carefully Mr. A. Lockett's answer to my letter on backing of plates, and the peculiar halo around subjects light or dark, and must say that I do not find it quite satisfactory. First of all, this peculiar halo has never been noticed by any one, I think, in print until very lately, and never by me until six years ago. If natural, why not before that time? And again, if natural, why only on certain occasions? The peculiar effects observed on looking at a dark outline at night against a lighter sky may as well be the illusion of a tired eye, which is strained to see what cannot well be discerned in the dark, and then the dark line against a lighter object, moreover, at night may show this effect without it showing on a plate if photographed, even if taken at night, and probably less on an instantaneous exposure in full daylight. Now, since Mr. A. L.'s letter, I have looked at the subject more carefully, and with a powerful magnifying glass, and I have found that in a photograph from a variety of coloured subjects, such as black, red, grey, and white there is seen on all of them this peculiar halo, which is very narrow indeed, but on an enlargement can be seen very plainly; it appears, and does in fact encroach, on both sides of outlines, showing whiter on the white object and blacker on the darker one. This defect, and it may be called a defect, may be due, as Mr. A. Lockett says, to natural causes, but what I would like to know is, first, why it has not shown itself until lately, or a few years ago? and also why it will show itself only occasionally on slow plates as well as on rapid ones, backed or unbacked? I thought once that it might be due to conditions in the atmosphere, and be more likely to happen in stormy weather, as some of my results may tend to prove, but I cannot say, having not made any special trials to that effect. If agreeable, I can send you a proof to show this defect very plainly.—I am, yours, &c., A. LEVY.

Asnières (Seine), September 14, 1901.

To the EDITORS.

GENTLEMEN,—Messrs. A. Levy and A. Lockett have favoured you with interesting communications concerning the above, although they do not quite answer the point raised by me in my previous letter. I hope to obtain the information from practical experience. It seems clear that I have come to a too hasty conclusion with respect to the possibilities of Indian ink as a backing medium. Some time ago I made use of it, rubbing a wetted stick of Indian ink on the back of the plate, and then, before the ink had dried, a piece of paper, the size of the plate, was pressed on to the back of the plate. The method seemed to me to be convenient and fairly satisfactory. It would certainly seem to be axiomatic, as Mr. Lockett points out, that only preparations drying absolutely dull are suitable for backing mediums. My impression is that it is not worth while backing one's own plates. I intend, however, using Indian ink in the same way as above indicated on a subject that would certainly give halation if the backing were ineffective. I suppose that a suitable paper would minimise the effects of the glossy surface which Indian ink ordinarily used would present. My experience with backing mediums has not been extensive. I have, however, used plates bought ready backed occasionally, the mediums being, I assume, caramel and burnt sienna respectively. Both seem to be generally satisfactory, although I believe that the former has greater recommendations. I notice in your Ex Cathedrâ notes last week that bitumen dissolved in chloroform was recommended as a sure preventative against halation. It is generally well known that halation is greatly minimised when film is used. I believe that double-coated plates are recommended as a preventative. If they are, they would certainly be convenient when changing boxes and sheaths are used.—I am, yours, &c., J. A. R.

September 14, 1901.

THE WORD "TABLOID."

To the EDITORS.

GENTLEMEN,—Although it is generally known throughout the world that the title "Tabloid" is our registered trade mark, inadvertences occasionally arise in which this trade mark is misused. We therefore beg to call your special attention to the fact that the word "Tabloid" is an arbitrarily coined word or brand which designates specifically that goods supplied under this brand are issued by our firm.

This trade mark "Tabloid" may only be employed in connection with goods issued by us, and wherever this trade mark appears, we shall esteem it a favour if inverted commas are used to signify its proprietary character, thus "Tabloid."—We are yours, &c.,

BURROUGHS WELLCOME AND CO.

Snow-hill Buildings, London, E.C., September 14, 1901.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—The increase in the number of members to our Association is a healthy sign, and is distinctly encouraging; but while agreeing with "Free Lance" as to how we ought to direct our energies, it seems to me our first object in these initial stages should be to bring all our professional brethren into the Association. Union is strength, and the bigger the united party the greater the strength.

Let all, or the great majority, join us, and thus give us the sinews of war, by means of which we can carry out all these admirable suggestions. I should like to appeal to all those who have already joined to help by making it a point to tackle their neighbouring fellow-professional who hasn't joined. (Dear Sir, you have no idea what a jolly fellow he is!) The probability is he will find an erroneous impression in the mind of his neighbour as to our objects and ambitions; others he will find "have not heard anything about it," and another will say, "But what are its rules and objects?" At least, this has been my experience. Now, all the literature you can post to him is not half so good as tackling the fellow personally and chatting it over with him.

Look at it in this way. A man wants to bring some good article to your notice. He sends you leaflets, &c. How many of these do you read, and how many go into the waste-paper basket and are forgotten? Send a representative round, and the chances are increased a hundredfold of a sale being effected. Now I ask those members who have not used their conversational abilities to bring others into the fold to try them, and of the result I, for one, am confident. As for those critics, in and out of print, who are so ready to shout failure at anything new, without pausing to think whether the cause is a good one or not, well, their wish is father to the thought, for they generally have their own axe to grind; in others it is senseless drivel, so we can afford to ignore them.—I am, yours, &c.,

H. EDMONDS HULL.

136, Holland Park-avenue, September 14, 1901.

AN EMPTY BOX.

To the EDITORS.

GENTLEMEN,—We received with this morning's postal delivery a wooden half-plate box. This was wrapped in brown paper, and properly stamped, so it is evident that negatives and instructions should have been enclosed. The box, however, contains nothing but the packing put ready. We have thus no means of identifying the sender. Our only clue to the town being the postmark, which we make out as follows, "—ackpool," evidently Blackpool. We take this, our only means, of letting our friends know of the error, as we have evidence that they are readers of your JOURNAL.—We are, yours, &c.,

WHITTA PHOTO WORKS (B. G. MILLAR).

43, Whitta-road, Manor Park, London, E., September 16, 1901.

PLATINUM *V.* BROMIDE: A PLEA FOR FAIR DEALING.

To the EDITORS.

GENTLEMEN,—Notwithstanding the one-time craze for enamelled and highly burnished photographs, a steady improvement in the public taste has been for some time growing, and the vulgar glazed picture is gradually giving way to the matt surface. The higher-class firms,

more specially in the West End of the metropolis, and in the principal provincial towns, all do a good and rapidly increasing business in platinotypes, and other houses, even in the poorer class neighbourhoods, are following the lead, but there comes the rub, for many of these firms, in their endeavour to keep with the time, are at the same time unwittingly doing their best to kill the improved taste. These firms are advertising permanent platinotype prints at comparatively low rates, and are supplying their clientele with poorly finished bromide contact prints, which, in most cases, are far indeed from being permanent, and are calculated to make their purchasers fight shy of so-called platinotypes in the future. "The public can't tell the difference, and they are far cheaper to produce," so said one photographer. Both of these statements are incorrect. There is undoubtedly a certain section of the public who cannot distinguish between a bromide and a platinotype, but there is also a rapidly increasing proportion who can and do so distinguish, and who do not hesitate to declare that they have been swindled by the substitution of one process for the other. As to cost of production, there is very little difference indeed. Take as an example the cost of one dozen cabinet. So far as the production of the negative and the retouching the outlay is in each case the same, as it is also with the mounting. Then as regards the actual paper, the dozen pieces of half-plate bromide cost 1s. 2d., the developer and fixing, say, 2d. more, making a total of 1s. 4d., without allowing any margin at all for waste. In the case of the genuine platinotype, one dozen cabinet pieces of paper can also be bought for 1s. 2d., and the cost of developer and hydrochloric acid certainly falls far short of the 2d. required for bromide developer. Then a bromide print requires far more working up than a platinotype, which really requires very little, and even that little is effected with much more ease, as the surface is paper, and not gelatine.

So much for the cost; then as to the honesty. If a grocer or dairyman is detected selling margarine under the name of butter he is promptly prosecuted and mulcted in a heavy fine; butter looks much the same as margarine, both may be equally nourishing, but the substitution of one for the other is a fraud, and as such is punishable by law. Bromide and platinum also look much alike, but it is nevertheless as much a fraud to substitute a bromide for a platinum as to substitute margarine for butter. Why cannot our new Association see to this matter? Cannot it be made a rule that any photographer detected selling bromides as platinotypes be barred from membership of the Association, or even more stringent measures taken? The Pharmaceutical Society goes out of its way to prosecute chemists who sell certain plasters and liniments as other than they really are; perhaps the Photographic Association might see its way to take similar steps with regard to the profession. If a print bears on it the mark "permanent platinotype," surely, in the event of that print being proved to be merely a bromide or so-called "platino-bromide," the producer of the same must have placed himself in the position of having perpetrated a fraud, and is in that case liable to prosecution under the Merchandise Marks Act. Most readers will have in their memory a case which was recently decided, in which a certain firm of wholesale tobacconists were prosecuted under this Act, the offence being that they marked a certain tobacco as "hand cut," while it was in point of fact cut by machinery. It was proved that there was no fraudulent intent, but the name had to be altered. Now, in the event of a photographer being prosecuted for marking and selling as "platinotype" what is in reality nothing of the kind, I am of opinion it would go very much against him. The object of this letter is not to ask the Public Prosecutor to bring a test case, but to show the members of the profession that they are standing on very perilous ground, and to induce those who are so doing to come down from that standpoint on to the solid ground. If they advertise platinotypes at a certain price, let them supply what they advertise; if they think the public like bromides equally well, let them advertise them, and sell them as bromides. If a sitter orders a certain thing, and receives what he has ordered, he is likely to come back again and again, but, in the event of his discovering that he has been "done," he is not likely to risk it again, and will in all likelihood spread the fact far and wide among his acquaintances, so that even in the event of a little extra profit accruing from the deal it will in the long run mean a serious loss. The whole system is very much on a par with that of Tanquerey, who gives an enlargement for nothing, but compels you to buy a frame at a price which leaves him a very handsome profit on his "gift!"—I am, yours, &c., C. Brangwin Barnes.

THE THORNTON-PICKARD COMPETITIONS.

To the Editors.

Gentlemen,—Our prize competition closes on October 1, and we shall be glad if you will draw the attention of your readers to the fact that they have now very little time left in which to send in prints. Cash prizes to the amount of £105 are offered, particulars of which have been announced from time to time in your columns. Entry form and particulars will be sent post free on application.—Yours, &c.,

The Thornton-Pickard Manf. Co., Ltd.

Altrincham, September 16, 1901.

KODAK DEMONSTRATIONS.

To the Editors.

Gentlemen,—We shall esteem it a favour if you will kindly notify in the columns of your esteemed Journal that we are now prepared to arrange with the Secretaries of Photographic Societies for demonstrations of the following subjects during the ensuing winter:—

Development of Rollable Film.
Development of Dekko Paper.
Panoramic Photography, with examples of work.
Flashlight Photography, with Kodak Flashlight Cartridges.

—We are, yours, &c., Kodak, Ltd.

43, Clerkenwell-road, London, E.C., September 17, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

G. H. Wallace, 9, City-road, Chester. *Photograph of Miss F. Howley.*
F. Jennings, Friars Terrace, York. *Photograph of the Archbishop of York.*
F. Lewis, Stratford Studios, Kensington, W. *Photograph of Mons. Felix Gravé.*
D. Hedges & Sons, Clifton Square, Lytham, Lancs. *Photograph of homing pigeon.*
H. R. Mehew, Art Studio, Lynn-road, Wisbech. *Photograph entitled "Bachelors."*
E. Cuzner, 81, Oxford-street, Reading, Berks. *Photograph of Reading football team.*
A. McCann, High-street, Uttoxeter, Staffs. *Two photographs of "Abbots Bromley Horn Dancers."*
B. C. Peters, Brondeg Cottages, Aberbeeg, Monmouth. *Photograph of view of Abertillery, Monmouth.*

"Northern Light" and others.—In our next.

Signor Leopoldo Nobili (Reggio Emilio).—Dr. Grun's address is The Hall, Southwick, near Brighton.

Address Wanted.—A. W. writes: "Will you please tell me the address of Frith and Co., Printers and Publishers of Photographs, &c?"—In reply: The address is Reigate, Surrey.

Photo—Binocular.—We should prefer to have separate instruments. For observation at the distance named we have been recently using to our satisfaction a prism binocular of a power of 10.

Book on Retouching.—C. A. Neave writes: "Kindly inform me the best book I can get on retouching, and the price of same?"—In reply: Messrs. Marion and Co., Soho-square, W.C., publish such a book.

G.—As the negatives were so carelessly packed, and not marked "Fragile," you have no claim on the Post Office. Your only claim is against the one who sent them. But you will have to prove that they were broken through his carelessness.

Addresses Wanted.—A. B. writes: "Will you kindly give the names and addresses of the Secretaries of the photographic clubs in the Manchester district?"—In reply: See the Directory of Photographic Societies in The British Journal Photographic Almanac for 1901.

Book on Studio Construction.—H. Hellyer writes: "Would you kindly give the name of the best published book upon the building of photographic studios (up-to-date) and appliances connected therewith?"—In reply: Messrs. Marion and Co., of Soho-square, publish such a work. It is by Mr. Thomas Bolas.

The Fixing Bath.—John H. Hield writes: "Is there any objection to adding a few crystals of potassium metabisulphite to a solution of hypo for a fixing bath for plates, or for bromide paper?"—In reply: No, not for negatives; but for bromide pictures we prefer the hyposulphite of soda without any addition whatever.

Winter Evening Photography.—E. French writes: "Will you please tell me which is the nearest and most suitable winter evening institution for a lad of 15 to improve in photography generally?" In reply: Either the Polytechnic, 309, Regent-street, W., or the London County Council School, Bolt-court, Fleet-street, E.C.

Stains on Prints.—"Stains" writes: "Will you kindly let me know the cause of these stains on the enclosed prints? Is it careless washing or hypo? I have not had this trouble before."—In reply: The prints bear evidence that they have been splashed with something that has produced the red spots. What that something was it is impossible to say.

Calico for Backgrounds.—"One of Our Readers" writes: "Will you kindly inform me where I can get calico suitable for making backgrounds, about 8 or 9 feet wide?"—In reply: Get unbleached sheeting, which can be obtained at any of the large upholstery establishments, up to about 8 feet wide, if not wider. That is what is generally employed for backgrounds.

BLUE PRINTING.—"BLUE PRINT" writes: "Can you kindly inform me where I can obtain a book of instruction on the blue-print process, which I am thinking of taking up as a business, and of which I want all the information I can get?"—In reply: We can recommend "Ferric and Heliographic Processes," by Mr. G. E. Brown, published by Dawbarn and Ward, Farringdon-avenue, E.C.

PHOTOGRAPHY FOR THE PRESS.—THE HON. SEC. OF THE ABERDEEN PHOTOGRAPHIC ASSOCIATION writes: "In reply to 'Inquirer' in last week's JOURNAL regarding agents for press work, you say you do not know that there are such. I would ask you to refer to 'Photography for the Press,' published by Messrs. Dawbarn and Ward, Ltd., where you will find a notice regarding the Illustrated Press Bureau, Ltd., who act as agents for press photographers."

FUZZYTYPES.—"MAGGIE" writes: "Can you give me any information as to producing 'fuzzytypes?' I mean prints that have a soft appearance, not exactly out of focus, but fuzzy."—In reply: The patent portrait lenses of Dallmeyer have an adjustment by which any desired amount of diffusion of focus can be introduced at will. This will probably be what you desire. This firm also makes the Bergheim lens, which yields a larger degree of diffusion.

DIRECTORY OF PROFESSIONAL PHOTOGRAPHERS.—A. ROBINSON writes: "Will you kindly inform me if there is a directory published of all the professional photographers in the United Kingdom, and, if so, where I can obtain it? If there is no directory published specially, kindly advise me the best way to get hold of the names and addresses?"—In reply: Messrs. Percy Lund and Co., Amen-corner and Bradford, publish a directory of professional photographers.

GLASS POSITIVES.—"OXO" writes: "Can you please tell me the cause of the looking-glass-like marks on the glass side of the two positives sent herewith? I got an itinerant photographer while he was staying here to teach me the process, and I get on very well but for these mysterious marks."—In reply: The marks are due to the glass not being perfectly clean when the collodion was applied. It looks very much as if the final polish to the glass was given with a cloth that was not clean, or was damp.

TENANCY.—A. L. writes: "Two years ago I took this place, the studio being built, but unoccupied, at so much a year, the rent being paid quarterly. In June the landlord gave me a quarter's notice to leave in September. I am told that I ought to have six, and not three months' notice. Can you tell me if this is so, as I have worked up a decent little business, and do not want to leave?"—In reply: You are entitled to six months' notice to expire at the quarter at which you took possession, consequently you can remain till September next year, and your landlord must give you notice to leave in March next, to expire in September.

RESTORING DAGUERREOTYPES.—"WALSALL" wishes to know if there is any way of restoring Daguerreotypes. He has one which is quite tarnished and almost undistinguishable through age, &c. Can it be restored without damaging the plate?"—In reply: The Daguerreotype can be cleaned by treating it with a solution of cyanide of potassium—ten to twenty grains to the ounce. After the tarnish has been removed the plate must be well rinsed with distilled water and carefully dried. If you have not attempted the work before, and we imagine you have not, we should recommend you to entrust it to an expert, as it is very easy to utterly ruin the picture.

MEALINESS IN PLATINUM PRINTS.—M. BELL writes: "Would you kindly let me know what causes mealiness in plat paper? It has given me a deal of trouble. Sometimes the prints appear mealy all over, and occasionally streaks and little black specks appear. I carry out the formula exactly as the Platinotype Company give it, and I have proved it is not caused through insufficient development."—In reply: The trouble is probably due to the paper having become damp; or, it may be, the pads and backboards of the printing frames were damp while printing. The paper and pads must be perfectly dry, or good results will not be obtained with the platinotype process.

LENS QUERY.—W. THOMPSON writes: "Would you kindly let me know what kind of lens you recommend for interior work? I require one for a 12×10 camera. I want one that will embrace a very wide angle, and at the same time be rapid when stopped down. Cost of lens not much object, providing I can get hold of a good instrument."—In reply: What you ask for is an impossibility. No lens can be rapid when it is much stopped down, as one to cover a very wide angle must be. We should say that one of the anastigmatic type would be best for your purpose, inasmuch as it has a more evenly illuminated field than the older forms, and can also be worked with a somewhat larger opening.

FLASHLIGHT WORK.—"YOUNG PRO." writes: "As I am not an expert in flashlight work, I should be glad if you would give me a few particulars for taking a group (about 20) on a stage 30 feet long, the building being 15 feet high? Could I hire the necessary lighting apparatus, and about cost of same? Would an ordinary R.R. lens be quick enough with special rapid plate (12×10)?—In reply: What you desire to do is a little difficult for a novice to accomplish without some little practice. The picture can only be done with a very brilliant flash. Better make a few preliminary trials the night before, placing the lights at some little distance from the stage, and fired simultaneously. Possibly some of those who lend apparatus on hire would lend a flashlight one. A R.R. lens would suffice if the light is strong enough.

FERROTYPE CAMERAS.—T. W. G. MORRIS writes: "Could you inform me where I can get a ferrotype camera that will take a picture and finish it off in a few minutes? I have seen one doing so, but could not get information where to get it. The details are just like this:—He focussed his subject, and then he had a ball and tube similar to what an instantaneous shutter has, and he was moving it to and fro many times after exposure; and then he would have his plate put in a developing tank which he had by the side of his camera, and after he had finished developing it he would then wash it, and then draw his tongue over it, and after that he put a lighted match underneath to dry it, and his photo was finished for a little frame. I would like very much to have a camera to do the same kind of work, very handy for travelling."—In reply: Such a camera may be obtained of Mr. J. Fallowfield, Charing Cross-road, London, W.C.

SPOTS ON COLLODIO-CHLORIDE PRINTS.—J. AND J. BROWN write: "We are sending you parts of two photographs showing some hundreds of white spots. Will you kindly give us your opinion as to the cause of these? The papers are both worked according to the directions of the makers, which we enclose. These two prints have both been mounted a week, but the spots usually appear the second day after mounting. It is only during the last three weeks we have been troubled with this outbreak, and prints worked at the same time, and getting precisely the same treatment, but going on different mounts, do not get patchy. Can the mounts be the cause? The water that is used for washing is filtered through a muslin bag filled with cotton-wool." — In reply: It is impossible for us to say if the spots are caused by the mounts without testing them chemically. If you read the last paragraph, "Defects and their Remedy" on the instructions you enclose for working the paper, you will see that "white spots may be the result of impure chemicals, blotting-papers, mounts, or mountants, but are more likely to be caused by careless manipulation." We are inclined to think they are due to the latter.

DISPUTE AS TO CARD MOUNTS.—"PENARTH" writes: "A well-known firm's traveller called on me and got a small order for various mounts, with detailed instructions about printing. Facsimile of name and my card were handed to him. Over a month elapsed, and, having received no communication from the firm in question, I wrote asking them to be good enough to let me have the mounts as early as possible, and to state when I might expect them. In a few days I received a letter from them, which, to my astonishment, said they would not attend to my order unless I sent cheque for the full amount. Expressing my disappointment at not having been told so from the first, because the delay would be a loss to me, and a severe handicap, as I am only just starting in business, I sent the cheque, and after a few weeks I received the mounts, but with my name spelt wrongly, and the mounts, on the whole, not to my liking. Had the name been correct I would have accepted them. This firm says now that I am only to be blamed writing my name the way they chose to read it, and I am alone to bear the loss."—In reply: This seems a very unbusinesslike transaction on the part of the firm. If you gave a card with your name printed upon it, and it was properly spelt, your best way will be to return the mounts and sue them for the amount paid.

BANKRUPTCY MATTER.—"GIACOMO" writes: "Noticing in your reply in the September 6 issue of the JOURNAL to 'Salary—Bankruptcy,' I should like your advice under the following circumstances. I worked for a large country firm for some months, and they occasionally paid up, but at last I heard nothing more from them. I finally heard through one of the dealers that the firm had placed its affairs in the hands of a trustee. I wrote to the firm about the matter, and of a debt of £2 15s. I received a P.O. for 10s., not from the trustee but from the firm, and they stated that I should be paid up later on. Nothing further took place for some time, so then I wrote to the trustee, and received in reply a letter stating that the creditors had been paid a certain percentage, but he could not find my name on the list, and it had not been included. The trustee said this was all the better for me. From that time to this I have not received an extra penny of my money. Now I want to know if I come under the same law as 'Salary—Bankruptcy,' and should I have been paid in full for work done for the firm—it was not for goods supplied, but retouching done on the firm's negatives sent to me by post and returned by post? I may mention that the firm had been bankrupt once before, and previous to sending to me. Although I have not been paid the old account, the firm has sent me several batches of retouching to do, and has paid for them at the time, and I was frightened to detain the negatives, as they (the firm) had gone through the Court by trustee—at least I suppose that is what it amounts to, although I do not understand the procedure. What would you advise me to do? If I summon the firm, ten to one they would take no notice, as I have heard that a brother now owns the business, and that the one who owes me the cash is only manager there. A convenient arrangement. You may know the people."—In reply: You have no claim for salary as a servant. You are but an ordinary creditor, and as your debt was not included in the list given to the trustee by the bankrupt we imagine you can claim, in full, the balance of the account from those who contracted the debt, as that has not gone through the Court.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

A Missing Walled Plain in the Moon.

Photography has been of unparalleled use in many astronomical matters. Of late it has been investigating the composition of a new star, and we all know what it has done in telling us the story of the sun, as seen through the medium of an eclipse; but we think nothing so startling has been produced by a dry plate in astronomy as an event recently recorded in an interesting article by Mr. Maunder in the current number of "Knowledge." The photographic plate this month is of a particular region of the moon, taken by MM. Loewy and Puiseux at the Paris Observatory on September 29, 1896, with the great elbow-shaped telescope. Mr. Maunder points out that this photograph is a record of a walled plain that has now become, not only partially, but wholly submerged. "To the south-east of the Rophaen Mountains are two craters . . . and round the more southern of these is seen a broad, circular, dark marking that looks like the wall of an ancient plain that has been not only levelled, but even depressed below the surrounding surface by the action of the great volcano."

Perpetual Light. We are actually asked to believe by some of the London dailies, on the authority of their foreign correspondents, that a photographer in Chicago has discovered what is neither more nor less than perpetual light. The actual process is, of course, a secret, but its main lines are described as follows:—A combination of chemicals in a vacuum. These are placed in a globular glass vessel, then they "dissolve," and when their fumes fill the globe it is sealed. The gas inside then glows with dazzling intensity, and without consuming. The globe can be carried round and handled freely. The Chicago newspapers are said to rejoice that this discovery vindicates the tradition of the perpetual lamps of the Egyptian sarcophagi! It is not difficult to find the origin of this figment in the accounts of the new electric lamps which have been exhibited before a scientific society in America, but that the English public should be supplied with such rubbish as this shows either an intense gullibility on the correspondents' part or a belief in the supreme ignorance of the "man in the street" in this country.

* * *

New Modes of Obtaining Oxygen. We have referred to the startling news of perpetual light from Chicago, and we read intelligence almost equally startling about the production of cheap oxygen. There are sufficient details given to show that the process may be really a bonâ-fide one, but until more news regarding it is to hand we must hold our judgment in abeyance. The Geneva correspondent of the "Daily Mail" gives particulars he has received from M. Raoul Pictet, whose name is so honourably known in connection with the liquefying of gases. It has already been stated that this Swiss invention has been taken up by an English syndicate, and M. Pictet is stated to have said that it is the result of twenty-one years of experiment. To put the matter briefly, a special air-compressing apparatus is built, and, by taking advantage of the fact that nitrogen liquefies at -195^0 and oxygen at -183^0, the liquefied air is submitted to a process resembling the fractional distillation of the chemist—the process that separates various liquids by exposing their mixture to graduated temperatures. In M. Pictet's machine a series of ten divisions is made, and the gas is gradually passed through them, till at last we get oxygen of 90 per cent. purity. The cost is stated to be less than a tenth of a penny per cubic yard of oxygen gas. Naturally, if all these expectations are carried out, M. Pictet's dicta as to the future of the product are none too sanguine. The enormous waste of coals in metallurgy is to be done away with, solid masses of steel and iron will be autogenously soldered, the mining industry will be revolutionised, chemistry will be immensely benefited, and so on. But oxygen at the two-hundred-and-seventieth part of a penny per foot is rather a low estimate! We shall see. The next method for producing oxygen gas is of much more modest proportions. It has been patented here by M. G. F. Joubert, of Paris, Two hundred kilos of chloride of lime, at 35.5 per cent. of active chlorine, well dried (as, for example, by standing over concentrated sulphuric acid), are mixed with 78 kilos of sodium peroxide in powder. The yellowish-white powder thus obtained is subjected to strong pressure, till it forms into cakes. This compressed material is made into pellets, which are as hard and shiny as crockery. They are placed in water, and then decomposition sets in, and oxygen is given off with regularity. It is evident that, should they ever become marketable products, these pellets will require quite as much care (if not more) as calcium carbide in storage to avoid the absorption of moisture.

* * *

Exposures Then and Now. At the present time there appears to be quite a craze for excessive rapidity. A feature is made of the rapidity of lenses, the speed of shutters, and the ultra-sensitiveness of plates. All these are great acquisitions if they are utilised with discretion, but that is not always the case, particularly by the inexperienced amateur. He more often than not obtains the quickest plate in the market, and the most rapid shutter, and then uses them in season and out of season, always working at what may be termed "high pressure," the shutter set at its highest speed, no matter the subject or the quality of the light upon it. Frequently the shutter is set at fifty times the speed that is really necessary to secure what is required, and that, of course, involves the employment of plates of a very high degree of sensitiveness, and they, though all novices do not recognise the fact, are more difficult to manipulate than those that are less sensitive. Hence amateurs often do not get such good results as they otherwise would have done. The other day, when turning over the pages of our volume for 1859, we came across an article on "Quick versus Slow Processes," in which the author makes a remark that will apply to many of the results obtained under conditions such as we have just referred to. He says that he found a quick process he had practised all that was claimed for it in the way of rapidity, but adds that "it took just a fraction of no time to take an impression, and the impression generally proved to be just a fraction worse than none." Although this was written over forty years ago it is singularly apropos of many rapid pictures taken nowadays. As modern photographers, as a rule, have no idea of the times of exposure that had to be given in those days, we will quote from the article, in which the writer advises the worker to avoid extreme rapidity in all processes, and adopt a medium course. He then says:—"With a moderately strong light, from 25 to 60 seconds will usually warrant the best results in a Daguerreotype. With the ambrotype, from 25 to 50 seconds, and from 30 to 75 for a negative portrait. With a good light (100 feet of skylight) and chemicals to work at about these rates, I have been able to produce results that were uniform." In winding up the article he quotes the old adage, "Slow but sure;" yet it is one that might well be kept in mind by many modern workers of the high pressure type to which we have alluded. The exposures given above seem long. But it may be mentioned that "instantaneous" pictures were obtained by the Daguerreotype process, as well as by the wet collodion process, that were quite equal to those taken on gelatine plates. The late Mr. England's street scenes of Paris, and a similar series of London streets by Mr. Valentine Blanchard, to wit.

* * *

Clouds and Cloud Negatives. The end of September is now with us, and the time has arrived when many will be thinking of relinquishing outdoor photography until next season. Before doing so it will be well for them to consider if they have a sufficient stock of cloud negatives for use in printing from the negatives taken through the summer sea-

son, say, for instance, in making lantern slides. If not, now is the time for securing them with the stock of plates that may happen to be left over from the season's work, for, perhaps, during the whole year there is not such a variety of cloud effects to be seen as there usually is during the earlier part of October. For taking cloud negatives, plates that one would not care to take on a day's outing away from home, through their having been long in stock, may be utilised, as a slight iridescence around the edges is of little moment. One great fault with a beginner's cloud negatives is that they are frequently taken with the camera pointed too much to the zenith, so that they do not harmonise with the landscape with which they are used. Another is that the clouds are sometimes too pronounced; heavy stormy-looking clouds do not harmonise with a serene sunny landscape, though such are too often to be seen in photographs. In making cloud negatives, to be used for lantern slides when they are printed on the cover glasses, they should not be made so dense as when they are wanted for paper prints, otherwise they may prove too pronounced. When they are wanted for the latter purpose it is desirable that they should have some approximation to the density of the landscape negative, otherwise, particularly with gelatine papers, the sky will often tone to a different tint from the landscape. But when they are printed on the cover glasses of lantern slides the case is different.

* * *

Are Photographic Societies Useful to Progress?

This may seem a rather impertinent question to put, seeing the number of flourishing societies there are at present in existence. But still the question remains. One of the primary objects of a photographic society is the advancement of photography. The first rule of the Royal says its object shall be the advancement of photography, and the branches of science and art connected therewith. That rule is generally embodied, in effect, in those of most other societies. But how is it carried out at the present time so far as the scientific aspect is concerned? In the early days of the Society it appointed Committees to investigate certain subjects appertaining to the art. One was the fading of silver prints, and the report issued led to the abolition of the combined toning and fixing bath, and the substitution of the alkaline method of toning. Later on the Society appointed another Committee to inquire into the question of collodion and its manufacture. The old South London Photographic Society also had its Experimental Committee, which investigated various subjects in connection with the art. At that time there were but three photographic societies in London; yet it will be seen they were active. At the present time there are several subjects that require an authoritative investigation. For example, there is the alleged fading of gelatine negatives. There is the undoubted want of stability in the modern silver prints that requires to be inquired into, for there is no question that the majority of the prints made to-day are not so permanent as were those of several decades ago. We merely allude to these two subjects, though there are several others of paramount importance in connection with photography that, for the credit of the art, require investigation by some authoritative body. But what Society should undertake the work? If the Royal did, it would no doubt carry the greatest weight with its reports.

The Professional Photographers' Association.

In our reply to Dr. Nicol, on the 13th of September, we instanced the phenomenal success of the movement in favour of this Association, as shown by the rapid growth of the membership. In July the roll of the Association numbered about 400 members, and since then many other photographers have added their names to the list. We said that never in the history of photography had a paid membership of 400 been organized in so short a space of time. The statistics which have recently been published in the "Deutscher Photographen-Zeitung," concerning the growth of the Deutscher Photographen-Verein, emphasise in the most marked manner the strength of the movement in this country. Our friends in Germany have good reason to be proud of their Professional Photographers' Association. In the year 1900 it numbered 844 members, and it is doing excellent work. Yet we find that in 1876, when it was founded, there were only 35 members. The following figures are taken from the official report, showing the growth each year. To facilitate comparison, we have added a column showing the difference each year as compared with the preceding one:—

	Members.			Members.			Members.	
1876	35		1884	337	+53	1892	715	+55
1877	40	+ 5	1885	412	+75	1893	738	+23
1878	91	+51	1886	454	+42	1894	765	+27
1879	169	+78	1887	484	+30	1895	763	− 2
1880	236	+67	1888	517	+33	1896	776	+13
1881	250	+14	1889	564	+47	1897	806	+30
1882	253	+ 3	1890	607	+43	1898	816	+10
1883	284	+31	1891	660	+53	1899	840	+24
						1900	844	+ 4

It will be seen that it took the Deutscher Photographen-Verein nine years to reach a membership comparable to that which the Professional Photographers' Association secured in three months. The readiness of photographers to respond to the appeal for union is the most promising sign of the times which has been observed in the photographic world for many years, and every photographer who has the welfare of his profession at heart should give the association his earnest support.

* * *

Photographic Copyright in France.

The attempt which was made not long ago to alter the law of copyright in this country to the detriment of photographers must be fresh in most of our minds. The following case shows that the position of the photographer in France is somewhat different, although the plaintiff was successful in his suit. It appears that M. Cañellas had published a number of artists' studies, and amongst them one entitled "Etude de Nu." The copyright had been registered. Mr. Castanié wrote a book entitled "La Vierge de Babylone," and had a copy of the photograph in question published on the cover. M. Charles was the printer. The photographer sued the author and publisher for infringement of his right, and the Court having recognised that the photograph was a work of art, by the pose of the model and the drapery, ordered the defendants to pay 100 francs damages and the costs. The prints, which had been seized, were likewise ordered to be given up to the plaintiff. The point to which we draw attention is the necessity of the photograph being adjudged a work of art. In commenting upon this decision, the "Moniteur de la Photographie" speaks with satisfaction of the

fact that the decision again affirms that the work of the photographer is a work of art, and therefore protected by the same law as the work of the artist, as soon as it is shown that the arrangement of the model and the drapery discloses the personality of the author. This limitation is not imposed here, and we think photographers have good reason to be satisfied with the more liberal protection they enjoy under our law of copyright.

LESSONS FROM A FAMILY ALBUM.

Most householders possess a family album, and not a few lessons may be learned by carefully inspecting any example which contains photographs dating back from about the year 1860. Prior to that time what records are in existence of a family circle, or any member thereof, are generally met with in the form of Daguerreotype. The first thing to strike an observer who turns over the pages of any ordinary album containing photographs is, what it must be confessed is sad to relate, viz., the fading apparent in many cases throughout the entire period of time during which the various photographs have been taken. Next to this fading there is nearly always present a vast number of photographs that have sadly deteriorated by turning yellow. This latter deterioration is strongly noticeable in pictures of the vignette class, printed on single albumenised paper, whilst many of these same productions show, alongside of this discoloration, a large amount of fading in the half-tones. Any one conversant more or less with the working of collodion as practised in the early days of portraiture cannot fail being impressed with the marked difference in "cut" which collodion negatives have yielded when compared with the more recent productions of gelatine. Probably this expression of "cut" cannot be better explained than by saying that sharpness of detail and lines are more apparent when photographs are produced by collodion than is the case with gelatine, and even yet this peculiar qualification of collodion is recognised by process workers who have come to learn its advantages where certain effects in process work have to be produced. This "cut" is perhaps nowhere more noticeable than when studying the early productions in photography, in what years ago were termed vignetted C.D.V. portraits. Thousands upon thousands of such pictures must be in existence still, for these were very much the fashion about thirty years ago, and therefore should be within the reach of any one to study and compare with productions during later years by means of gelatine.

Many of these exquisite little portraits of the C.D.V. class do not measure more than one inch to one inch and a quarter, and include the bust-form of portrait when vignetted even in this. Yet how pleasant it is to compare many of these productions for fineness of detail alongside the photographs of recent years. A striking example of this came recently under our notice when looking at the photograph of a lady taken upwards of thirty years ago, the lady in question leaning over and inspecting these pictures at the same time. "Oh, there is my old lace collar that I prized so much; how wonderfully well the photograph shows the design." Such was the ejaculation of the wearer thirty years after being photographed with it around her neck. Now here we just have a striking example of this "cut" which collodion yields so beautifully. Had the same subject been photographed to the same scale by means of gelatine much of the design would have been clogged up. This fineness of detail is also noticeable in many other ways in our old collodion pictures. We see it in the manner in which the eyes of many of the sitters are rendered, and also in much that was worn in the way of adornment at that distant date, such as painted miniatures in brooches; these, on being inspected thirty years afterwards by means of a magnifying-glass, show a cleanness of cut and detail that no gelatine plate ever could yield. Probably the introduction of gelatine was accountable for the increase in size that soon became apparent in portraiture, and when the C.D.V. form was produced in later years by means of gelatine it will be noticed that the head and shoulders are rendered on a larger scale, the shoulders in many instances running out to the sides of the card. Many of these gelatine pictures are noticeable for a delightful softness and roundness which is partially attributable to the improved form of portrait lenses in conjunction with the softer outlines and printing qualities of negatives on gelatine. Yet, withal, to old workers in collodion, there is a subtle charm about the prints from a wet plate negative that only those who have had to learn by sheer hard work the gratification of producing such results can appreciate, for from first to last every act, from the cleaning of the glass to the preparation of his printing paper, had to be performed by his own hand. How different now; and yet in many respects it must be said photography has advanced, and no one would think of going back to his drudgery as of yore. Still it is no wonder that many are found who, on looking over their productions by means of collodion thirty years ago, prize these results by reason of the skill required in their production. In many instances most ludicrous results are seen among these early productions in portraiture. These are particularly noticeable in the accessories which were used by photographers who had the most outrageous ideas of art. Nine out of every ten of them, strange to say, had the audacity to blazon forth their title as artists. Many instances could be cited by any one turning over a family album; let one or two suffice. As we write we have before us the familiar figure of a dear old seafaring friend who, on arrival in port after a prolonged voyage, has placed himself under the tender mercy of the best photographer at that time in our chief seaport town. Here Will is depicted as standing in a veritable palace, with a vista showing water fountains in full play, his elbow resting on a pedestal draped with a coverlet abundant with tassels, whilst right behind his dear old face is draped a massive curtain, so as just to give a view of a book-case containing a mass of volumes that would require a skilled librarian to keep in order. Curtains have always been a useful accessory to the studio by reason of the fact that in skilful hands they can be made to yield graceful lines and balance to a picture; but how often in these earlier productions do we find curtains being made to produce the most incongruous results in lighting, for in numerous instances we see the curtains and background as representing the source of light, such as a window, whilst the lighting has actually been provided from quite the opposite side.

Again in posing, there is much to be learned and avoided. True we see not a few striking examples where such might with benefit be followed by any one interested in professional or home portraiture; especially is this noticeable in the many instances of children's pictures. One striking example which we see before us as we write is that of a young girl of about eight years ago, who is shown leaning delightfully easily as she looks at her picture book. The child's body is turned

sideways, with the elbow resting gracefully on the table, the forefinger and thumb just permitting the near cheek and chin to rest, as it were, upon the hand, while the off eye is just discernible beyond the profile. A more simple and natural production could scarcely be imagined. Truly much may be gathered in regard to posing by a careful scrutiny of an old album. Many of these family heirlooms contain examples of portraiture taken by amateur friends during more recent years, and here much may be seen that deserves close attention. If there is one thing more than another that lends a charm to what may be termed home portraiture, it is seen in the natural backgrounds which many of these productions display—a characteristic noticeable also in the work of several of our best professional workers, who always eschew the employment of any but what may be termed actual articles of furniture in their studios. In these examples of home portraiture the lighting, although more difficult to control than in a specially fitted up studio with its top light, is often seen yielding most natural results, for the high lights and shadow on the natural surroundings in the room yield quite a study in themselves. It is a pity more attention is not given to this form of picture by those who organize our public exhibitions, for by screening the full power of the light from an ordinary window by means of a gauze curtain a delightfully subdued light is obtained that can, with proper care, be made to yield pleasant portraits in home situations. Any one desirous of learning a few hints in printing will not be long before he will find out that in cases where it is desired to yield the best results in vignetting, the choice of a background plays a most important part. Where vignettes are wanted a light background should be selected, and there is no doubt that some of the smaller-sized head and bust pictures of the C.D.V. class so fashionable years ago are very attractive when viewed in an ordinary sized album. The old-fashioned full-length standing pictures, surrounded with often the most ridiculous forms of accessories and backgrounds, are certainly interesting, as showing the form of dress in vogue at the time they were taken. Many of these recall amusing episodes to those who can look back upon the different styles of dress worn at the time, and, all told, these kinds of pictures are not without interest, and it is a pity we do not see more of them produced at the present day. Especially is this noticeable in the ladies' dresses, from which in years after some fair estimate may be gathered of the period a photograph was taken by the style of dress worn. Some of our leading professional portraitists are giving more attention recently to the full-length form of picture than has been the custom for some time. True, the adoption of such a style of picture requires extra skill and care in posing, so as to avoid eyesores and mistakes in the appearance of a sitter's clothing, but full-length pictures are not without interest to many. The one great lesson to be learned from a close scrutiny of a family album is doubtless the liability of photographs to fade, especially those printed on certain classes of paper. This fading is also more noticeable in the case where sitters have been very fully lighted, and there is an absence of shadow or dark portions in the picture. A solid printed picture will first show signs of decay in the half-tones, the darkest portions not being so noticeable, and a black dress will appear to wear better in a picture than a lighter or middle tint one. If any one closely studies the numerous examples to be seen in any large family album it is more than likely that he will be forced to the conclusion that a lightly printed picture does not last as well as one printed darker and toned to a good purple black, whilst photographs enamelled by means of collodion seem to be proof against the fading so noticeable in other examples, where enamelling has been produced by means of burnishing; in the latter case the chief characteristic of such a treatment being their liability to turn yellow, whilst carbon prints, both in enamelled and simple form, are as permanent as any one can desire, any deterioration being generally attributable to an abrasion of their surface.

THE MEASUREMENT OF DIAPHRAGMS.

I HAVE read with great interest the recommendations of the Council of the Royal Photographic Society with respect to lens diaphragms, as published in the JOURNAL of August 2, also the article referring to the same subject in the issue of August 9. I am very deeply interested in these subjects, and hope, if in error, in the following, that I may be placed on the right track by some one who is able to explain the points questioned.

In measuring the forces of nature, it is necessary to recognise the character of that force by observing it at work, to recognise the signs of that work, and to give the force a scale of measurement according to its working capacity. It seems to me also that whatever numbers or scale be selected to express that measurement, they should at least express or have direct relation to the real value involved, so that we should not be compelled to say that "four times one is two," but "four times one is four," and "two times one is two," in the way that has proved so useful, and which has always been considered logical, or at least convenient.

For example: "One metre" expresses a certain linear distance, and the character of the relation between the unit and the value is such that if "one" be multiplied by "two," the product will not only be true according to the laws of numbers, but will also represent *twice as much value* as was expressed before by "one."

"One metre square" is equal to "one square metre;" but, if we are thinking of the "areal" value of a surface, we cannot say that "two times one metre square are two metres square," but "two times one square metre are two square metres." Which term then proves itself to be the true unit of areal value? Evidently "one square metre," since, in multiplying the unit, "twice one" means "two," not only in figures, but in the particular value expressed.

Could it not be laid down as a rule that if a number expressed a *true value* in any measurement, twice that number will express twice that value? Indeed, if "two" does not mean "twice one" when we speak of any value, it seems to me that we have not found the true value that should be expressed.

I cannot believe that the following law is correct: "The quantity of light falling on a given surface varies inversely as the squares of the distance from the source." First, because calculations by this law are lost in error on the slightest departure from certain prescribed conditions in approaching infinity. For example: Suppose a so-called "point" of light be 1 cm. from a surface which has an area of one square metre. We see a spot of illuminated surface close around the light, and a swift approach to shadow all around the edges of that illumination.

Now suppose that sufficient surface were added around the edges of the first surface to make an area of two square metres in all, according to the advocated system of measuring diaphragms, could the extra metre added around the edges of the other be said to receive as much light as the original surface of one metre in the centre of the plane?

Again, if a surface having an area of one square cm. be illuminated by a light surface of one square metre at a distance of 1 cm., and that surface be moved to a distance of 2 cm., is it true that the light value or the illumination of the small area would be only a quarter of what it was when the light was 1 cm. distant?

If this law thus loses itself in error in dealing with surfaces as finite and measurable as one or two square metres and with one or two cm., what can be said in favour of it as a law?

If a cylinder 4 cm. long and 10 cm. in diameter have one end removed, that end will admit to a point at the centre of the other end light from $\frac{3}{16}$ of all surrounding space. (This opening corresponds to a section of a globe surface measuring 102° 38′ 8″ in diameter, which section is $\frac{3}{16}$ of the globe, and which, therefore, must admit light from the same fractional part of all space.) Now, according to the accepted law, if this cylinder be enlarged to 20 cm. in diameter it must admit light from four times as much space, which would be $\frac{12}{16}$ of all space. Now, the problem of making light enter a hole and fall on a point from $\frac{12}{16}$ of all space is beyond my comprehension.

But let us carry the supposed law one step further, and make the cylinder 40 cm. in diameter instead of 20 cm., and it must, of course, admit light from four times $\frac{12}{16}$ or $\frac{48}{16}$ of all space. This is three times as much radial space as is measured by a globe surface in relation to its centre and six times as much as is occupied by the sky above a true horizon, and is, of course, the statement of an absolute impossibility.

There are many laws which are true and fundamental, but whose workings become practically negligible in infinity. For example: "Only one point on a plane surface can be nearest to a confronting point in space." If a plane be 1 cm. in diameter and a point of measuremeut be placed in contact with its centre-point, the distance from its centre to the point of measurement would be "0," and from that point of measurement to the points on the outside of the plane surface m. ·005, a difference which no multiplication could ever span. If the centre of the plane m. ·01 in diameter be 50,000,000 miles from the point of measurement, the distance farther to the points on its edges (supposing the plane to be at right angles to the measuring point) would be "negligible," although it is as evidently true in our mental picture of the law as though the plane were only m. ·01 from the point of measurement. In fact, the very truth that exists within the term, and is understood to be excused by the term "negligible," is the truth that marks the difference between a plane and a globe surface. This truth we understand by the following: If the small surface were in all its points exactly 50,000,000 miles away from a certain point and it should be extended 78,540,000 miles outward into space, it would surround the point of measurement as the half of a globe. However, if we recognise to exist within it that small negligible difference, which is the very truth that establishes it in its character as being the section of a plane and not the section of a globe, and it be imagined to extend outward 50,000,000 miles into space, it would do so as a plane, and its edges would form an angle of 90° in relation to the point of measurement; furthermore it could never, even in infinity, be extended to a distance from which its sides would occupy a relation of 180° to the point of measurement; a relation which is occupied by every plane surface, either large or small, in relation to each point within its borders.

It is seen, then, that that which is "negligible," because of its small value, is in reality the distinguishing characteristic between different truths, and can never become an error in infinity, for that reason.

For these reasons I cannot comprehend how a law (?) could ever have been accepted in practice, that will make six times the expanse of the natural sky pass through an opening 40 cm. in diameter, and strike a point 4 cm. from the centre of its plane.

Notice that this error has not even the false excuse of "infinity," but glaringly asserts itself entirely within the values that enter common practice.

More than this, I cannot understand what natural relation exists between surrounding space from which light comes and the system of measuring that space.

The simplest law of space, and one with which we all come in contact every day, is that every point on and within the border of a plane surface is confronted by the half of all surrounding space, the other half of that space being occupied by the material composing the object on whose surface the plane is located.

This plane measures to its individual points half of all space more positively and calculably than any diaphragm ever did in relation to the points on a screen or plate, but that value it would be impossible to either measure or express by the *f* system, because, if an opening be at a distance from an illuminated point, that opening could be enlarged to infinity, and it could never become so large as to measure half of all space to that point; while at any size that it might have, if the point illuminated should be moved up into the plane of the opening, that opening would occupy half of all space in relation to it, and, as I have said, it would make absolutely no difference how large or small the opening may be.

In my opinion, so long as this law of the area of plane surfaces is applied to the calculation of a natural force with which it has nothing in common, there will be very little advancement made along lines of the simplification of space measurement, which is half of the great double law, by which light performs its work.

But suppose that the calculations are correct, and we have a condition before us which necessitates one second exposure with diaphragm *f*-16; we find by the method that *f*-32 will require four seconds. Verily, it seems to me that when we get to that stage in the development of our capacity for logic, where we can calmly and wisely plan to make 32 represent four times the value that we express by 16, we certainly ought to be well satisfied with our progress, for there is no doubt that "2 × 1 is 2" is getting "awfully common," it has been used so long.

F. M. Steadman.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The sixth Rule of the Professional Photographers' Association is as follows:—

"6. *Ordinary Meetings.*—The Ordinary Meetings of the Association shall be devoted to the discussion of matters concerning the welfare of Professional Photographers and the profession only. They shall be held on the first Fridays in February, April, June, October and December. The Committee may call Extraordinary Meetings when they may think it advisable."

In accordance with this rule the next ordinary meeting of members of the Association will be held on Friday evening, October 4, in the rooms of the Royal Photographic Society, 66, Russell-square, London, W.C., kindly loaned for the purpose. The chair will be taken at 8 o'clock.

Last week we reported the formation of the Hull and district branch of the Association with Mr. W. Barry (Hull) as Chairman, and Mr. T. C. Turner as Hon. Secretary.

An immediate result of that meeting was the addition of eleven new members to the Association whose names will be found in the appended

Sixth List of Members of the Association.

Abba, D. (C. D. Abba & Son), 20, Craven-street, Hull.
Abba, H. (C. D. Abba & Son), 20, Craven-street, Hull.
Clare, Joseph, 22, Station-street, Port Talbot, Glamorganshire.
Delf, C., Clarendon-street, Hull.
Fox, Christopher (A. E. & C. Fox), 4, Commercial Buildings, Bridge-street, Bradford.
Fussey, W., 43, Great Thornton-street, Hull.
Hardie, Fred, W., 416, Union-street, Aberdeen.
Hogg, James Henry, 71, Stricklandgate, Kendal.
Holborn, Arthur, Graphic House, 25, Stokes Croft, Bristol.
Holloway, Edith F. B. (J. Holloway), 32, Cambray, Cheltenham.
Holzheimer, L., 135, Porter-street, Hull.
Howlett, Joseph, 97, Hessle-road. Hull.
Jones, Charles, 47, Wincolmlee, Hull.
McLucas, Allan (McLucas & Co), 192, Soho-hill, Birmingham, and Vaughan-street, Llanelly.
Pettingell, Edmund, 20A, Saville-street, Hull.
Phillips, Ernest Edward, 37, Bond-street, Hull.
Roddinson, T., 7, Rosebery-avenue, Hull.
Roxburgh, Andrew E., The Studio, High-street, Cawdenbeath, N.B.
Simons, J. T., 8, Springfield-lane, Salford, and Nutford House, Castle Mona-avenue, Douglas, Isle of Man.
Spencely, David Robert, Main-street. Littleport.
Spurr, Reginald (Spurr & Son), Bridlington, Yorkshire.
Watson, Robert Thomas, 70 & 461, Anlaby-rd., and 1, Midland-st., Hull.

The foregoing list takes the Association well into the Fifth hundred of its membership, and great praise we think is due to Mr. Turner, Mr. Barry, and their coadjutors for the excellent service they are rendering in the work of organization. Already the example set at York and Hull is producing good results in other parts of the country. We understand that Mr. Frank Moffat, of the highly respected and old-established studio of John Moffat, 125, Princes-street, Edinburgh (a name of great renown in the annals of Northern professional photography), has consented to accept the local Honorary Secretaryship for Edinburgh and district. Mr. Moffat has called a meeting of the local photographers to take place in his studio at the above address on Monday evening, September 30, at 8 o'clock; and we are pleased to learn that he has already received many promises of influential support. We cordially wish our Edinburgh friends success.

There is a paragraph in our "Ex Cathedrâ" pages this week, bearing upon the rapid growth of the Association, which, no doubt, members will read with pride. Last week Mr. H. Edmonds Hull, an able representative of the new school of professional photographers, made an eloquent appeal to his confrères to lend practical support to the Association, and in the correspondence columns of the present number of the JOURNAL "Northern Light," a pseudonym which conceals the identity of an energetic country professional man, puts forth a similar plea. There never has been within our recollection so keen and widespead a desire for union amongst professional photographers as at the present moment. The fostering of that feeling, and the steady work of organization during the next few months will, we are convinced, ultimately result, to quote from a letter before us, in raising "the social and business status of professional photographers."

The Edinburgh meeting on the 30th ult. will be followed by others which it would be premature to name. Meanwhile the P.P.A. Handbook, together with a supply of membership application forms, is this week being sent to all existing members of the Association. We might in conclusion mention, as showing the general interest taken in the work of the Association, that at the opening of the winter session of the Polytechnic School of Photography, 309, Regent-street, London, W., on Tuesday, October 15, the principal, Mr. E. Howard Farmer, will deliver an address on a subject of interest to the Association and professional photographers.

PROFESSIONAL PHOTOGRAPHERS AND THE PLATE-MAKERS' ASSOCIATION.

WITH reference to the subject of plate-makers' discounts to professional photographers, we recently received the following letter from a well-known manufacturer: "May I go back a little? When the amateur first became a power in the land, who snubbed him and refused to cater for him? His wants were many, and the chemists saw it, and laid themselves out to fill his needs. Now the trade is built up, who wants to seize it, and at the same time, buy for their own needs at better rates? When the cutting was rife, who complained bitterly that the amateur bought as cheaply or cheaper than they did? Now the amateur must pay full prices, who is still dissatisfied? When cutting was rife, who knew on what terms to buy? The man who worried and importuned got such terms as he could, in most cases better terms than his competitor, a larger buyer, who did not worry. The Association has stopped the amateur buying below list prices, has levelled up terms to professionals, so that all buy on fair and equal terms, according to their volume of trade. Who buys from hand to mouth, instead of buying fair quantities at a time, and so get fair discounts? You probably do not know that the present discounts to professionals are better than they were before the Association started! He can buy 20*l.* worth (all makes mixed) at a rate to leave the dealer only 5 per cent. profit. Is this exorbitant? He can thus do a dealing trade at almost the same profit as the dealer, and get his own goods at same rates for studio use. Is it right that the dealer, whose only profit is on the resale, should be put on the same terms exactly as the professional whose profit is on his work? Nevertheless, never a meeting of the Association passes but full dealer's terms are granted to professionals, who prove their bonâ fide intention to go into dealer's business. Yet only those inside know how small a percentage really continue to do a dealer's trade. There are dozens of professionals who have been granted dealers' terms who do nothing towards being centres of distribution of the makers' plates and papers, and yet they retain their full dealer's terms. Is this fair? Some few deliberately buy an assorted stock ostensibly for dealing, and drop it at once. Most have neither time, staff, nor business ability to work the dealer's trade properly. Those who continue to deserve full terms are known, and their trade is appreciated, and they are admired. We do not grudge it to them, any fair means of putting and keeping stock before the public is welcomed whether the man is a chemist, a bookseller, or a photographer, all are equally welcome."

The relations of the Plate-makers' Association with professional photographers have lately provoked considerable comment in our pages, and thus the letter of our correspondent reaches us at an opportune moment. It is the first time that the case for the Plate-makers' Association has been put so fully. The letter, while breathing no spirit of antagonism to the professional photographer, not unnaturally leans to the side of what our correspondent, "Northern Light," on page 622 of this week's JOURNAL, describes as the *bonâ-fide* dealer. This gentleman even goes so far as to suggest that legitimate photographic dealers should be asked to co-operate with the Professional Photographers' Association as honorary members. The practicability of this scheme is obviously open to criticism, but there cannot be any doubt that, in his words, "the real parasites of professional photography are a certain set of chemists, opticians, &c., who in addition to dealing are willing to do professional work," and other classes of persons whom he specifies. He rightly suggests that the Professional Photographers' Association should deal with these matters. Meanwhile, to revert to our subject, the above-quoted letter from our manufacturing friend should clear away many misapprehensions that have existed with reference to the subject of professional photographers and plate-makers' discounts.

EFFECT UPON THE PERSISTENCE OF VISION OF EXPOSING THE EYE TO LIGHT OF VARIOUS WAVE LENGTHS.*

[Reprinted from the "Physical Review."]

IV.

BEARING OF THE FOREGOING RESULTS UPON EXISTING THEORIES OF COLOUR SENSATION.

The Hering Theory.

According to this theory, as is well known, the colour sensations are arranged in three pairs, red-green, yellow-blue, and white-black. Since the first sensation in each pair is produced by the dissimilation of a supposed photo-chemical substance, which exists in three forms to correspond to the three pairs of colour processes, it would be expected that all being affected in precisely similar ways would show similar results. One would also expect the assimilating colours to show opposite effects. Whatever effect is produced by fatiguing the retina with red, an exactly similar effect should be shown with the yellow. So also for green and blue. Reference to the curves shows that red has an elevation in the red, while yellow gives two, neither of which corresponds to that colour, and white gives none, or rather the whole curve is elevated above the normal. Similarly for the others—green has one, blue two, and black none, if we may consider the curve obtained by blindfolding the eye as the one corresponding to black. We thus have three types of curves for the three pairs of colour sensations. The agreement in number is the chief point of harmony with the Hering theory.

Analysing the curves more particularly, we may observe, first, that acting on the red-green substance with red light has dissimilated it, producing a characteristic result. Assimilating this same substance with green light produces a similar result but in the part of the curve corresponding to green. Certainly the theory would expect each operation to affect both red and green parts of the curve, or else each would affect one and the same part, but in different ways. Violet, too, giving a result similar in every way to those produced by red and green, must be placed on an equal footing with them, and whether it be considered as a dissimilation or an assimilation colour its opposite must be found in the spectrum. Exhausting the retina with yellow discloses no special substance that is acted upon, but elevations are produced in both red and green. Translating this into the language of the theory, yellow simultaneously exercises the functions of both red and green to the same percentage amount, as we have seen, as each of them separately.

* Concluded from page 585.

Under these circumstances a balance should have been maintained between the opposing actions of red and green, which should have produced a curve differing in no respect from the normal. Supposing, however, that the action of the yellow stimulus is in harmony with the requirements of the theory, exposure of the retina to its assimilative companion blue ought to counteract the effects previously produced. Experiment shows that the green is affected, but in addition the violet is also affected, which was not disturbed at all by the yellow. Further, by stimulating the retina with strong yellow and blue lights alternately, the red-green substance could be overbalanced, and red-blindness induced by the action of certain luminous waves which, according to theory, should have no effect in this direction. It is quite evident, therefore, that these experimental results are antagonistic to the theory in question. The curves obtained when the eye was rested in the dark and fatigued with white light at first sight seem to confirm the Hering theory; but, since in both cases all the colour sensations are affected, there must be an intimate connection between white, black, and the colour processes. This, too, is not in harmony with the provisions of the Hering theory.

The Ebbinghaus Theory.

The same objections will also apply to the theory of Ebbinghaus[13], which is practically a modification of that of Hering. The main difference is that, while the latter postulates three visual substances which may be regarded as so many independent variables, the former separates these substances into four for the perception of colour and

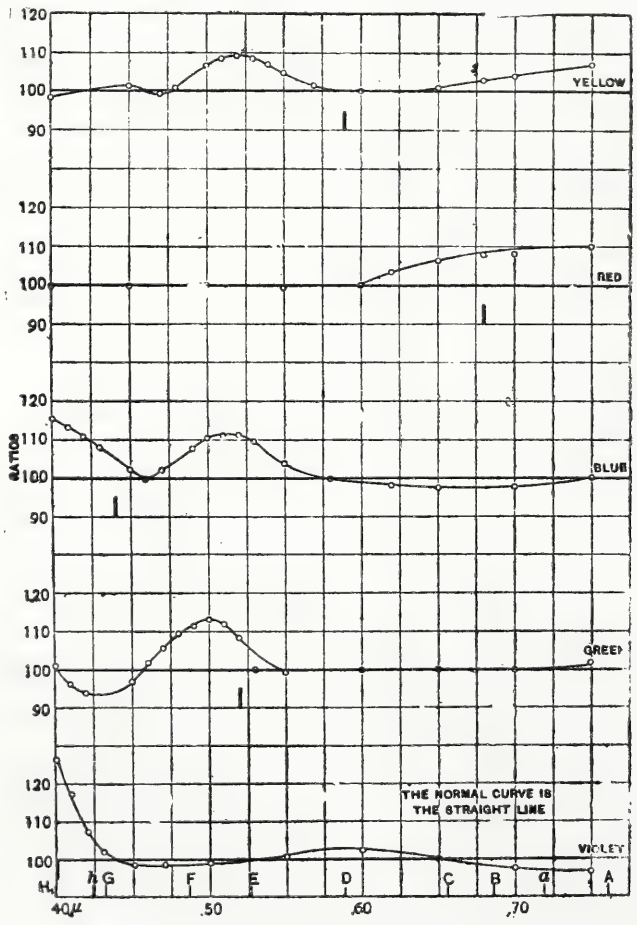


Fig. 12.

one for white, making in all five independent variables. The fundamental colour tones in this theory are the same as in that of Hering, viz., red, yellow, green, and blue, two of which, yellow and blue, have been shown to be compound.

The Franklin Theory.

The ingenious colour theory of Mrs. Franklin[14] is framed partly from the physical and partly from the psychological standpoint. This evolutionary theory regards colour-sense as a development out of an earlier existing gray-white sensation. Guided only by the requirements of consciousness the fundamental colour tones would be red, green, yellow, and blue. But physical experiments have rendered it improbable that yellow is fundamental, so the theory is resolved into a three-colour one, with a gray-white sensation in addition. Consciousness must be satisfied with only a part of its demands. The experiments described in this paper are equally fatal to both blue and yellow as fundamental sensations, but can be considered hostile to this theory only as regards the blue. Mrs. Franklin might then go one step farther and assume the Young-Helmholtz colour-sensations by the substitution of violet for blue.

The Young-Helmholtz Theory.

The experiments we have described are plainly seen to harmonise completely with the fundamental colour processes of the Young-Helmholtz theory. Red, green, and violet being these fundamental sensations, give characteristic results in an abnormal condition. Yellow and blue are both compounded of two other sensations, and experiment shows the theory verified. Rest in the dark makes all sensations more sensitive, which is shown by the curve obtained under this condition. The curve obtained for the action of white light, however, cannot be disposed of so easily, and, as before, we must consider it as evidence in support of a white sensation. There are many other colour theories; but these we have considered may be considered typical of all.

At the suggestion of Dr. Nichols these curves have been drawn in another way which shows the deviations of the abnormal from the normal curves in a much more striking manner. All parts of the normal curve are reduced to the same ordinate, making that curve a straight line parallel to the axis of abscissæ. The corresponding values of the abnormal curves are then reduced in the same ratio, and these ratios plotted. For convenience the ordinate of the normal curve is taken as 100. The variations from the normal, discussed in the preceding pages, are much more evident especially in the parts corresponding to the blue and violet regions of the spectrum. It is evident that this is a representation of what would actually have been obtained, had all parts of the spectrum possessed the same luminosity.

Only those curves obtained when the eye was fatigued with various colours and with white light are so reduced, as the others do not show their characteristics any better by this method. The five colour curves are plotted together for comparison in fig. 12, the white in fig. 13. In addition the same curves are plotted in fig. 14, with

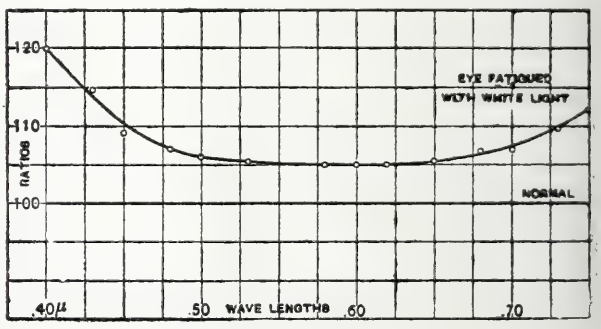


Fig. 13.

circle readings as abscissæ instead of wave lengths, which represents the conditions of experiment more accurately, as the observations were made on a prismatic spectrum.

In these last diagrams the part of the spectrum used for fatiguing the eye is marked by means of a vertical line under the respective curves.

Summary.

The results arrived at in this investigation may be conveniently summed up as follows:—

1. The persistence of all colour impressions reaches a maximum when the eye has been kept open in the dark, the increased duration being unequal for rays of different refrangibilities. The increase is least in the yellow, and grows larger towards both the red and violet. The curve obtained under such conditions may be called the *extraordinary* normal curve.

2. The persistence of all colour impressions is a minimum when

[13] Ebbinghaus, Theorie des Farbensehens. "Zeitschrift für Psychol. und Phys. der Sinnesorgane," Bd. V., Heft 3, 1893.

[14] C. L. Franklin, On Theories of Light-sensation, "Mind," Vol. 2, N.S., No. 8, 1893.

the eye is under the influence of diffused daylight. The curve thus obtained has been termed in this paper the *ordinary* normal curve.

3. When the eye has been blindfolded the values of the persistence in all cases are intermediate between the extraordinary and ordinary normal curves, showing, however, unequal increases as in the extraordinary curve.

4. When the retina has been exposed to strong red, green, or violet light, the persistence of impressions of the same colour as the fatiguing light is increased, forming a characteristic elevation or bunch in the part of the persistency curve corresponding to that colour.

5. When the retina has been fatigued with yellow or blue light there is no increase in the persistence of impressions of those colours, but the characteristic elevations are produced in the parts of the curves corresponding to red and green or green and violet respectively.

6. These phenomena strongly confirm the fundamental colour sensations of the Young-Helmholtz theory.

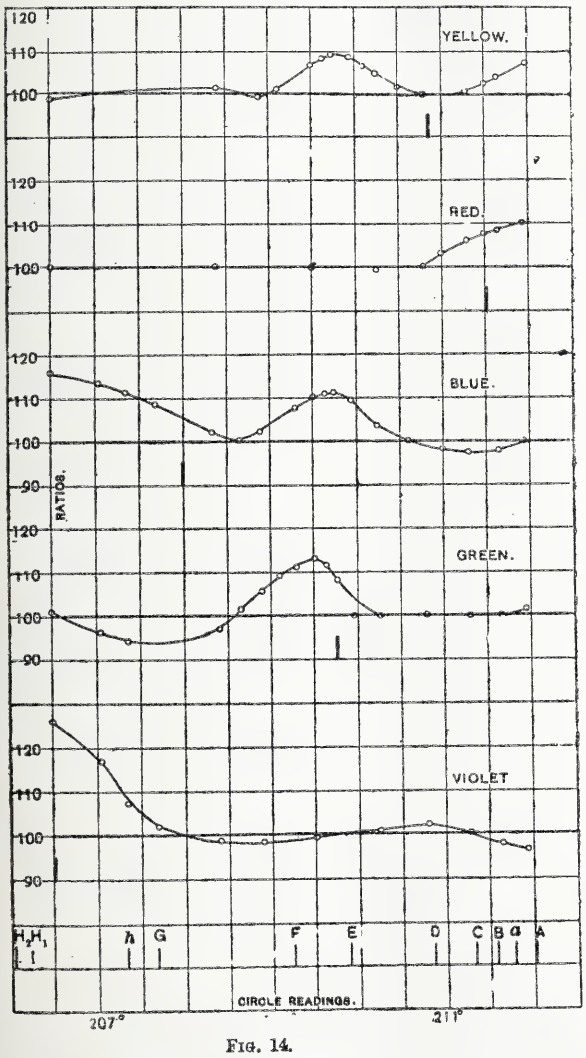


Fig. 14.

7. When the retina has been fatigued with white light, the persistences of all colour impressions are unequally increased. This apparently does not harmonise with the Young-Helmholtz theory, but indicates a partially independent white sensation.

8. Both rest and fatigue of the retina cause an increase in the persistence of all colours. No explanation of this fact has yet been found.

9. In the case of naturally colour-blind eyes, the persistence of colour impressions to which the retina is blind is abnormally increased, thus affording a method of determining the wave lengths to which the retina is incapable of responding normally.

10. In addition to the loss of one fundamental colour sense, the naturally colour-blind retina may also lack the power of responding to a group of waves affecting another sensation. The further study of cases of colour blindness in this way would probably throw new light upon this interesting and important subject.

In conclusion, I wish to gratefully acknowledge my indebtedness to Professor E. L. Nichols, who suggested the subject and method, and also to Mr. J. S. Shearer, of the Department of Physics, for their many valuable suggestions regarding both apparatus and the experimental results of the entire investigation.

Physical Laboratory, Cornell University. Frank Allen.

THE PHOTOGRAPHIC SALON.

The ninth annual exhibition of the Photographic Salon, which opened at the Dudley Gallery, Piccadilly, W., on Sept. 20, is a distinctly better show than any of its predecessors.

The Salon has always been the homestead of those photographers who have regarded art and eccentricity as equivalent. Its leading spirits have set themselves up as the high priests of photographic art, and have arrogantly bidden us believe in their infallibility. In times gone by they have held up for admiration and speciously belauded productions of their vanity, which even they to-day would deem worthy of nothing but contempt. It has been the consistent policy of this Journal to denounce fearlessly the attempts that have been made to represent as the outcome of genius what are merely the results of ill-considered experiment, or, still worse, work which it is an outrage to exhibit on account of its intentional vulgarity or demoralising tendency. The present exhibition amply justifies the attitude we have taken. The notable absence of almost everything of the kind that has been the characteristic of past exhibitions amounts practically to a confession of error. There is a distinct improvement in the spirit as well as in the quality of the work generally. It appears to be dawning upon the responsible parties that art and common sense are not incompatibilities, and that an exhibition may be successful without anything that is puzzling or revolting. There is still too much pandering to the fashion of the day, which is, of course, transient; but this is probably deliberate, as the Salon appeals especially to a section of the community which is particularly susceptible to the influence of fashion in art as in other matters.

The work is, on the whole, small in size. Of the 284 exhibits, less than forty have an area of one square foot. We are glad to say that we left the gallery without the usual impression that the bulk of the exhibitors existed in a world full of gloom and misery. Possibly, on the other hand, there is a tendency towards frivolity, but the change is certainly for the better. It is gratifying to find that the dainty and graceful methods which we have been accustomed to associate with the names of Demachy, Puyo, and a few others, have had so wide an influence. Some of the most pleasing work would be practically impossible with a less plastic printing process than gum bichromate, and it is evident that this process, its possibilities and limitations, are becoming much more generally understood. Dr. Henneberg is still the leading exponent of the process on a bold scale. We have had opportunities of following his work through some of its experimental stages, and have the opportunity of viewing his productions now that he has obtained mastery over his medium. To say that he has reached finality would be absurd, but it is quite evident that, in his hands, the process, in addition to those exclusively its own, lacks none of those qualities which the ordinary carbon process possesses. His work has been so directly associated with the development of the process that it has been difficult to regard it from the pictorial point of view solely. We are able to do so now, since the experimental nature is no longer obvious. The four examples are certainly the most striking pictures in the exhibition. Their wonderful strength would make them noticeable anywhere, but, together with strength, they possess qualities which are just those which the majority of photographers who attempt landscape work on a large scale fail to obtain. The three portraits by Craig Annan can be placed in quite a different class. They owe nothing to modern photographic facilities or modern ideas, and our admiration of the genius of the author is not diminished on account of the fact that he has produced such magnificent examples of portraiture without adopting any but the most ordinary and best-known photographic methods. William Crooke is represented by two portraits in his usual style, and Ralph Robinson has a portrait of a lady which is very tenderly treated. Fred Hollyer we do not consider quite at his best. His work is bold, as usual, but he has not been so fortunate in his subjects. F. H. Evans' portrait of G. Bernard Shaw is singularly unhappy.

One of the most notable among the figure studies is catalogued as "A.A.—Studie im Freien," by Dr. F. Victor Spitzer. It represents a man carrying a rock up a mountain side. The figure is nude, and the treatment quite unlike anything in photography that has come under our notice.

Among the landscape work that of Alex. Keighley shows a remarkable advance, but that of Chas. Moss hardly fulfils his promise. He seems to have settled down to one idea, and one, at least, of his works

will not add to his reputation. A. Horsley Hinton also would have benefited by the exclusion of one at least of his pictures. Charles Job is fully up to his usual standard of excellence.

Both Demachy and Puyo are amongst the largest contributors as regards numbers of frames, and, needless to say, their work materially adds to the attraction of the exhibition. American photographers are also largely represented, but there is a notable absence of the freak photography which was such a feature of the recent American Exhibition at Russell-square.

It may interest some to learn that of the 284 pictures exhibited 138 are from Great Britain, 52 from the Continent, and 94 from America. As more than one-half were of foreign source, the exhibition can therefore hardly be considered representative of British photography.

PHOTOGRAPHIC SALON AT BRUSSELS.

(By Our Own Correspondent.)

Brussels has its Salon, which has just opened its doors for its very first exhibition. This show has been organized by the Cercle Artistique et Littéraire, in one of the rooms of their club, which is situated in the Park—one of the pleasantest places in this beautiful city. There is no charge for admission, that is, no direct charge, but the catalogue costs one franc, and as no titles appear on the frames, and the meaning of many of them is somewhat obscure, the booklet is a prime necessity to the visitor.

The room in which the pictures are hung is about the size of the Dudley Gallery, London. There is, however, no attempt at "greenery-yallery" hangings, nor are there any of those weird devices which bring delight to the young man of culture. A few pardonable eccentricities adorn the catalogue, but this was only to be expected, for one franc could not, with any conscience, be charged for a list of 200 pictures unless there was some kind of compensating make-weight. Therefore the shape of the catalogue is carefully devised, so that it cannot conveniently go into an ordinary pocket, or a book-case, nor would it be eligible for postage. Moreover, its cover is a chequered shirting of mauve hue, which appears to be dear to the heart of Brussels, for it is seen here, there, and everywhere, and the title-page is printed in bright green ink. The little brochure contains half-a-dozen poorly executed process blocks, and as many advertisements. Its compiler may be presumed to have been at loggerheads with the Hanging Committee, for there is no note of harmony between the work of the two, the items in the catalogue being numbered consecutively, while the pictures on the walls are hung in an altogether haphazard and aggravating manner. For example, picture No. 4 is sandwiched between Nos. 67 and 104. It is whispered that this arrangement has been purposely devised in order to promote rapid turning over of the leaves of the catalogue, so that a thriftless visitor may be induced to purchase another copy as soon as the first is worn out. This method of hanging has, however, the merit of allowing the visitor to begin his review of the pictures at any point without reference to No. 1. The only thing your correspondent could do was to fancy himself in the Dudley Gallery, Piccadilly, and to take the picture on the right-hand side of the door as his starting point. It ought to have been No. 1, but was in reality No. 46.

But it turned out, after all, that there was some sense of decorum in the hanger of the pictures, for he soon discovered that the pictures numbered 43—49 were the work of one man, R. Dürkoop, of Hamburg. Of these the best is 45, a very good portrait study. Praise must also be given to two other portraits, by the same hand, of pastors with Elizabethan frills round their reverend necks. There is also a curious church scene, with the air of genuineness about it, with a pastor, adorned with the afore-mentioned frill, reading from a lectern to an attentive auditory. From these pictures "in the roaring forties" we jump to the next one on the walls, No. 172, which the catalogue tells us is a Flemish interior by Joseph Piret, of Brussels. It does not call for any particular criticism. Another native photographer, C. Dewit, contributes 12 pictures, the best of which is the study of an old granny reading her Bible. Nos. 194—198 are the next works on the walls, and with a savage wrench at the leaves of the catalogue we discover that they are by A. Verbeck, of Antwerp. These are the first landscape studies which we have come to as yet, and they raise doubts as to the means adopted by the photographer to produce such prints from normal negatives. They may have been purposely over-printed, or exposed for the usual time to the action of light, and the prints afterwards mellowed by a vigorous application of a blacking brush. We cannot, of course, say which of these two courses has been followed, but we feel, as we have felt before, what an interesting compilation it would make if the new school of photographers were compelled, when exhibiting a picture, to give a real, true, and exact description of the manner of its birth and after treatment.

No. 166 presents us with an avenue of trees standing up darkly from a carpet of snow, and the catalogue tells us that it is the work of F. Leys. There are brilliant patches of sunlight on the snow, but, strange to say, there are none of the adjacent tree-trunks; indeed, their darker sides are towards the direction of the sun, for they gain on their other edges a certain amount of reflected light from the snow. We regretfully came to the conclusion that those high lights are due to the use of the scraper, or to Chinese white. The frame bears the word "Vendu," and if it applies to the purchaser it is distinctly the use of the right word in the right place. And so we pass on from picture to picture, good, bad, and mediocre, until attention is arrested by one which bears the title of "Christ Mort," by L. Bovier, and another by the same hand, "Christ au Tombeau." That these pictures have a certain cleverness about them must be at once admitted, but they are gruesome and repulsive, and not suitable subjects for the camera. Besides, there are many examples of similar religious subjects in Brussels by the master hand of one Rubens and others, and by comparison the photographs suffer terribly. The same photographer shows by pictures of quite another character that he is a good worker, and has therefore no need to attract attention by soaring too high. "Evening on the Sandhills" (No. 28), by W. J. Croall, is one of the best landscapes in the room, and we are glad to award honourable mention to one from our own North Countree.

A reminiscence of last year's Salon at the Dudley Gallery comes to us now and then as we review these pictures at Brussels. For example, M. Puyo shows here the same pictures which were hung in London, and E. Steichen shows the same eccentric, and eccentrically framed productions, with the self-same rough sketch of a thermometer, or whatever else it may be, which stands for his sign manual on his capacious mounts. C. Fondu, who contributes six pictures to the exhibition, would do more justice to his work if he did not print them in a disagreeable blue-purple tone. It is difficult to get at the meaning of his (147) "Jeunesse." At the back of the picture is a big sun with conventional rays, against which comes the profile of a young woman unclothed save for a big bunch of flowers which she hugs to her breast. The gum-bichromate process is worthily represented by R. Demachy with some of his charming decorative panels, and a view of Paris in winter, which wells repays examination. Why, oh! why cannot, or will not this clever worker in gum confer upon some of his disciples the secret of his method of working? Can it be that he has no secret to divulge, and that it is the artistic sense that is wanting in his followers?

There are one or two nude studies here of the usual unsatisfactory description. One, perhaps, a little too nude for our insular tastes, but Brussels is not so nice in these matters, and a municipality which boasts a certain public fountain, which every one comes to see, would hardly object to a photographic life study.

There are here four very fine examples of photogravure portraits by E. Fabronius, of Brussels; indeed we may regard these as being the finest works in the room, from a technical point of view. As in all other photographic collections, there are here good and bad works cheek by jowl with one another, some which it would be pleasant to possess, and others which it would be quite impossible to live with. There is the same familiar, but incomprehensible, endeavour to make the products of the camera appear to be what they are not. One or two workers have apparently rubbed their ideas into rough paper with black chalk, and have then mellowed the work by giving it to a coal-heaver for a few months' sojourn in his grimy pockets. But when all is said and done, the first exhibition of the Brussels Salon is not half so far "advanced" generally as were some of the pictures hung in the memorable first exhibition of the Dudley Gallery Salon. As time goes on the grosser eccentricities will be eliminated, as they have been in London. We wish our confrères in Belgium every success in drawing the public to this, their first Salon.

THE PHOTOGRAPHIC CLUB.

Trustees: Messrs. Frank Haes and F. A. Bridge.

Committee: Messrs. G. E. Brown, E. W. Foxlee, J. W. Mason, W. R. Stretton, H. P. Smith, G. W. Tottem, H. Snowden Ward, Chas. Wallis.

Librarian and Curator: Mr. Hans Müller.

Recorder: Mr. A. W. Bartlett.

Hon. Sec. and Treas.: E. A. Newell, 4, Maiden-lane, Queen-street, E.C.

The following circular has been issued to members:—The Photographic Club was founded in 1879, for the purpose of enabling its members to discuss photography in an informal and social manner, and celebrated its "coming of age" in December last. Since the formation of the Club, scarcely a process or modification of a process has been allowed to pass without being discussed in that sociable and pleasant manner which has always characterised its proceedings; conducted, as they are, in a way to be interesting both to the elementary and advanced students of photography. The Club possesses one of the finest photographic libraries in existence; has a large quantity of useful apparatus; a choice collection of interesting objects, illustrative of the photographic methods of the past; and is in a good position financially. Its meetings are held at Anderton's Hotel, Fleet-street, every Wednesday evening, at eight o'clock. Appended will be found

the programme for the first half of the winter session. Visitors are always welcome, and the Hon. Secretary will, on application, be pleased to forward invitation cards for any of the meetings:—

October 2, 1901.—Mr. George E. Brown, "Warm Tones in Lantern Slides."
October 9.—Open Night and Exhibition Matters.
October 16.—Rev. John M. Bacon, M.A., F.R.S., "By Land and Sky—the record of a Balloonist."
October 23.—Mr. Chas. Wallis, "Photographing Polished Metallic Surfaces."
October 30.—Mr. F. A. Bridge, "The Convention at Oxford," with slides.
November 6.—Annual General Meeting.
November 13.—Mr. T. W. Derrington, "Stereoscopic Photography."
November 20.—Open Night.
November 27.—Mr. L. Medland, "Through Boer Land in a Bullock Waggon."
December 4.—Mr. H. Snowden Ward, "Photography for the Press."
December 11.—Mr. T. Thorne Baker, "The Transitional Elements in Photography."
December 18.—Mr. G. T. Harris, "Some applications of Light Filters in Landscape Photography."

News and Notes.

Photographic Club, Anderton's Hotel, first meeting of the winter session, Wednesday, October 2, at 8, Mr. George E. Brown will read a paper, "Warm Tones in Lantern Slides." Visitors are welcome.

Mr. W. F. Slater informs us that a dark room has been fitted up for the use of photographers at the Hotel Victoriaberg, Remagen, the headquarters of the South London Photographic Society on their Rhine excursions.

We read in the daily press that the Governor of Gibraltar (Sir G. White) has issued an ordinance forbidding all photographing or sketching of the batteries and fortifications of Gibraltar. We were under the impression that photographing of the fortifications of Gibraltar had always been prohibited, or at least for a long time past.

Photograph of a Volcano.—By the kindness of our friend and predecessor, Mr. James Alexander Forrest, of Liverpool (from whom we are very pleased to hear), we have received a photograph of Asasan, a volcano in Japan, over eight thousand feet above sea level. The picture shows the volcano active, volumes of dense black smoke casting up into the air. These clouds are often laden with small dust, which falls like rain. This interesting photograph, which gives a fine representation of the eruption, was taken by Mr. Forrest's son, who resides in Tokio, Japan.

Under the title of "Bell's Miniature Series of Painters," Messrs. Bell are about to bring out a new illustrated series of shilling monographs, designed mainly to help those who wish to take an intelligent interest in the works of the great painters, without going deeply into the study of art. Each volume will contain a short life of the artist, an informal essay on his art, a special chapter on the works illustrated, and a list of his chief pictures. The first volumes deal with "Velasquez," "Burne-Jones," "Fra Angelico," "Watteau and his Pupils," "Watts," and "Romney." The first two will be ready this month.

Cripplegate Institute.—A course of eleven practical lessons in photography will commence on Friday, October 4, at 7.15 p.m., under the direction of Mr. C. W. Coe, suitable for those commencing photography; also a special advanced class, under the care of Mr. John H. Gear, F.R.P.S., commencing Tuesday, October 1, at 8 pm., specially suitable for those intending to sit for the City and Guilds examination. The Governors of the Institute are offering medals to the most successful students in the above classes. Further particulars and syllabus can be obtained on application to the Manager, Cripplegate Institute, Golden-lane, E.C.

At the Birkbeck Literary and Scientific Institution, London, a course of about thirty lectures on practical and theoretical photography will be given by Mr. E. Senior (Honours Medallist and Prizeman, City and Guilds Institute; first-class Honours in Chemistry), on Friday evenings, at 7.30, commencing October 4. This course will be arranged, as far as possible, to suit the requirements of both amateur and professional students, and will cover the syllabus of the City and Guilds of London Institute, at which examination in May next students will be expected to sit if required. On the result of these examinations, certificates and prizes are awarded.

Aluminium.—Photographers are now pretty familiar with the uses to which aluminium is put in the manufacture of photographic apparatus—lens mounts, camera fittings, and the like. At the meeting of the Mechanical Section of the British Association last week, Professor E. Wilson spoke of the present commercial importance of this metal, mentioning that in 1900 no less than five thousand tons of aluminium were produced by plant having a combined output of about twenty-five thousand horse-power, and representing a capital of over two million pounds. To fully realise what 5000 tons of aluminium means, one must take into account the extreme lightness of the metal, it being but about a third of the weight of iron. It was but, comparatively, a few years ago that aluminium was looked upon very much in the light of a laboratory curiosity.

An Assistant wanted for Boston, U.S.A. — An American Reader, Mr. A. Marshall, of 16, Arlington-street, Boston, U.S.A., writes:—"I think I can fairly claim to be one of your oldest subscribers, as I commenced to take the Journal in the early seventies, and receive it regularly every week now. I consider it the very best photographic journal or magazine published, and it should be in the hands of every man who takes pride and interest in the business of photography. It seems to me that your list of subscribers on this side of the water should be very large. I had the pleasure of a slight acquaintance with the late J. Traill Taylor, having met him in London in 1872, and later, when he was staying in Boston for a short time. I am in need of an assistant about October 1st, and have thought possibly that some young Englishman would like to come over to try his luck. Good men are hard to obtain here · most of them who are (or think they are) good men either go into business for themselves or demand such salaries as assistants that employers cannot afford to pay."

A new Use for Telephotography.—At the recent meeting of the British Association, Mr. H. Yule Oldham read a paper on the experimental demonstration of the curvature of the earth's surface. He said that in 1870 Dr. A. R. Wallace performed his well-known Bedford Level experiment. In the summers of 1900 and 1901 a series of similar experiments was made with the special object of obtaining photographic records of the same. The six-mile stretch of the old Bedford river between Welney and Denver was selected, as it was perfectly straight, had a bridge at each end, but none in between. The height of the parapet of Welney Bridge above the water-level was measured, a mark was set up on Denver Bridge at the same height above the water-level, and midway—three miles from each end—a mark was set up on a pole at the same height above the water-level. A telescope was then directed from the parapet of Welney Bridge to the mark on Denver Bridge, and the middle mark was seen to stand up about six feet above the line of sight, agreeing with the effect calculated to be produced by the curvature of the earth's surface. By the aid of telephotography Mr. Oldham was enabled to obtain photographs of these effects, which were shown on the screen

Devonport Camera Club.—At the tenth annual meeting of the Devonport Camera Club (Dr. E. S. Saunders presiding), Mr. G. H. Cripps (Honorary Secretary) reported that during the year fourteen meetings had been held, and the Club were indebted to Dr. Saunders, Messrs. A. Crook, W. H. Lethbridge, J. T. Trend, G. Trend, J. F. Coombes, H. S. Hill, Dart, H. J. Hissett, and J. A. Boolds for lectures and demonstrations, they having been of a highly successful character. Six new members had been elected. It was thought advisable to postpone the exhibition owing to the unfavourable weather at the end of last and beginning of this year. The summer outings had been of an interesting character. Mr. W. G. Parkman (Hon. Treasurer) reported that the membership had decreased from 54 to 45. They started the year with an adverse balance of £3 4s. 2d., and were now only 3s. 10d. in debt. Mr. H. J. Hissett, of Plymouth, was elected President, and the other officers elected were Messrs. J. T. Trend, C. Dart, W. H. Lethbridge, and W. G. Parkman, Vice-Presidents; Mr. F. B. Langdon, Hon. Secretary; Mr. A. J. Catford, Hon. Treasurer; and Messrs. G. H. Cripps, W. H. Mayne, R. Maw, and R. O. Jolliffe, Committee.

The Heraldry of Science.—Mr. A. Montefiore Brice writes to the "Times":—"Now that the more serious work of the British Association is over, it may perhaps interest your readers if I draw attention to some curious examples of science adapted to heraldry. I derive them from the banners and bannerets which have been hanging up in the reception room of the British Association at Glasgow during the past week. The banner, for example, of Sir William Huggins, who was President at the Cardiff meeting, 1891, shows the solar spectrum for a crest and the constellation of Orion for a coat of arms. That of Sir William Crookes presents a radiometer and three prisms, together with the quaint motto 'Ubi crux ibi lux.' Herschel was President at the meeting at Cambridge so long ago as 1845, and on his arms there appropriately appear the sun in the chief and a telescope in the base. Sir William Turner, who presided last year at Bradford, bears as a charge a wheel; Siemens blazons what is apparently a beetroot—he was interested, I believe, in sugar produced from that source, and Sir Roderick Murchison, who was President at Southampton so long ago as 1848, a pecten shell—suitably enough for so great a geologist. Sir William Flower's banner shows a coat bearing a cinquefoil and the punning motto 'Et flores et fruches.' Lord Lister Liverpool, 1895) blazons the staff and serpent of Æsculapius; Dawson, who presided at Birmingham in 1886, has three daws on his coat; and Sir George Airy (Ipswich, 1851), Sir Henry Roscoe (Manchester), and Sir Michael Foster (Dover) display the arms of those towns, and, presumably, did not possess personal arms."

Glass for Scientific Purposes.—At the British Association a discussion on glass used for scientific purposes was opened by a paper from Dr. Glazebrook, the superintendent of the new National Physical Laboratory. Dr. Glazebrook said that he hoped some present possessed of a greater technical knowledge than he had would discuss the making of glass, the determination of the properties it should possess, and the calculation of the best form of lenses for various purposes. But he would state some of the difficulties which had been overcome during the past twenty-five years and indicate the lines along which we might hope for progress. The theory of an ordinary achromatic object-glass was well known. In consequence of the fact that in a prismatic spectrum the ratio of the dispersion of the extreme rays to the deviation of the mean ray was different for different materials, it was possible to construct two prisms so as to produce a resulting deviation, but not separation of two given rays. The image formed when the two extreme rays were combined was not white, but exhibited prismatic colour. If an ordinary lens of

crown and flint glass were achromatised for the rays C and F, then, for the flint glass, the dispersion of the blue end was greater than that of the red end, less for the crown. A more completely achromatic result would be obtained by using two glasses, for which for given equal total dispersion the distribution of the rays in the two spectra was more nearly the same. We needed to shorten the blue end or lengthen the red end of the flint glass spectrum or to treat that of the crown glass in the reverse way. Stokes and Harcourt and others who had worked at this problem were led to the result that salts of boron lengthened the red end of the spectrum and salts of titanium lengthened the blue end. Further experiment had shown that the effect supposed to be due to the titanium really in all probability arose from the presence of phosphates. With the view of investigating the effect of various substances on the refractive and dispersive powers of glass, Abbe began his work at Jena about 1882, and for special reasons it was possible to carry on the work on a large scale. Results of importance were speedily obtained. The discovery was confirmed that boron lengthened the red end of the spectrum, and the addition of fluorine, potash, and soda was shown to act in the other direction. The effect of lithium, calcium, and aluminium was also investigated. The effect of soda was small, while potash, unless used only to a slight extent, made the glass hygroscopic. Fluorine was by far the most effective, but it was not possible to use retorts containing silica in the manufacture of the glass. Among the glasses manufactured at Jena it was possible to find various pairs which could be combined into better achromatic lenses than the old crown and flint. It was necessary for this purpose that the ratio of the total dispersion to the refractive index should be different for the two glasses, but that the ratio of the partial dispersion to the total should be the same. Dr. Glazebrook then showed how three colours might be combined in the image instead of two, as in the older manufacture. In such an object-glass the advantages were numerous. It was more nearly white than that formed by a lens of two ordinary glasses, and as a consequence would stand a higher magnification in the eye-piece. As a result the whole instrument might be made more powerful, or, for the same resultant magnifying power, we might use a less powerful object-glass, and thus secure other advantages in illumination. There would be with such a lens some outstanding chromatic aberration, the violet image being rather greater than the red. This was corrected in the eye-piece itself. Attempts had been made either to use fluor-spar in the object-glasses, or to make glass containing fluorine. With such a glass it would be possible to obtain almost perfect conditions. Dr. Glazebrook finally considered the problem offered in the case of photographic lenses.

Commercial & Legal Intelligence.

We hear of the return from the United States of Mr. E. L. White, chairman of the Lumière N.A. Company, of 78, Queen Victoria-street, E.C. We understand that an ideal site has been secured, and that arrangements are being rapidly pushed forward for the erection of factories for the manufacture of the Lumière products in the United States.

We have received from the Standard Enlarging Company (late John Valentine), Grosvenor-road, Twickenham, London, S.W., a trade price list of bromide, carbon, and platinotype enlargements on paper, opal, and canvas. The company undertakes mounting in all styles, finishing in monochrome, painting in oil and water colour, ivory miniatures, enlarged negatives, retouching, printing by all processes, lantern slides, toned bromide and nikko enlargements for professional photographers, artists, and photographic material dealers only.

The Columbia Optical and Camera Company, of 42, Goswell-road, E.C., write:—"We should be obliged if you would mention that we have decided to extend the time for sending in competing prints in our prize competition from October 15 to November 15, 1901. We are forced to take this step, as the demand for self-toning and metalotype papers has been so unexpectedly large that we were unable to supply, and we have only just now received fresh stocks. The Columbia gaslight paper also, instead of having it ready on September 1, as we expected, will not be ready before October 1."

American versus British Manufacturers.—In the course of an address to the Mechanical Section of the British Association, Colonel R. E. Crompton pointed out that "the chief difference between the manufacturer of America and the manufacturer at home is that, whether it be steam engines, tools, agricultural machinery, or electrical machinery, the American invariably manufactures goods in large quantities to standard patterns, whereas we rarely do so here, at any rate to the same extent. Where we turn out articles by the dozen the American turns them out by the hundred. This difference in the extent to which an article is reduplicated is caused by the Americans having realised to a far greater extent than we have the advantage of standardisation of types of machinery. They have felt this so strongly that we find in America that work is far more specialised than it is here, so that a manufacturer, as a rule, provides himself with a complete outfit of machinery to turn out large numbers of one article. He lavishes his expenditure on special machinery to produce every part sufficiently accurate to dimension to secure thorough interchangeability: consequently the cost of erecting or assembling the parts is far less than it is here. One reason why the American manufacturer has been able to impose on his purchasing public his own standard types, whereas we have not been able to do so, is that very rarely in America does a consulting engineer come between the manufacturer and the user, whereas here it is the fashion for the majority of purchasers of machinery to engage a consulting engineer to specify and inspect any machinery of importance. By this I do not impute any blame to our consulting engineer; he considers the requirements of his client, and insists that they are to be adhered to as closely as possible; to him the facility of the production of articles in large quantities is of no moment. In America it seems to be understood by the purchaser that it is a distinct advantage to every one concerned, both manufacturer and purchaser, that the purchaser should to some extent give way and modify his requirements so as to conform with the standard patterns turned out by the manufacturer. Although manufacturers all hope for this simplification of patterns, yet, for the reasons I have given, it will be some time before their hope is realised. But on other matters it is quite possible for manufacturers to combine, so as to obtain some standardisation of parts which they manufacture which will reduce costs and be of advantage to every one concerned. Many years ago Sir Joseph Whitworth impressed on the world the importance in mechanical engineering of extreme accuracy, and of securing the accurate fit and interchangeability of parts by standard gauges. But in spite of his idea being so widely known and taught, how seldom it has been acted upon to the extent that it should be. We pride ourselves on having all our screws made of Whitworth standard, and yet how many of the standard bolts and nuts made by different makers fit one another? I myself have sat on a Committee of this Association which was called together twenty years ago, with Sir Joseph Whitworth as a member of it, to fix on a screw gauge which would be a satisfactory continuation of the Whitworth screw gauge down to the smallest size of screw used by watchmakers. It has taken all these years to carry out the logical outcome of Sir Joseph Whitworth's original idea, viz., the providing of standards to be deposited in care of a public authority to act as standard gauges of reference. The complete interchangeability of parts which I have above referred to, and which is so desirable in modern machinery, can, of course, be obtained within the limits of one works by that works providing and maintaining its own standards to a sufficient degree of accuracy. But if the articles be such as watches or bicycles, motor cars, etc., it is very desirable that all parts liable to require replacement should be made by all manufacturers to one standard of size, and, in order that the gauges required for this purpose should all be exact copies of one another, it is necessary that they should be referable to gauges deposited either with the Board of Trade or with some body specially fitted to verify them and maintain their accuracy."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
30.....	Royal Photographic Society ...	Exhibition opens to the public.
October. 2.....	Croydon Camera Club	*Photography of the Moment*; and Demonstration: *Photographic Post Cards*. Hector Maclean, F.R.P.S.
3.....	Hull	Ordinary Meeting.
3.....	Liverpool Amateur	Demonstration: *How to improve Faulty Negatives*. Fred Anyon.
3.....	London and Provincial	Lantern Lecture: *Venice*. A. L. Henderson. Ladies' Night.
5.....	Borough Polytechnic	Excursion: Wimbledon Common. Leader, E. W. Burch.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 19,—Mr. R. Beckett in the chair.

Mr. A. Mackie said it would be remembered that some weeks ago Mr. A. L. Henderson stated that, although he developed certain lantern plates through to the back, he could not get sufficient density.

Mr. T. K. Grant thereupon remarked that it had been asserted that it was impossible to develop a plate right through to the back, and some difference of opinion was manifested.

Mr. Mackie had never asserted that this was the case, but that one could not develop a negative or positive through to the back, at the same time keeping the proper gradatic

Mr. Henderson, later, brought up some plates he had experimented with, saying that he did not expect they would convince the speaker; nor did they.

Mr. Mackie suggested that the negatives should be treated with a mixture of bichromate of potash and sulphuric acid. The acid, in cold weak solution, did not attack the silver, but, mixed with bichromate, formed sulphate of silver, which was soluble in water. If, then, one treated a pure silver image in this way one should have a clear gelatine film left, but in practice there were several reasons that might prevent the gelatine from being quite clear. The acid might be contaminated with hydrochloric acid, in which case the silver would be converted into chloride of silver, and thereby increase the haloid salt in the plate. Further, the image might not consist of silver alone, but partly of an organic deposit, as in pyro negatives.

Mr. Mackie said he had experimented with the plates given him by Mr. Henderson, and also with some old negatives of his own. He

passed round the results of these trials: an ordinary transparency dipped partly into the mixture already referred to, in which practically the whole of the image in that part was removed; another showing as clear glass; a broken pyro negative in which only the coloured organic image was left. He also tried a number of old sensitometer plates, three or four of them of very full density. In these cases the results were curious. Traces of image were to be seen on two, but on another there was a decided red stain where the deposit originally occurred. Presumably the red colour could not have existed in the original negative, because the deposit was pure black. If the red had been there the image would have been warm in tone. He thought it probable that, whatever the organic deposit might be, it had been acted upon by the acid or bichromate, or both, in conjunction, and its colour heightened. Turning to Mr. Henderson's plates, the first was treated with the mixture, and there was apparently no organic deposit. What remained after the removal of the metallic silver was the haloid salt of silver, and it would be seen that but a very small proportion of the silver salt could have been reduced. In the next case there was apparently a trace of organic deposit. The plate was treated with the mixture, and then, to determine what actually remained, the plate was dipped in hypo, completely removing the silver salt, and leaving a slight stain of organic deposit. The third plate showed a distinct organic image like the red sensitometer plate, the colour being distinctly heightened by treatment in the acid and bichromate bath. The plate, after further treatment with hypo to remove the haloid salts, showed an organic image. One could see how much organic image and how much haloid salt remained at a glance. The experiments conclusively proved that, even if it be possible to develop a plate through to the back so that no haloid salt remain, Mr. Henderson had signally failed to do so in the plates he had shown.

Mr. Thos. K. Grant said that he was somewhat concerned with the matter under discussion, in that he asked whether it were possible to develop a plate through to the back? He had dealt with the plates given him by Mr. Henderson in this way. He took a very black and white underexposed negative, and through it exposed one of the lantern plates for what he considered a long time, developing it afterwards in a normal developer for twenty minutes. Apparently he had developed to the back—there was as much image in the back as on the front, to all appearances—but after washing and reducing with cerium the apparently black plate became white all over. The point brought forward was that one did not, by development, reduce the whole of the silver from front to back, however one proceeded. He increased the exposure fifty per cent. for the second plate, and developed for half an hour. After washing and reducing, although more of the silver salt had been used, there was a distinct and appreciable quantity of unaltered haloid in the film. He then took a Sandell film, exposed it for three-quarters of an hour at f-8, and developed. The developer acted on both sides for forty minutes. After treatment similar to the others he got a film that he passed round, showing still some unaltered silver salt. The only deduction he made was that when one developed there were two alterations of the silver salt—part that was amenable to the further action of the developer, and part that was not affected by a developer.

Mr. P. Everitt said that this deduction somewhat agreed with Kogelmann's theory advanced some years ago. He said that the action of the developer was to reduce the outer portions of the silver nuclei, leaving the inner parts unaffected. Therefore when a plate was treated with a silver solvent there was still the silver nucleus left.

A member showed that Hurter and Driffield five or six years ago pointed out in one of their papers that they had done their utmost to develop the entire thickness of a film, but that with all ordinary plates it was quite impossible to do so.

Leeds Photographic Society.—This old-established Society has just issued to the members the syllabus of meetings for the season 1901-2, which contains a capital list of lectures, and which should draw good audiences to the headquarters at the Philosophical Hall, Park-row. Commencing on October 8, Mr. J. W. Addyman opens the winter session with "A Few Manx Photographs." On October 22 Mr. James Stirling (President of the Geological Society of Australia) will lecture on "The Australian Alps." Mr. Charles B. Howdill, A.R.I.B.A., is down for "The Photography of Colour" on November 12, and Mr. Philip Elliff with "Ceramic Photography" on November 26. On December 10 Mr. Percy Lund is to give "The Story of a Streamlet," and the half-session closes on December 24 with an exhibition of Yorkshire Photographic Union lantern slides. The new year opens on January 28 with Mr. Child Bayley on "Photographic Heresies," following which, on February 11, is the annual exhibition of members' work and conversazione. On February 25 Mr. A. Horsley Hinton will lecture on "Finding and Focussing, some practical hints in pictorial work." On March 25 Mr. Godfrey Bingley will talk of "Oxfordshire, Warwickshire, and the English Lakes, &c." On April 9 Mr. Percy Sheard is down with "Cairo to the First Cataract." and the concluding meeting of the session is by Mr. B. A. Burrell, F.I.C., on "Chemicals used in Photography." We wish the society a most prosperous session.

Plymouth Photographic Society.—The annual meeting of the Society was held at the headquarters, the Athenæum, George-street, on Friday evening, September 20. Mr. J. Davy Turney, the President, in the chair. Motions to alter the rules so as to reduce the Committee from eight to four, to hold the annual meeting in May, and to leave the decision of holding an exhibition to the annual meeting each year were defeated. The Hon. Secretary (Mr. Wilfred Grist) reported that at the beginning of the year the membership was sixty-two, and at the close eighty-eight. For the winter and spring sessions fifteen meetings were arranged, and all were well attended, the lantern evenings especially; for nine of the summer gatherings there was very fine weather, and the President's and the Vice-President's outings were much appreciated. The adverse balance of 3*l.* 19*s.* 10*d.* had been replaced with a credit balance of 3*l.* 19*s.* 11*d.* Since the accounts were closed, overdue subscriptions had increased the total balance to 5*l.* 7*s.* 5*d.* All the liabilities of the year had been met. The President, in moving the adoption of the report, paid a tribute to the ungrudging and unassuming work of the Hon. Secretary. The success of the session, with its very interesting demonstrations and lectures, was largely due to him. The report having been adopted, the President thanked the Society, and especially the Committee, for the hearty support accorded him during his year of office. He nominated as his successor in the office of President for the ensuing year, Mr. C. H. Dymond. Mr. Treleaven heartily seconded, and the election was by acclamation. Mr. Dymond, accepting the honour, appealed for the support of the members in making the Society one of the best and strongest in England. It was established in the midst of some of the most beautiful and varied scenery to be found in the country, and it should avail itself to the full of its opportunities, and especially to encourage young members. Messrs. F. Johnson and W. H. Mayne were elected Vice-Presidents; and Messrs. W. H. Harris, A. W. Hicks, W. Chas. Johns, Geo. Johnson, H. Pearse, M.D., J. Davy Turney, E. G. Turney, and A. Wiblin were elected by ballot as the Committee. By acclamation and with hearty thanks for their services, Mr. Wilfred Grist and Mr. J. Trouren Trend were re-elected Hon. Secretary and Hon. Treasurer respectively. Mr. H. S. Hill and Mr. G. F. Treleaven were elected as delegates to the Affiliation of Photographic Societies.

FORTHCOMING EXHIBITIONS.

1901.

Sept. 27–Nov. 2 ..... Photographic Salon, Dudley Gallery, Egyptian Hall, London, W. Hon. Secretary, Reginald W. Craigie, Dudley Gallery.

,, 30 ,, 2 ..... Royal Photographic Society, New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.

October 29–Nov. 2 ... Rotherham Photographic Society, Drill Hall, Rotherham. Hon. Secretary, H. C. Hemingway, Tooker-road, Rotherham.

November 6–8 ..... Hackney Photographic Society, Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.

,, 23–30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.

Dec. 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

,, 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart, 93, Norfolk-street, Glasgow.

Patent News.

The following applications for Patents were made between September 9 and September 14, 1901:—

Stereoscopic Adapter.—No. 17,992. "Improved Stereoscopic Adapter." Complete specification. Richard Henry Anthony.

Cinematograph.—No. 18,015. "An Improved Device for synchronously operating a Phonograph and a Cinematograph." (Communicated by La Société L. Gaumont et Compagnie, France.) Henry Harris Lake.

Developing Boxes.—No. 18,177. "Employment of Transparent Cameras and Developing Boxes not permitting the passage of Actinic Light." Fritz Dannert.

Roll Holders.—No. 18,278. "Improvements in Cameras and Roll Holders, and in Spools and Films therefor."—John Edward Thornton.

Print Cutters.—No. 18,317. "Cutter of Circular Photographic Prints." Ernest A. Madge.

Cinematography.—No. 18,324. "Improved Means of exhibiting Kinematographic Photographs." John Alfred Prestwich.

Camera Stand.—No. 18,408. "An Improved Camera Stand for Cycles." Joseph Sanders and W. T. Osborne.

Hand Cameras.—No. 18,415. "Improvements in and relating to Hand Cameras." Henry Conrad Heidl.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

MOUNTS IN THE AMERICAN STYLE.

To the Editors.

Gentlemen,—Our attention has been drawn on several occasions in the various photographic journals to the complaints on the part of

amateurs who do not care for the ordinary somewhat ornate style of photographic mount, and asking why the English manufacturers do not supply plain mounts in art colours, in the style used by the American amateurs. We have known of this feeling for some considerable time, and have brought out a series of mounts, in art colours, which we think meet these demands, and we enclose you, for your inspection and review, a few specimen mounts, which might interest you.

We might mention in passing that, as you are no doubt aware, we do not supply amateurs direct, we supply the trade only.—We are, yours, &c., CHAS. TYLER AND ENGLAND BROS., LTD.

79, Copenhagen-street, King's Cross, September 18.

[The specimen mounts sent are plain in style and pleasing in tint.—EDS. *B.J.P.*]

DRYING NEGATIVES.

To the EDITORS.

GENTLEMEN,—I see by your issue of September 13 that some discussion took place at the Photographic Club with reference to the advisability of drying negatives by the application of blotting-paper, a duster, or other similar means. For some time past, I have dried all my negatives by wiping them gently with a Turkish towel, and find the procedure perfectly safe and an advantage rather than otherwise. I grasp a mass of the towel in the hand, making it into a sort of pad, and draw it lightly several times across the face of the negative, until the superficial moisture has all been removed. This has the effect of removing chance particles of grit, hairs, etc., that often adhere to the negative; it ensures even drying, while with such treatment the negative is usually ready for printing in an hour's time.—I am, yours, &c.,

Dunmail Cottage, Grasmere, September 19. PERCY LUND.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—I trust that because certain firms—not photographers—have meantime withdrawn objectionable advertisements injurious to photography as a profession, professional photographers, with their wonted carelessness of their rights, will not on that account be lulled into a sense of security, and withdraw from giving their active support to the movement that has for one of its aims the only perfect security the photographers will ever get against unscrupulous pirating, and that is by combination to obtain an amendment of the law of copyright, applying to photographic portraiture, giving photographers the copyright of all negatives taken by them.

Perhaps a mistake has been made by some of the profession in suggesting, among other reforms, the advisability of dispensing with the photographic dealer, and getting up co-operative and other concerns, or buying direct from the manufacturers, etc. I think that in many ways we are obliged to the bonâ-fide dealer, whose interest it is to keep us right with the manufacturer, to keep us in touch with the progress of our art, and also, because of his extensive connection and travels, to sometimes become our guide, philosopher, and friend.

In the formation of the Professional Photographers' Association the legitimate dealers ought to be asked to co-operate with us as honorary members. They are continually on the road, and their ready wit and quick eye would be always on the alert for the too many ways in which the photographic profession can be injured. The real parasites of our profession are a certain class of chemists, opticians, and others who, in addition to dealing, are willing to do professional work—printing, enlarging, and developing for amateurs or anybody, and, because they do not do so openly, are still able to buy their material from the manufacturer.

They are thus, to all intents, professional photographers; but by being so on the quiet, they obtain their material in a better market than is possible for the legitimate professional. They are also able to obtain the work mentioned because the regular professional is practically debarred from selling amateur outfits and material, and it is easy for the vendor of such to recommend himself as the most suitable person to undertake any work the amateur may be disposed to give to others.

This is a real and pressing evil, and one that could be dealt with by an influential body, and by that only.

Then there is the evil of the cheap bromide enlarger; also of the enormous business done in cheap copying of good work. This is still done by bare-faced advertising in church magazines, etc. There is another evil that, I think, is very injurious to the reputation of photography as a profession. Certain well-known photographers are sending operators to various parts of the country, and, by the aid of well-worded letters, soliciting sittings for various purposes.

The people selected for this attention are usually socially the best and wealthiest in the part of the country where the operations are being conducted, such as justices of the peace, magistrates, bankers, members of county councils, etc. If this were done in the district in which the photographer exercised his craft there could be little fault to find, but such is not the case, and in some cases the ground worked is hundreds of miles away.

There can be no doubt that hawking the country in this manner is a very questionable method of adding to business, and is certainly distinctly lowering to the photographic profession. There is just one consolation in this connection: most of the odium falls on the firms mentioned themselves, especially when proofs are delivered and charged for (of course, with the option of being returned).

I am aware, Mr. Editor, that a society, however strongly formed, cannot prevent the last grievance mentioned, but I believe a strongly represented body, such as the Professional Photographers' Association ought to be, would do much to mitigate that and other evils complained of, and generally have a decided elevating influence on the whole profession.—I am, yours &c., NORTHERN LIGHT.

STEREOSCOPIC TRANSPARENCIES.

To the EDITORS.

GENTLEMEN,—I am glad to see from your issue of September 13 that you are again intending to give your readers an article on stereoscopic photography. I think many people are afraid to take up this most interesting branch of photography by the idea that the difficulties are great; the negative having to be copied with the camera, or cut and transposed in order to print the transparency. Few people are adepts with a diamond, but this objection is entirely obviated now that cut films have been brought to such perfection, and the cutting of the negative can easily be done by any one with a knife. Many have not the opportunity of making the transparency in the camera, for which daylight is required, and perhaps therefore contact printing would be most generally used by the amateur. I have designed, and had made for me, a printing frame in which I think the trouble of printing from cut films is reduced to simplicity itself. In it I can print glass transparencies, bromide prints, or P.O.P. prints, and if it would be of any assistance to you I shall be very pleased to send it for your inspection. I have, of course, no intention of using it commercially, and my only reason for sending it is that it may perhaps help to remove the idea that the making of stereoscopic transparencies is in any way more difficult than lantern-slide making. I know that there are frames made in which you can print from glass plates, but I think mine is peculiarly adapted for printing from films.

I have used the frame for some years, and can personally vouch for its efficiency.—I am, yours, &c., S. F. R.

[The above is one of many communications relating to stereoscopic photography that have reached us in the last few days. We shall be pleased to examine the printing frame referred to by our correspondent.—EDS. *B.J.P.*]

LIGHTLESS PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Referring to your article on the above subject on September 13, there is nothing very new in zinc affecting plates. In one of my hand cameras I have zinc sheaths, and I find that if any of the black gets scraped off the backs of any of them the plates immediately behind develop markings to correspond, hence I have to be careful to keep them blackened. It requires a month or more to produce the markings.—I am, yours &c., LOUIS MELDON.

THE BACKING OF PLATES.

To the EDITORS.

GENTLEMEN,—Mr. A. Levy again insists emphatically that the appearances resembling halation, which have been under discussion, are of only comparatively recent occurrence, never having been noticed, as far as he knows, till about six years ago. This may very well be so, although perhaps it would not be unfair to suggest that such phenomena may have been present before, even if unnoticed. Mr. Levy cannot comprehend why such results occur only on certain occasions. It can readily be answered that all the predisposing causes of these phenomena are not in every case present. He also remarks that sometimes a halo may be noticed round a dark object against the light, and yet not appear on the plate. This seeming contradiction may perhaps be explained by the fact that such halos are often lost in the surrounding dense portions of the negative to such an extent that they do not show except with prolonged printing.

Mr. Levy can easily satisfy himself as to the naturalness or otherwise of these appearances if, in photographing some of the subjects in which he would expect them to occur, he will examine the image on the focussing screen with a magnifying glass. If he then detects any sign of a halo there it is clear that nothing can prevent it showing on the plate. The curious results he mentions are so far from being unnatural that they can readily be caused, at will, by the adoption of certain methods of lighting, and are almost equally capable of avoidance.

In reply to "J. A. R.," the use of a suitable dull-surfaced black paper

in contact with the Indian ink will undoubtedly, to a great extent, overcome the evil effects caused by employing the colour alone. I think, however, there are many other backings much to be preferred, some of which he has himself mentioned.—I am, yours, &c.,

A. LOCKETT.

88, Brook-street, Kennington-road, S.E., September 23, 1901.

THE KODAK COMPETITION.

To the EDITORS.

GENTLEMEN,—We shall esteem it a favour if you will kindly notify in the columns of your valued JOURNAL that the date of the closing of our Brownie Kodak Competition has been postponed to November 30.—We are, yours, &c.,

KODAK, LIMITED.

43, Clerkenwell-road, London, E.C., September 23, 1901.

THE LANTERN SLIDE EXCHANGE CLUB.

To the EDITORS.

GENTLEMEN,—We are about shortly to commence our 13th season. Should any one who is a fairly experienced worker desire to join I shall be prepared to send particulars on receipt of application and a sample slide of average work. The subscription is one shilling.—I am, yours, &c.,

J. S. HAWKER, Hon. Sec.

Mutley House, Plymouth.

THE TANQUEREY SYSTEM IN LONDON.

To the EDITORS.

GENTLEMEN,—I write to expose what I call an arrant fraud, based upon the Tanquerey system. A lady canvasser called upon me, and stated that during the space of thirty days the firm she represented were open to give a 15×12 enlarged picture from any photograph that I would entrust them with. I particularly made the inquiry from the canvasser if I was obliged to buy a frame from the company for the enlargement. She positively stated that there was no such obligation or liability incurred by me. On calling to see the proof I was met by the demand for a frame, the lowest price being 15s. 6d. From an expert I have ascertained that the value of the picture was approximately 2s. to 3s., it being an unfinished bromide. After considerable trouble I obtained the original photograph, and on calling again, before their eyes, I destroyed the enlarged photograph, which I had the greatest objection to being showed as a specimen. The scheme seems to me to particularly affect and be hard upon poor people, who are persuaded to have and pay for the frame by the instalment system, obtaining a thing of paltry value at a most exorbitant cost. I am sorry to intrude upon your valuable time, but I think the matter should be exposed.—I am, yours, &c.,

A CONSTANT READER.

[The firm complained of by our correspondent, a lady, has business premises at the West-End of London.—EDS. *B.J.P.*]

TINTERN ABBEY.

To the EDITORS.

GENTLEMEN,—The announcement in the "Globe" and other papers respecting photographing at this noble ruin being prohibited is like many other bits of information, absolutely false. Reading the same, I did not for a moment believe it, and, having a friend of good standing at the Woods and Forests, determined to ascertain the truth, and point out the absurdity. On second thoughts, however, before calling, having recently visited Tintern, I determined to write the caretaker, who was very courteous to me, to know if such was the case. Here is his reply:

"Tintern, near Chepstow, September 20, 1901.

"Dear Sir,—In answer to your letter of the 19th, I am glad to say the Abbey is being carried on exactly the same lines under the Woods and Forests as before. With regard to the reports you have seen in different papers concerning the taking of photographs in the Abbey, they are without the slightest foundation of truth, and whoever put it in the papers had no authority to do so. I am pleased to say the Government have appointed me caretaker of the Abbey and hope to remain here.—I remain, yours faithfully, Caleb Cobb, Caretaker."

Forty-seven years ago I paid my first visit to Tintern Abbey for a 12×10 series. Seven years later I made 83 stereo negatives. I had special permission then from the late Duke of Beaufort. I very well recollect sending a set of them to the Duke, who wrote me stating they afforded great pleasure by their wonderful reality, saying such scenes would give great delight, ending by an invitation to visit Badminton, which I need hardly say I accepted and enjoyed. I recently, after 40 years, packed my tent, used there in 1854, and spent three days in glorious weather, returning with thirty 12×10 negatives and ninety-six stereos. Two hours spent at Chepstow Castle the following morning made an addition of six 12×10 and 12×10 stereos. I need hardly say I was delighted once more to visit such a charming spot.—I am, yours, &c.,

HORATIO NELSON KING.

4, Avenue-road, Goldhawk-road, W.

LECTURES ON PHOTOGRAPHY AT THE TECHNICAL INSTITUTE, REDHILL.

To the EDITORS.

GENTLEMEN,—I am sending you a copy of the notice or my lectures on photography, to be given at the Technical Institute, Redhill, this winter. I hope to make the lectures interesting and popular, with plenty of experiments and demonstrations, so that they may be well attended. These photographic classes I consider a step in the right direction towards the better education of the photographer, both amateur and professional, in the scientific principles and practice of his art; and I hope that ere long we may see the classes firmly established as a regular part of the curriculum of all technical institutions throughout the country.—I am, yours, &c.,

F. MARTIN DUNCAN.

1, Crescent-road, South Park, Reigate, Surrey, September 16.

The syllabus of Mr. Duncan's lectures is as follows:—The camera: various patterns for field and studio. The various movements of a camera and their use; elementary photographic optics; how to focus, and the selection of lenses for various purposes; composition of plates; the wet plate process; the gelatine dry plate; exposing the plate; correct exposure; how to estimate exposure; exposure meters; developing the negative; fixing and washing; developers and their action and composition; faults in development; over and under-development; reduction of density; local reduction; intensification; retouching the negative; printing on gelatino-chloride or P.O.P.; printing in clouds, etc.; after treatment of the print; toning and finishing the print; bromide prints; halation and its causes; the dark room; the studio. The fee is 5s. for the course of twenty-eight lessons, which are given on Monday evenings.

LANTERN MATTERS.—A REPLY TO "FREE LANCE."

To the EDITORS.

GENTLEMEN,—I am willing to confess myself of the number of ignorant lanternists (which is presumably very large, seeing that Mr. "Free Lance" devotes so much space to enumerating expedients which are probably known to most tyros), the more so that, living far from centres of supply and information, I have constructed the larger part of my apparatus, or had it made to instructions. I have rarely failed to get valuable information from your columns, so generously open to the ignorant, and I should have been most grateful to Mr. "Free Lance" had his observations cleared up my query. I have employed both tracing cloth and ground glass in the early days of the cinematograph, but the surface obtainable without joint is impracticably small; the tracing cloth is very subject to injury. Thick sheeting when moistened with water or water and glycerine will obviate the glare, but there is an enormous loss of light. Other materials there are which, though wet, do not prevent the glare. The wetted screens, too, in some conditions, dry in patches before the close of the exhibition, producing a most undesirable effect.—I am, yours, &c.,

A VERY IGNORANT LANTERNIST (by name, "Photophil.").

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PERMITS TO PHOTOGRAPH.—H. writes: "Can you please tell me whether I should have to get a permit to photograph in Hyde Park or St. James's Park, and if so who should I get it from?"—In reply: Permits are required for both parks. They may be obtained from His Majesty's Board of Works, Whitehall, S.W., and last for a year.

"MEN AND WOMEN OF NOTE."—"C. S." writes: "Please say if you are aware if such a publication is yet in existence as 'Men and Women of Note,' published at 153, Fleet-street? It is three years now since I got a commission to send views of Whittinghame (Mr. Balfour's estate). These were published in May, 1898. I have written several times, and made inquiry to trace the parties to get payment, but all inquiry is unavailing, though my letters are never returned. I think such conduct in a public journal owners highly reprehensible. Even an agent failed to find any trace of the paper. Any way or means whereby I could follow up the editor of the paper would oblige."—In reply: The name of the publication is not mentioned in Sell's "World's Press" for this year. We should advise you to write to the printers, whose name you will find on the copy of the publication you have. They will be able, no doubt, to give you some information.

SULPHURIC AND SULPHUROUS ACIDS.—J. B. asks: "Which is the best or proper acid to use for the hyposulphite soda bath for fixing plates? Why do some formulæ instance one, and some the other?"—In reply: Sulphurous acid is what is usually employed, and, on the whole, it is the best; that is if an acid bath is employed at all. We prefer plain hypo ourselves.

BANKRUPTCY.—W. C. B. asks: "(1) After a man becomes a bankrupt does he lose the copyright of his negatives? (2) Can photos of persons be sold by auction by the Official Receiver's instructions? (3) Is a camera a working tool re 'bankruptcy'?"—In reply: 1 and 2. When a person becomes bankrupt the whole of his effects pass to the Official Receiver to dispose of for the benefit of the creditors. 3. A camera passes with the other effects.

COPYRIGHT.—"THOMAS" writes: "Kindly tell me if it is permissible to send for reproduction in a magazine photos taken by a firm abroad? There is no name or mark or copyright on the pictures, and they are wanted for illustrations of articles."—In reply: If the photographs are copyright, as possibly they are under the International Copyright Convention, it would be illegal to reproduce them here, as it would subject the publisher to damages for infringement of the copyright.

IMPURE GOLD SOLUTION.—W. H. R. writes: "I have a quantity of gold which has been dissolved in impure water. Could you tell me how to throw the whole of it down, so that I can make use of it, and will it require any other treatment before re-dissolving?"—In reply: Precipitate the gold with a solution of ferrous-sulphate, wash, and redissolve in aqua regia (nitro-hydrochloric acid), and crystallise. You will then have the chloride of gold in its original condition.

HYPO ELIMINATORS.—H. MOONEY writes: "Can you tell me a formula for destroying hypo from prints, so as to save a great deal of washing? I have been told that alum is a hypo eliminator. Is that so?"—In reply: Alum decomposes hypo, so do many other so-called "hypo eliminators," but in the majority of cases, if not in all, what is left behind is as bad as the hypo itself. The best hypo eliminator we know of is water, freely used, after the print is thoroughly fixed. That is what we use ourselves.

VIEWS OF FOREIGN CATHEDRALS.—H. C. D. writes: "I am desirous of obtaining a series of views of foreign cathedrals (French and Continental). My inquiries of the principal English houses have not been very successful. Would you be good enough to inform me of such foreign firms as are best known for this particular branch of photography?"—In reply: We would suggest that you write to Mr. Albert Levy. He will probably be able to supply you with views of French cathedrals, and, possibly, help you further. Mr. Levy's address is Asnières (Seine), France.

ENLARGING.—F. G. writes: "Whether it is absolutely necessary to use a condenser for making enlarged bromides with incandescent gaslight? I find it does not illuminate the picture all over evenly. Would a condenser between the light and negative alter, and give an even light over the enlargement?"—In reply: If a condenser be used, and it is rightly arranged, even illumination will be secured. By interposing two or three thicknesses of ground glass between the light and the negative a fairly even illumination may be obtained, but not so satisfactorily as by the use of a condenser.

PHOTO-BUTTONS.—M. T. writes: "I should feel obliged if you could give me a little information. There is a man that does nothing but copy my photographs and make photo-buttons and sell them. Is there any way I can stop him; if there is, how? Can you tell me who supply these buttons, and are they ready coated for priniting?"—In reply: Unless the copyright in the photographs is registered you cannot prevent them being copied. The Artistic Photographic Company (we think is the name), Kentish Town, supply the buttons, we believe, but they are not ready coated for printing.

LENS FOR PORTRAITURE.—"ALPHA" writes: "Can I trouble you to advise me the style of lens I shall require to produce negatives giving full-length cabinets, full space allowed 12 feet only? I may say I require the lens for portraiture only."—In reply: The shortest focus portrait lens advertised to cover cabinet size is about eight-and-a-half inches equivalent focus, and that, for a full-length cabinet portrait, requires about thirteen or fourteen feet between lens and sitter. Even with such a lens the perspective will be violent. If you require to work in a shorter space than that a shorter focus lens must be employed, and then the perspective will be very violent indeed.

MICROPHOTOGRAPHY.—"W. V." writes: "I have a superior microscope, and intend doing some microphotos. I think many of the minute micro slides would enlarge, and some excellent prints on P.O.P. or platinotype might be made. Would you kindly advise me if you know where such things would be likely to find a ready sale, as I cannot afford to do them for nothing, although it is one of the most fascinating things in the whole range of photography? Also kindly name the best book on the subject."—In reply: Are you confusing the terms "micro-photos" with photo-micrographs? If it is the latter you wish to do, Mr. Andrew Pringle has published a work on the subject, which may be had through Messrs. Dawbarn and Ward, or any bookseller. If it is the former you wish to do, we think you will not meet with a sale for them. Many years ago they sold merely as a curiosity, but that was in the very early days of photography.

PRINTING PROCESS.—C. J. S. asks: "(1) Is there any process to print photographs quickly, say, by artificial light, and for them to have the appearance of ordinary printing-out paper? (2) What difference would it be as regards expense over ordinary P.O.P.?"—In reply: (1) A glossy paper of the Velox type will yield results very similar to ordinary gelatine printing-out papers. (2) There would be no material difference in the cost.

ELECTRIC LAMP FOR THE STUDIO.—R. E. R. writes: "Can you advise me as to electric lamp suitable for studio work (arc)? I hear Mr. ——— uses one which he takes about with him, but I cannot trace maker's name and address. I know of Adamson's and Morgan's."—In reply: We have no doubt either of the firms you name would supply you with a portable apparatus. Have you written to them on the subject? We are unable to say who were the makers of the apparatus that Mr. ——— employs. Messrs. Gwynne and Co., Brook-street Works, also make a speciality of electric lighting for photographic purposes, but we do not think they have a portable apparatus.

FREAK PHOTOGRAPHS.—W. WALKER writes: "Some time ago I saw some comical photos, a man carrying his head in his hand, or under his arm, wheeling it in a barrow, or having it on his plate at dinner. Will you kindly tell me how to make these photos?"—In reply: Messrs. Adams and Co. and others supply caricature backgrounds for producing grotesque portraits. The kind you mention are usually done by double prints, or by a duplicate exposure in the camera with suitable masking. The methods of doing it have been frequently described in back volumes of the JOURNAL and the ALMANAC, but space will not here allow of their reproduction. On some future occasion we may, possibly, give an article on the subject.

ENLARGING, DEVELOPING, &C.—H. S. writes: "(1) Is there any medium that can be used with oil paints that on bromide enlargements will cause the paint to dry perfectly dead, without shiny surface? (2) Can you give me a formula for developing plates that possesses the following qualities, viz., very rapid in action, giving density easily, clear shadows, and its action not greatly retarded by a low temperature? I see there are plenty of formulæ in the ALMANAC, but it is difficult to hit on the right one."—In reply: (1) If the ordinary tube oil colours be diluted with turpentine instead of oil the work will dry with a dead surface. (2) Any of the developers given in the ALMANAC will be more rapid in action if used more concentrated, i.e., some of the water omitted.

LENS AND SHUTTER QUERIES.—M. KUM writes: "I use a 5½ in. III. Cooke lens in hand camera, with a Thornton-Pickard roller-blind shutter in front. If I have the lens fitted with a Bausch and Lomb Unicum shutter will it, when working at f-11, give a sharper definition with the unicum than with the roller-blind shutter, and will the unicum, with lens at f-8 or f-11, allow of more light action on the plate than the roller-blind, both at same nominal speed of $\frac{1}{25}$ second? Which is the best shutter, Bausch and Lomb Unicum, or Thornton-Pickard Iris? Would you advise change from roller-blind to either of above for better definition and fuller exposure?"—In reply: In practice there will be little or no difference between the two shutters.

THE ASSOCIATION OF ROYAL WARRANT HOLDERS. — "OXON" writes: "Three or four weeks back I wrote asking you if you could oblige me with the address of the Secretary of the Association of Royal Warrant Holders. You suggested that the letter should be addressed as above, with the addition of London, but unfortunately it failed to find the said official, and has been returned through the Dead (returned) Letter Office. I have carefully searched the London Directory, but cannot find such an Association. Is there any other book or publication that you know of that would give me the address?"—In reply: We regret we do not know the address of the Association. Possibly some reader, who is a member of it, will kindly supply the desired information.

PROCESS WANTED.—"DEVON" writes: "Can you give me details of an easy process by which photographs can be transferred to a lithographic stone and printed from, or any means of reproducing them by printing on ordinary paper, which is within the scope of the average amateur photographer? If the process is too complicated to describe in your columns, will you recommend me a work on the subject? I want to work the process commercially for reproducing my own photographs on bill-heads, etc, etc."—In reply: The description of the different methods, to be of any use, would take up too much space in this column, therefore we must refer you to such works as Burton's "Printing Methods," or Wilkinson's book on the photo-mechanical processes. They may be had through any of the photographic dealers.

CAMERA FOR SMALL PHOTOGRAPHS.—D. I. writes: "Can you tell me the agent's or maker's address of camera and printing apparatus for taking photographs by the same method as the strip of photographs enclosed were taken by? They were taken by incandescent light. The camera and other apparatus is an American invention. Have you any idea how they are printed, and what kind of paper they are on? I enclose card given to sitter at time of sitting. Perhaps you will have seen the camera and apparatus I mean at work."—In reply: We do not know the American apparatus. But apparatus for the same purpose is supplied by Messrs. Seaman and Sons, Chesterfield; Marion and Co., and others. The prints sent are on bromide paper. They, with the card, have been returned by post, as requested.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Guns and Hand Cameras.

There would not seem to be much connection between these two subjects, though there has been patented a hand camera in the foolish guise of a pistol. What we refer to is a paragraph of news from the north to the effect that an after addition to the Glasgow Exhibition is a new gun-sight by Sir Howard Grubb. From the description given there seems no reason to doubt that a similar principle might be applied to the construction of a finder for a hand camera. The opinions of hand camera workers as to the most desirable form of finder vary to a most remarkable extent—from the old-fashioned small reflector on to a ground glass surface, through the full-size finder, to the "brilliant" finder in its many forms, is a sufficiently large range; but when we consider that many foreign hand cameras have sighting finders more after the fashion of a gun-sight, and that they are preferred by some

workers in our own country, it will be seen that the connection between these and Sir Howard Grubb's sight is not far-fetched. Indeed, as far as the information before us goes, we see no reason why it should not be used for that quick working which only involves sighting for direction, and not for composition. In this new gun-sight (which we read is expected to revolutionise the science of sighting of guns and rifles) the aiming is done by looking through a small lens, when an image of a small white cross is thrown by an optical contrivance a long distance in front of the gun and in line with the barrel, and this image forms the foresight.

* * *

Photography at the British Association. In the course of the meeting Mr. G. M. Minchin, F.R.S., described some photo-electric cells with a marvellous sensitiveness to light. We are familiar with Professor Langley's bolometer, which is capable of registering almost infinitesimal amounts of radiation by means of the alteration of conductivity in a stretched wire as various radiations are received upon it; but Mr. Minchin's apparatus is founded on different principles. Two aluminium wires coated with selenium were caused to assume the well-known light sensitive condition and placed in a liquid in a small glass tube. If one of the wires to be exposed to light remained under the same conditions as the other, no current took place; but if it was enclosed in a tightly fitting glass tube a strong current was produced, an ordinary paraffin candle, for instance, at two feet away gave more than .25 of a volt. The actual intensity of the current produced varied (for small intensities) as the square root of the intensity. A paraffin candle at eight feet gave a voltage almost exactly equal to that given by the light of the bright star Vega as projected at the focus of a reflecting telescope with an aperture of two feet. Mr. Minchin stated that this new photo-electric cell was sensitive to all parts of the spectrum, the voltage developed by the yellow being slightly greater than that due to the other parts. There would almost seem to be in this new cell potentialities in the direction of conveying images by electricity by means of a number of cells, the current from the units of which, passing through chemicalised paper, should impress various depths of colour according to the intensity of the current. Prof. Quincke, of Heidelberg, read a paper of which, as its subject-matter was mainly electrical, we need do no more than quote the title. It was on the effect of light in clearing turbid solutions. In this direction photographers are only familiar with the "sunning" of a silver bath; first the light caused the solution to be turbid, then it became clear, and the bath was fit for use. The Astronomical Sub-Section was distinguished by the exhibition of a very remarkable photograph—neither more nor less than the spectrum of a flash of lightning, which is the first such photograph ever taken. It had only been taken quite recently by Professor E. C. Pickering. No particulars regarding the time or manner of its production had been received, though it is expected that the Harvard Observatory "Circular," shortly to be issued, will contain details. The photograph was that of a considerable flash spread into a broad ribbon. The spectrum of bright lines is complicated and vivid, and if they can be accurately measured the data should be valuable.

The Personality of the Photographer. Mr. Hollinger, in a speech quoted in the JOURNAL, upon the art of being happy, or rather being jolly, seems to have attained to a high standard of Tapleian philosophy and its practice. We hope he will be able to retain it until he dies of a green old age, and that he will further direct that his tombstone be suitably adorned with laughing cherubs, around a heavily gilded statement to the effect that "it is all right." In common probably with the great majority of our fellows, we cannot wing it so freely in the blue. Our stomachs and livers, maybe, are not so good as Mr. Hollinger's. Possibly our experiences of life also have gone to prove that there are depths not to be bridged so easily, nor with so light a bridge, as he would make out. We cannot help knowing that there are hospitals within whose walls things are anything but all right, wrongs that some must make serious efforts to right, ills and woes generally find a readier soothing in the unbidden tear of sympathy than any boisterous assertion that "it is all right." Still we fully agree with Mr. Hollinger as to the good effect a cheerful appearance must have upon those with whom its possessor comes into contact. Applied to the case of the photographer, there is no doubt that a pleasant expression of face, an amiability of manner, and an evident desire to please, tell heavily in his favour all round. The customer sympathetically responds with an expression and pose that make for a good picture, he is not so likely to be so particular over the price, and will give his circle of friends and acquaintances the benefit of his own favourable experience, so nicely coloured as to induce them also to enter the studio. It is not given to all to be constitutionally cheerful and look at the bright side of things. Their brain molecules are such as will not group themselves into the necessary combinations, nor vibrate to the stimuli, that mean smiles. They do not see jokes, or if they do they treat them in much the same sober fashion they do texts and epitaphs. Practice may do something to counteract such a state of things, but not much. Besides, practising smiling with a customer is risky work. Nothing is more readily detected, or more instinctively disliked, than an artificial smile. However, there is comfort for those whose mouth corners droop instead of turning upward. If the old saying, that many a bright smile covers an aching heart, be unfortunately true, it is quite as true on the other side that many a sober look covers a bright and happy heart. Many grave faces are extremely taking and pleasant. So let the non-smiling photographer take heart of grace—his fortunes need not necessarily be bound up in a smile. Far more important than a smiling demeanour, and reaching more deeply, is the ability to read character, and act upon the reading. This, like the faculty of looking at the bright side of things and smiling, is something of a natural gift, although possessed by most in more or less degree. In all cases it lends itself eminently to improvement by the habit of intelligent observation.

* * *

The Personality of the Sitter. But necessarily associated to practical purpose with understanding a customer is the acting upon the knowledge, and handling him to advantage. The studio offers a fine field for observation. Every customer naturally wishes to look his best, and in the effort to do so is more or less off his guard for the time being. The slightest action will betray the weak point, and

ive the observer the key to character. To his etriment and business loss many a good man s slow in using the key. He should do so boldly. 'he pose of the town councillor, for instance, s dignified. He is a good and worthy man, and fully deerving of the mayoralty that will probably be his next ear. Let him be handled on his own ground. Let the ommonplaces of the weather go, and do not attempt tc xplain any photographic matter to him. Introduce instead the leading matter of municipal interest—the new vaterworks, the electrification of the tramways, the appointment of borough treasurer, or what not—and listen to vhat he has to say. He will be interested, and will show t. So will you, or ought to be, if anything of a citizen. The dignity of the vicar is of a different, and a higher, kind. He is a true man, so deal gently with his innocent little vanities, the true cut of the ecclesiastical waistcoat, or the hapely calves outlined in the archidiaconal gaiters. He an be very interesting upon many subjects—may even now what an archdeacon's duties are. Give him a fair hance anyhow. It will pay you if it ultimately means two lozen prints instead of one, with a bazaar possibly at hand. But town councillors and vicars will not bring a living. Very true, but the principles of action indicated will apply qually well in all other cases. If the favouring of the side of the head is to show wealth of hair, state rankly that you would like to do justice to the undoubtdly beautiful feature. It will mean another customer interested and pleased—still more so if opportunity be diplonatically offered to the statement of how much longer these particular tresses are than the normal. It is all fair enough, airer probably upon the whole than the pointed and vaxed ends of the moustache of the would-be carping critic. By the way, let the same moustache come out well, with the ull aid of the retouching desk if necessary. Ringed ingers may be brought to the front, with a request that the and be naturally arranged to show them. It may be poor rt, but it is an uncommonly good way of making a business uccessful. Every photographer has the opportunity at the ame time of becoming a philosopher. And although his hilosophy may be tinged at times with a dash of cynicism t the extent of human vanity, upon the whole it will be edeemed and given a healthier colour by many pleasanter nd higher experiences. Even vanity itself, in reason, and he right people, can be pleasant and refreshing. He must e a dry chip who does not respond in mood to the winning mile of the young bride, her interest in the young fellow t her side fortunate enough to call her wife, her desire to ring the wedding ring well into evidence, her lightsome ittle airs and ways generally. Here is a chance for a sympathetic agreeability of manner to keep the pleasantness alive, and here also a chance for a final earnest, "I hope, I m sure, that you will be as happy throughout life as you re to-day." Venture boldly on it, whatever the degree of he customer. It is certain to be acceptable if properly put, nd will be remembered with pleasure always.

* * *

Patent Law Reform. Any alteration in the patent laws of this country would affect the interests of photographers and the photographic world generally. At a recent Conference held at the Manchester Chamber of Commerce for the purpose of considering reforms in the Patent Law of this country, one speaker said, "They did not ask for special privileges for traders or manufacturers, but they did contend that the Patent Laws here should not put them at a disadvantage with competitors abroad. At present they were very much handicapped by discrepancies which existed in the different laws of different countries. There was no doubt whatever that a thousand and one articles were sold in this country at monopolist prices. Those articles were imported here. They ought to have been made here, and would have been made here but for the defects of our Patent Laws. There was no doubt that many of these monopolies had become perpetual monopolies, and that foreign patentees managed to get hold of the market." The Birmingham correspondent of the "American Machinist," in a recent issue of that paper, wrote:—"Some dissatisfaction exists in this district relative to the present state of the patent law. A case in which a local patentee was deprived of the advantages of his invention in the United States through what is regarded as an anomaly in the international law has led to an exhaustive inquiry in America, and has directed a large amount of expert attention to the matter. The question is whether a patent registered here should forthwith be held as protected in the United States, or whether priority should be given to a competitive title which may be applied for in the United States between the English registration and its repetition in America. The British Government, it is understood, is endeavouring to obtain such an alteration of the law in the United States as shall insure for foreign patents the simultaneous recognition which is accorded in European countries. Mr. William Priest, the head of a well-known cycle company, who was instrumental in raising this question, has also put into concrete form proposals for the remodelling of the British Patent Law and its administration. He says the most urgent need of manufacturers in connection with patents is the establishment of a Patents Court, presided over by a judge or judges well versed in Patent Law, precedents, etc., assisted by permanent official experts. At present, he urges, everything is in favour of the longest purse. Obstructive patents should be thoroughly dealt with. He defines obstructive patents as 'patents which are filed merely to cover some principle, and then left unworked to catch some practical inventor who comes along later.' . . Then Mr. Priest would make an end of the 'benevolent interpretation' of loosely drawn specifications. To better insure the security of a patent, he suggests that if it has been worked for five years, and the wants of the public are met, its validity should be unassailable, as is the case in Germany."

* * *

Modifications Required. There can be no doubt that certain modifications in the British Patent Law are urgently required. The patenting of a process sometimes hinders its development, practically and commercially. It would no doubt be to the advantage of the general community if there were more investigators who possessed the spirit of the famous scientist, Michael Faraday, men who would freely give the results of their investigations to the world. Men of his stamp are, however, not likely to increase in number. But if there are men who prefer to present the results of their labours to the community, it ought to be made impossible for certain so-called inventors to patent processes which are really not original. At the same

time it does not seem unreasonable that the discoverer of a valuable process, perhaps after the expenditure of much money, time, and labour, should, if he chooses, reap some material advantage. In many cases discoveries and inventions are merely a matter of priority. Several investigators may discover a process or devise some valuable article practically simultaneously. In respect of many valuable inventions it will be found that the persons who derive the greatest pecuniary benefits are those who exploit the article, the Hooleys of the company promoting world. When the real inventor of a valuable or a readily saleable article has been handsomely rewarded, in many cases it would be no hardship to those who have been concerned in the exploitation of the article if the period of protection were curtailed. When an inventor, after incurring great expense in experimenting, etc., finds that he has not been recouped, after the ordinary period of protection has run it course, the Courts will rightly grant him an extension. On this principle, when a company, which may be in no way responsible for the invention of an article in general demand, realises exorbitant profits, the period of protection might very well be curtailed. This would probably be considered a drastic procedure, but it would prove beneficial to the community, and it would thwart the operations of grasping company promoters, whose special mission is to monopolise and corner everything on which they can lay their hands.

AN ACQUISITION IN CARBON PRINTING.

THERE can be no question that carbon printing is far more popular now, amongst amateurs, than it has ever been since the process was first introduced. This is, no doubt, greatly due to the manufacturers supplying the tissues sensitised and ready for use in small quantities to suit amateur requirements. Although the sensitising of carbon tissue is, after all, a very simple affair, and involves but little trouble, still few persons care about incurring even that when the same end may be obtained without it; and so it is with carbon tissue amongst the majority of photographers, both professional and amateur.

It is, however, an unfortunate circumstance that carbon tissue, after it is sensitised, if kept under normal conditions, becomes insoluble and unusable after the lapse of a comparatively short time—two or three weeks—sometimes in less time than that if it is too freely exposed to the atmosphere, and that happens to be moist or humid. There is another point in connection with carbon tissue, which is that, after it has been printed, the prints gain in depth if they are kept long between printing and development. This, in some cases, is an advantage, though in others, particularly with novices in the process, it is just the reverse.

This property in carbon tissue is an important one, it may be mentioned, and was well known to the very earliest workers of the process, but it was not until many years afterwards that it was discovered that the continuing action was due to moisture in the tissue, and that if it were eliminated the prints could be kept for many months between their exposure and their development. A couple of decades or more ago Mr. E. W. Foxlee showed, at the old South London Photographic Society, some prints that had been kept for six months between the time they were exposed and developed, and they were no darker than were those which were developed directly they were taken from the printing frame. It was also demonstrated that if the tissue were thoroughly desiccated, after it was sensitised, it might be kept for months without its becoming insoluble. Also, that when it is in this abnormally dry state it is practically insensitive to light, as well as almost impossible to handle without it being cracked, so brittle does it become. For example, if it be thoroughly dried, and then put into a chloride of calcium case, such as is used for storing platinotype paper, it may be kept for many months, during which time it becomes so brittle that it cannot be unrolled without its cracking, and also is so insensitive to light that it is necessary to put it for some time in a damp atmosphere so that it can absorb a certain amount of moisture before it can be manipulated. But then a degree of uncertainty is at once introduced, inasmuch as one has no means of judging the amount of moisture the tissue has taken up, and upon that its sensitiveness is greatly governed.

What is required is a means of keeping the tissue, for a reasonable time, under fairly constant conditions, so that it can be used from time to time as required without further treatment. This end now seems to have been obtained by the Autotype Company. Some months ago we received from them a neat case, the invention, we believe, of Mr. Charles Sawyer, in which the tissue is stored in a flat condition under pressure. At the same time we received some prints that were made on tissue that had been kept in a similar case for three months prior to its being printed. A description of the case, which contains chloride of calcium, will be found in our issue for June 14 last. At the time that we received the case the Autotype Company said in their letter: "Should you desire it, and will return the box, we shall be pleased to place in it some sensitised tissue, to be sealed up for, say, three months, and tested by you at the end of that time." We availed ourselves of the invitation of testing it in practice. The case, with the tissue in it, was returned to us on June 24, and on Friday last it was opened and the tissue examined. It was found to be rather brittle, and required to be handled with some little care to avoid cracking it, though there was no apparent dampness in the chloride of calcium—as if it had absorbed much moisture.

A piece of tissue was taken out and placed in a warm water, when, after a few seconds, the pigmented gelatine began to dissolve and leave the paper freely, just as is the case with freshly sensitised tissue. We then made some prints upon it. As the tissue seemed to be very dry we anticipated it would prove somewhat slow in printing; such, however, we afterwards found not to be the case, for it turned out to be of about the ordinary sensibility. The prints developed freely, and behaved just as if the tissue had only been sensitised a day or two before. The high lights were perfectly free from fog or veil, and even the "safe edge" round the negative was quite free from the slightest tint, the paper being absolutely white; in fact the tissue appeared to have undergone no change whatever through its long keeping.

These cases should prove a boon to those who do carbon work only occasionally, and do not care to purchase a dozen pieces when they, perhaps, only require to make half a dozen prints, well knowing that the other half will be wasted. Therefore the cases should still further popularise carbon printing amongst amateurs and those who only work the process on a limited scale.

CHEAP LENSES FOR AMATEUR USE.

[By An Amateur Optician.]

The term *cheap* as applied to lenses, such as are used by photographers, is after all only relative; we have in our collection of lenses a small rectilinear (with no name upon it to denote its origin) of five inches focus, which, for covering power, even illumination, and brilliance of definition, is easily the superior of a companion lens sold with the imprimatur of a well-known maker at more than twice the sum paid for the nameless instrument: the latter, costing only thirty shillings, is undeniably the better of the two. Although such lenses of more than average excellence are not to be met with every day—as bargains, that is—we have frequently handled small lenses of the rectilinear type, and found them more often than not of very good quality; we refer, of course, to the low-priced rectilinear sold without name, and probably of foreign make. The youthful, and often needy, amateur is to be congratulated on the fact that he can, for a few pounds (which sum a few years ago might have sufficed for the lens or the camera, but not both) purchase a complete outfit capable of producing with careful and *intelligent* use much good work—good enough for the Salon or even the Royal. We doubt, however, whether the class of amateur, more particularly referred to, and who is frequently the possessor of the one and only lens which he finds already attached to the front of his camera, is best served with that optical combination; at the best his operations are very strictly confined within very definite and hardly drawn limits, and to this reason, perhaps, may be assigned the many egregious failures and faults of composition and arrangement which are so frequently to be met with. One can, as a rule, trace the effects directly to the cause.

Rather than place this restriction upon the well-meaning tyro, would it not be better on all grounds, but more especially in the interests of rational photography, to supply him with an optical instrument which would, at only a little extra cost, serve him for the multifarious list of subjects which he will undoubtedly essay. It is all very well to fit out a client with a half-plate or whole-plate camera, and supply him with a lens of eight, nine, or eleven inches focus; but what will it be when he, as he certainly will, tries to photograph his drawing-room, or study, his family in detail and in the mass, his house and garden and church, and attempts to copy that photograph of his dearest friend? The results invariably are that the drawing-room interior embraces one small corner of that elaborately furnished apartment; his portraits are of the "bust" type, very much so; and his groups a set of heads in mosaic, with here and there a stray limb as a sign of good intentions; his house and church will be minus chimney stack and steeple; while his efforts at copying will resolve themselves into postage-stamp photographs, in or near the middle of a large expanse of plate. The reasons for this state of things are, of course, perfectly obvious to the experienced, but not to the tyro; in fact, as a rule, the lens, though good enough in its way and for its special adaptations, is not quite the instrument which would best suit the amateur user—one of shorter focus and wider angle would better meet the case.

The question is, however, whether the *demand* for sets of apparatus, complete outfits of, say, four or five pounds value, might not be utilised as a means of bringing into more general use that very useful optical combination known as the "Universal" or casket lens.

The late Mr. Traill Taylor had a high opinion of this class of lens, its utility and capabilities, as will be seen by a perusal of his work on the "Optics of Photography and Photographic Lenses," chapter 15. Our amateur with the one lens is in the position delineated by the author mentioned, he "has his camera pitched at the one point from which alone the composition of the subject is perfect, but when focussed upon the ground glass it is found that either too much or too little of the scene has been got in. Then why not carry a battery of lenses, so that when one fails in delineating upon the ground glass just so much as is wanted and no more, it may be deposed in favour of another which will better fulfil the requirements of artistic composition? While such an expedient is to the individual possessing ample means the most satisfactory that could be adopted, it is open to the serious objections of great expense and much bulk—especially the former." The author then goes on to refer to the system whereby having one mount and several lenses of varying foci, each conveniently and properly set in its cell, you interchange these lenses, producing therewith combinations which should serve for the different classes of work which the photographer finds himself wishful to undertake. We might not have referred to this "casket" system, but for the fact that such sets of lenses are to be had of very good quality at a reasonable price; and in order that we might, with certainty and satisfaction, suggest them as an alternative in many cases to the lens usually fitted to sets, we have made practical trial in the study and out of doors with just such a combination as would, we feel sure, have met with the approval of such an authority as Mr. Traill Taylor.

We need not particularise the various pictures taken, but they comprised the usual series of subjects, portraits and groups, interior and exterior views of buildings, and several landscapes. The "casket set" used sells at forty shillings, and consists of the usual brass mount with iris diaphragm—the mount itself may for wide-angle combinations be shortened by unscrewing a section of the body; the lenses are four in number, double achromatic of 6, 10, 14, and 20 inches focus respectively; briefly put, the combinations are made up by union of any two of the lenses, the sum of the two foci: say 20 and 14, or 14 and 10 divided by four gives approximately the focus of the combination, and we therefore have rectilinear combinations of $4\frac{1}{2}$, 5, $5\frac{1}{2}$, $6\frac{1}{2}$, 7, and $9\frac{1}{2}$ in. focus covering (and covering extremely well too, as we found) plates from quarter to whole-plate and larger; or used as wide-angle lenses (with the body of mount shortened as above mentioned), covering plates from 7×5 to 12×10. The lenses can also be used singly as single landscape lenses. Now, here we have combinations which would amply satisfy the average amateur; he would be able to vary his lens to suit his subject, and be altogether free of the restraint put upon him by the one fixed lens which at present he has to make do, suitable or unsuitable; he would be independent to a great extent of his environment, as in cramped situations he would be able to use his wide-angle combinations, or if unable to get close enough to his subject he would use his narrow and longer focus lenses, and quite naturally his work would be vastly improved, to the unspeakable relief of himself and friends. The only possible objection we could raise to such a set as we used is that of rapidity. They are called *rapid* rectilinears; they are rectilinear, but we rather doubt the rapidity. But this objection may be taken for what it is worth; if one is unspoiled by use of rapid lenses of the euryscope pattern, such a fault would not be noticed.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[First Notice.]

It was with expectation not unalloyed with anxiety that those interested in the welfare of the Royal Photographic Society awaited the opening of last year's Exhibition. The Society's exhibitions had never paid their expenses, but the loss, though one which the Society could ill afford, was not a ruinous one. In doubling, nay trebling, the magnitude of its exhibition the Society did that which the importance of photography demands of its national institution, but it ran a great risk. That the experiment was entirely a success is now ancient history.

This year's Exhibition has been looked forward to with considerably less excitement, but not with less interest. In spite of the difficulties which must naturally arise in so vast and sudden an extension of scope as that entailed in occupying and filling a suite of galleries instead of one only, the organization was so admirable that it was difficult to see in last year's Exhibition where there could be any improvement except, of course, in minor points, and we may say at once that this year's Exhibition, following as it does the general lines of last year, to the casual visitor presents practically the same appearance. In dealing in detail with the various sections we shall be able to point out, however, that the organization of the Exhibition has fully kept pace with the general progress of photography.

As before, the West Gallery is entirely devoted to selected pictorial photographs. In the North and South Galleries, too, the work of professional and trade photographers is shown. The technical and scientific photographs are hung in the balconies. The dealers in apparatus, etc., occupy the central hall, and the apparatus, etc., entered for competition is shown in the South Gallery. The lantern displays,

which are given every Monday, Wednesday, and Saturday evening during the period of the Exhibition, at eight o'clock, take place in the North Gallery.

Following our method of last year in this, our first notice, we shall only deal in detail with the exhibits in the scientific and technical section, but a few words of general criticism will not be inappropriate at this stage of our review.

Numerically, the pictorial photographs are within a few the same as last year, and they occupy about the same wall space. There is a decrease in the number of pictures of large size, but a decrease also in the number of very small frames brings the average size to about the same. It is usual to lament the absence of pictures which, from their subject-matter or from decided originality of treatment, form a special attraction, and this lament will probably be heard again this year; but, looking upon this Exhibition—as one has every right to look upon the Royal Photographic Society's Exhibition—as the meter of progress in photographic work—it is certain that satisfactory progress has been made. A few years ago, when the impulse was first evident of what has proved to be an almost revolutionary change in ideals and methods in pictorial photography, it was noticeable that in the work of most of the leaders of the new movement good sound photography was quite a rarity. Many of those who took a prominent part in the movement openly expressed their contempt for that perfection of technical quality which is, and always has been, as essential as good art in the making of a good picture, and often a man who was actually an expert in photography went out of his way to eliminate from his work all evidence of his photographic skill in his endeavour to follow the fashion of the day. Happily, a better state of things now prevails, and in a very large majority of the pictures there is nothing to offend even the most insistent representative of the old school. There are also many examples which might serve as specimens of what is usually termed "technical photography," while equally deserving of praise for their pictorial excellence. Continental art in photography, as in painting, keeps its distinctive character, and American photography, until quite recently almost entirely of the incisively sharp and excessively brilliant kind, in its sudden awakening to other possibilities, has followed the Continental school more closely than our own, but it has characteristics which distinguish it from either. Both Continental and American photographers are fairly well represented in the Exhibition, the latter being more strongly in evidence. The American work is distinctly better than that in last year's Exhibition. In some of it there is the same tendency to bid for notice by means of extravagance and an excess of mystery, rather than to strive for admiration by simplicity of treatment; but, on the other hand, a fair proportion shows that prudence and restraint which are inseparable from true and sound artistic work. The Selection Committee are evidently more lenient with the work that comes from abroad than with that of home origin, and we will not say their expedience is unjustified. We are glad to notice that each successive Exhibition shows a greater spirit of independence on the part of pictorial photographers. There is, year by year, less tendency to follow too closely the lines of the successful work of others. It used to be quite a common thing to find a picture that made its mark followed, the next year, with a score or so made in unmistakable imitation of it. To the vigilance of the Selecting Committee probably we are indebted for the suppression of most of the attempts of this kind; but it is to increasing self-reliance and a better knowledge of how to study and to gain legitimate inspiration from that which is worthy of admiration that we owe the greater variety both in subject and treatment of present-day exhibitions.

The Scientific and Technical Section shows a decided improvement, but it is still, relatively, not so important a feature in the Exhibition as it should be. In almost every science photography nowadays plays an important part, and there are hundreds of its applications which the average man of the camera has never heard of—work in which photography is used in a subsidiary way as a method of illustrating, verifying, or recording, is so often performed by men who are not in touch with the photographic world that it is difficult to bring to their notice the fact that their results would be supremely interesting to those whose principal study is photography itself, and this in a great measure accounts for so few examples of what may be termed extraordinary photographic work.

The galleries devoted to "professional" work are occupied in about the same proportion as last year by professional photographers, that is to say those who work for the public, and trade photographers, that is to say, those who lay themselves out to do work for other photographers. We should not be doing our duty to either class, especially as it is one of the functions of this JOURNAL to keep a watchful eye over the interests of both, if we neglected to call attention to the waste of opportunity on the part of a large majority of the exhibitors. In very many cases the merit of an exhibit as a whole is seriously lowered by the inclusion of photographs which are commendable neither from the artistic nor the photographic point of view. Selection Committees have always been much abused bodies, but the opinion of the most incompetent Selection Committee, official or informal, is more likely to be the correct one than the opinion of the exhibitor on the merits of his own work. The essence of the system adopted in allotting space in the professional section is that a free hand be given to each exhibitor with regard to his exhibit, but we cannot help feeling that many of the exhibitors would have done themselves and their productions greater justice had they taken into consultation, in the choice of their exhibition pictures, some one who could view the work with absence of that prejudice which the author of it cannot divest himself of, and, if possible, with experience of the difference of effect in the same picture when viewed under ordinary conditions and on the walls of a brilliantly lighted gallery. In the drapery and general get up of their spaces several of the exhibitors show that good taste which should form part of the stock-in-trade of every one who desires to succeed in a profession in which good taste is so eminently an essential qualification; but, on the other hand, there are several examples which point to total ignorance of the simplest canons of decorative art. In two or three cases a background cloth has been chosen without the slightest regard to the tone and colour of the walls of the gallery, and a jarring note is struck which directly harms the exhibitor himself and indirectly harms those who are associated with him in the same gallery. A constant fault is the inclusion of too many frames. It should be remembered that a man's best work is his best advertisement, but if he shows his second-rate work, that also is taken into consideration in estimating the standard of his capacity.

The Entrance Hall is far better arranged this year. The central space has been left clear, and more stringent regulations with regard to signboards and other little matters have resulted in a greatly improved general effect.

The catalogue is admirably printed and got up. It contains a portrait of Mr. Thomas R. Dallmeyer, F.R.A.S., President of the Society, printed in photogravure, as a frontispiece, and is illustrated with twenty-four full-page half-tone blocks, besides line sketches in the text.

THE AWARDS OF THE JUDGES.

The judges in the Pictorial Section were Messrs. P. H. Emerson, B.A., M.B., G. A. Storey, A.R.A., F. M. Sutcliffe, and Lieut.-Colonel J. Gale. Their awards were:—"A Street in Chioggia," Percy Lewis; "The Quarry Team," Archibald Cochrane; "Study of a Head," James Auld; "An Old Kitchen," Bernard Moore; "The Spinet," W. Gill.

In the Technical and Scientific Section the judges were Messrs. Chapman Jones, F.I.C., F.C.S., E. J. Wall, and Major-General J. Waterhouse, I.S.C. Their awards were:—Series of reproductions in photogravure, collotype, photo-lithography, etc.: The Bohemian Graphic Society, "Unie"; Brown Rat (one of a series), Douglas English. The award consists of the Society's bronze medal.

THE PRIVATE VIEW AND SOIREE.

The popularity of these functions is increasing. The private view, which was held on the afternoon of Saturday last, was well attended. At the soiree in the evening the Society entertained about 700 members and guests, the President and most of the Council being present to receive them. The Band of the Royal Artillery enlivened the proceedings.

THE STALLS.

The Central Hall, which is devoted to the exhibits of manufacturers of apparatus, etc., presents a more attractive appearance than last year, while it is no less representative. Messrs. Wellington and Ward, of Elstree, display, on tastefully designed screens, enlargements made of the various bromide papers of their manufacture, both toned and untoned, and a dainty stand enables negatives made on their films to be viewed.

J. H. Dallmeyer, Ltd., have a showcase well stocked with lenses, cameras, etc., of their manufacture, and on a screen they display prints illustrative of the works for which their various classes of lenses are designed.

Sanger Shepherd and Company show apparatus and material for the Sanger Shepherd process of photography in colours, light filters, and fittings for orthochromatic photography and photo-micrography, and other apparatus.

Ross, Ltd., have an interesting exhibit of the various series of their

lenses, a large assortment of hand and other cameras, enlarging and projection lanterns, arc lamps, limelight jets, and their new pattern patent prism binoculars.

C. P. Goerz shows cameras, shutters, lenses, and binoculars.

W. Watson and Son have specimens of their combination studio camera and stand cameras of various other kinds, enlarging apparatus, the Bichrome lamp, rotary developing apparatus for films, hand cameras, and other apparatus.

Burroughs Wellcome and Company exhibit a complete range of "Tabloid" photographic chemicals.

Kodak, Ltd., have an imposing stall, upon which are shown Kodak and panoram cameras, films, papers, and examples of work produced therewith. During the Exhibition they will give demonstrations of the development of their paper, etc.

The Platinotype Company have examples of work done on their platinotype paper. They also show various other materials, and the Platinotype portrait lamp. At intervals demonstrations will be given of the development of platinotype prints, and the use of the portrait lamp.

The Technical Section.

The scientific and technical exhibits comprise all of those entered in the sections devoted to competitive apparatus, the processes of photo-mechanical reproduction, photography in colour, and the many general applications of photography to science and industry. As was the case last year, the Technical Section, under which designation we propose to class all work coming under the above heads, is accommodated in the balcony surrounding the Fountain Court. There is a slight falling off in the number of exhibits compared with the year 1900, but the walls are amply covered, the dimensions of the exhibits being, on the whole, of a larger scale. The section is of a diversely interesting nature, and superior in some respects to that of last year. To repeat, however, what we have already said in our opening general remarks, it seems a pity that the Society is unable to get at the far larger store of interesting and instructive examples of photography applied to science that we daily hear of, but do not meet with in very great numbers in the present show, and it is to be hoped that some means may be devised whereby a future Exhibition may include still more examples of these important applications of our science.

Reproductions in photogravure, collotype, and half-tone form a particularly strong feature of the technical exhibits, and the quality of the work shown is, on the whole, of a satisfactory nature. One of the Society's medals has been captured by a series of eleven reproductions sent over by the Bohemian Graphic Society "Unie," of Prague. Examples of colour collotype, photogravure, and collotype with lithography are included, four being copies of illuminated manuscripts in colour, one a photogravure from a portrait, and six colour prints from various painters' originals. The series seems well worthy of the attention given by the judges. We have seen elsewhere some very fine three-colour book illustrations, combined with letterpress, also done by this firm. It is, we believe, the first time that they have exhibited in London, at any rate at a photographic exhibition.

Meisenbach, Riffarth, and Co., of Berlin, also have an extensive display of photogravure, several being in colours. Their prints are of somewhat large dimensions, the plate of the panorama of the interior of the German Electrical Company's works measuring about one foot by two-and-a-half feet. There is also a pair of reproductions—Rembrandt's "La Dame avec l'eventail" and "Homme Armé"—on 15 in. × 20 in. plates, that attracted our attention for the fine quality of the etching and prints. The photogravures in colour likewise deserve notice as creditable reproductions of subjects such as Anton Graff's "Countess Sophia Potocka," Tischtein's "Queen Louise," and so forth; in fact, the eleven prints by Meisenbach, Riffarth, and Company are certainly amongst the best of their kind.

In England excellent work is being done in the same field by the Art Photogravure Company, associated with the Strand Engraving Company, who have at one end of the balcony five large photogravures from Academy and other pictures. The plates reach a size of about 20×30 in the print of Ernest Stanton's "Close of a Winter's Day," but in this the shadows strike us as thicker and the snow muddier than we should wish. For the other prints we have only words of praise until we reach the facsimile photogravure of her late Majesty Queen Victoria as portrayed in Benjamin Constant's well-known picture seen at the Academy this year. So far as the photogravure goes it is good, although the colouring does not seem to be so rich as in the original in parts; but there is a too manifest touching up of the high lights with thick oil colour to commend the thing as a whole to us. Doubtless the original furnished a very difficult subject for the process, and, so far as it goes, we think the result is commendable, but it is spoiled by the added colour.

There is quite a collection of reproductions in colour. First amongst them may be cited two frames by Carl Hentschel's colourtype process, the subjects being flowers, butterflies, water-colour sketches, and the like. Messrs. John Swain and Son also exhibit work of this character. Looking naturally to the examples of reproductions direct from nature, we find one or two good things, but the pictures of Hatfield House seem crude and unconvincing. A fruit piece is much better, and so are some of the water colours and chromos reproduced. The frame also includes progressive proofs in yellow, red, and blue, and the final proof with the three colours superimposed.

Mr. W. E. Brewerton took a medal a few years ago at Pall Mall for a reproduction in colour that was, we think, better than that of an Iris he now shows. In the first frame we have three separate prints in yellow, red, and blue, which in the second frame are superimposed. He thus describes his method: "The yellow and red prints are printed with carbon tissue, temporarily supported on celluloid, and then transferred to a final support, which bears the blue image in ferro-prussiate."

Close to these are a landscape and a still-life study by M. Lacroix, of Geneva. He has attempted to produce in gum bichromate by Cros and Du Hauron's method a reproduction of the colours of nature without retouching. He is the first to point out and admit that the work is in a purely experimental stage, which being so, it may seem superfluous to add that the foliage in the one is far too green (and that an unsuitable green), with bits of pink that seem foreign to the scene. The other print is better, but lacking also in delicacy of colouring. Dr. Gustav Selle's process of photography in colours is again with us in some examples sent by Mr. R. B. Roxby. Without the originals to guide us they seem fair copies of their subjects, but the absence of the original, or ignorance of the natural object depicted, leads many, we fear, to think well of a reproduction that is but an indifferent copy. It has been so ever since colour photography came into the world, and until we are able to see side by side both copy and original, valuable criticism is almost out of the question.

The London Etching Company send examples of typogravure and half-tone applied to catalogue and price list illustration, and of a similar character is the work by Vaus and Crampton, who contribute a frame of fashion plates and book illustrations. Both of these firms appear to be doing meritorious work. Mr. Charles R. H. Pickard specialises in the preparation of photographs for advertising purposes, and for reproduction as catalogue illustrations, and shows some clean work of good character. Before leaving this subject we cannot omit to mention Mr. Ernest A. Beckett's three collotype prints, which are also creditable to their producer.

No photographic exhibition would be complete without some examples of bird and nest photography. Mr. Reg. B. Lodge and Mr. Cherry Kearton, who are mainly responsible for the popularisation of this sphere of work, have this year some prints that amply maintain their reputation as pioneers. Mr. Lodge shows a picture of a purple heron stepping into its nest, and the method adopted in photographing it is worthy of a few words. A twig is arranged in such a way that, as the bird alights, it is practically certain to disturb it. The interference with the twig is made to actuate an electric shutter on the camera, so that immediately the bird alights it instantly photographs itself. As a matter of fact it is only in this way that photographs of many very timid birds can be got at all, and it is best for his result that, after setting up his camera and arranging the electric release, the photographer should move right away from the vicinity. Mr. Reginald A. Malby has pursued the same class of work with some success in his "Bird Studies," and mention must also be made of the frames by Mr. Oliver G. Pike containing prints of gulls in flight and at rest, and a kingfisher perched on a tree stump that strikes us as very cleverly caught. We believe Mr. Pike also uses the electric shutter at times, and that it is now a recognised adjunct to the photographer-naturalist's outfit. Mr. Kearton also deserves credit for a photograph the like of which we do not remember to have seen before. It is one of some Garden Whites asleep, and still covered with the dew of night. Needless to say it was taken at a very early hour of the day. The globules of moisture are very clearly rendered. His "Reed-warblers at Nest" is also a pleasing print, and none the less a picture because it is in the technical section. Mr. G. E. Carter's snail studies and Mr. H. Nouaille Rudge's animal and bird studies will also engage attention. Captain Fayrer, of the Indian Medical Service, sends an enlargement about life-size of a cobra with head erect and about to strike. Close by are some photographs, by Mr. T. A. Gerald Strickland, of several new species of tropical fly, larvæ, wings, etc., full descriptions of which

appear in the catalogue. Regarding the prints themselves, there is ample evidence that they are the work of one who is no novice in a field which we should much like to think is trodden by more than those who venture to exhibit their results, as there is any amount of learning and pleasure attaching to its pursuit.

The miscellaneous photographs in the Technical Section are not many in number, but none the less attractive. There is, for instance, a series of nine enlargements typical of life and landscape in Cyprus, a British possession which, as Mr. T. E. Mavrogordato, the exhibitor, says, does not attract its due meed of attention. Mr. Mavrogordato, as an official for many years in the island of Cyprus, has collected a large series of views of the country, and the prints on view are selected from these. It is unnecessary to say more than that before this notice appears Mr. Mavrogordato will have given an illustrated lecture on Cyprus at the Gallery, in the hope that the holiday-maker and others may remember the claims of a somewhat overlooked dependency. If we may offer one criticism, it is that the prints have been rather over-enlarged. That they are topographical, and not pictorial, detracts not a bit from their interest.

The exhibits of Mr. Thomas Robertson remind us at once of earlier work performed so well by Mr. H. W. Hughes and Mr. J. C. Burrow. We refer to examples of photography in mines with artificial light. In this case we have miners hewing coal, and drilling for blasting purposes, and can only say that Mr. Robertson has recorded very well indeed upon his plates some extremely difficult scenes.

For some years Mr. Douglas English has been known as an ardent photographer of natural history specimens, and the fact that he has this year received a medal for a series of six frames of twenty-two prints of the common rat, mouse, and vole may be taken as sufficient evidence that his work is of a high order of merit. He has systematically endeavoured to show typical front and side views of the creatures, and very well indeed has he performed his task. The award may be taken as a recognition, not only of the exhibits themselves, but of previous work that has often received favourable notice at the hands of those who know the difficulties besetting the photographing of such forms of life as those he has so perseveringly handled.

The application of photography to microscopy is strongly, but very scantily, illustrated in the present Exhibition. There seem to be but two frames of specimens, and these are by Mr. Thomas E. Freshwater, F.R.M.S., whom we recognise as a painstaking and particular investigator with the camera in conjunction with the microscope. He shows some large direct photo-micrographs from various geological specimens that will commend themselves to all who practise in this field of research.

The war and its horrors is forcibly brought home to us by Mr. Hall-Edwards' series of radiographs taken at the Imperial Yeomanry Hospitals at Deelfontein and Pretoria, the terrible power of the expansive bullet, shrapnel shell, and the Mauser rifle being too clearly indicated by the numerous pictures of fractured bones. Mr. Hall-Edwards has only recently returned from the seat of war, bringing with him these testimonies to his work, upon which he has our congratulations.

The six prints sent in by Captain Wilson-Barker, of H.M.S. "Worcester," are from a very extensive series of cloud studies. For many years the exhibitor has devoted constant attention to the question of cloud formation, and in the photographs on view he gives typical representations of cirrus clouds, shower and squall cumulus, high stratus, mackerel, sky, etc. We do not imagine that the pictorially minded photographer in search of clouds for printing in will cast covetous eyes on these prints, but as simple records of what they purport to be they are extremely good.

Dr. Vaughan Cornish has a particularly interesting exhibit exemplifying one of the directions in which photography may be of service to the scientist. He has been making a careful and close study of wave motions in solids and liquids during journeys in many parts of the world. The effects are very striking, waves in sand, in snow, in foam, and other bodies produced by wind and tide pulsations being shown.

There is a collection of twelve photographs of Prize Oaks, sent by Mr. J. A. Farrer, who has published a book in four volumes containing some fifty specimens. Whether viewed as pictures or as types of oaks, the series speaks of an amount of skill and perception on the part the exhibitor which we are glad to acknowledge.

The President of the Society, Mr. Thomas R. Dallmeyer, has an exhibit of some interest, marking as it does the daily progress of a drawing in coloured crayons by Mr. Frederick Sandys from first to last. Needless to say, photography has been the means of recording the progress made.

Mr. W. L. Bourke, the exhibitor of 399—405, has been making a specially close study of orthochromatic photography for the more perfect reproduction of old paintings, etc., and in the prints shown he has several copies of originals in the Bridgewater collection and in the possession of his Grace the Duke of Westminster, which deserve examination. A little farther along we come to some work by Mr. Alfred Watkins illustrating the method of timed development as applied to negatives and bromide prints. Six different brands of plates—slow, medium, and fast—were taken and developed for five times the appearance of the image. The results are singularly alike both in the negatives and the bromide prints, the latter being developed for four times the appearance of the image.

Mr. J. Hort Player, whose name will be remembered as that of one who made copies of engravings, etc., by what he called the absorption process, the bromide paper being exposed between the light and the original engraving, shows half a dozen bromide copies old engravings, but it is not clear whether they are by the ordinary method or by the method which we have outlined above.

Dr. J. M. Eder and Herr Valenta have several exhibits that are worthy of more notice than can here be given. Briefly, they are a series of spectrum analyses of argon, iron, etc.; prints showing the colour sensitiveness of gelatino-bromide of silver; photography applied to the study of tree life and growth, and some experimental results with Röntgen rays. They all show the thoroughness with which these two Continental savants enter upon their investigations.

The snow-clad peaks of the Himalayas, by Prof. E. J. Garwood, the well-known mountaineer, as seen in No. 445, form an excellent example of what can be done in a difficult country. His panorama of the Bernina range, in Switzerland, is also a fine piece of work. Both are carbons considerably enlarged. In the same category come Mr. Bagot Molesworth's tele-photographs, taken at distances of upwards of ten miles in the neighbourhood of the Lauterbrunnen Valley, although not so good as some earlier work of his that we have seen. Mrs. Aubrey Le Blond has some of her mountaineering views, but these again are not up to her best form.

We cannot conclude our notice without allusion to the exhibits sent by M. Henri Becquerel. They deal with the Zeeman phenomenon, and with the radiation of radio-active bodies, and the influence of magnetic and electrical fields. Mr. H. C. Rapson has a frame of prints produced by printing through various leaves—lilac, poplar, rose, cherry, apple, etc.—in contact with the gelatino-chloride paper. In these pages reference has been already made to the fact that such prints showed evidences of colour in different parts. The background, for instance, was bronzed, the parts where the leaf intervened were green, saving only the tips and edges and vein marks, where distinct colour effects were apparent. The phenomenon is one that requires more investigation than has at present been bestowed upon it.

Mr. E. Scamell has a balloon view over Aylesford from an altitude of 2500 feet that we are glad to see; and with the camera turned the other way Mr. J. Milton Offord, has secured some excellent photographs of the Milky Way. Professor Ludwig von Jan, of Strassburg, has a collection of carbon studies, including flowers, fruit, book illustrations, and nude figures. Some of the pigments are very vivid in colouring, but the subjects are treated, on the whole, in a pleasing and sometimes fresh manner.

Of apparatus there is but little, and it seems that the inauguration of the separate stall system for the display of apparatus has rather drawn attention from the competitive section. There is a new portable lantern screen, sent by Mr. Edwin Guest. The sheet is mounted on a stout umbrella-like frame, by which it is stretched, and is supported in use upon a bamboo stand that screws into the floor. The European Blair Camera Company exhibit their daylight loading film cartridge, in which a new process of packing has been adopted. The sensitive film as it is rolled comes only in contact with a perfectly innocuous white paper, through which are perforated numbers and dividing marks which allow the black underlying paper to show through. Messrs. Sanger Shepherd and Company have on view the Chapman Jones plate tester, which has been but recently fully described in this JOURNAL. Suffice it to say that it is a simple improved and combined method of testing plates, papers, and films.

Two cameras only figure in this section, viz., Geo. Houghton and Son's 1902 model Sanderson de Luxe hand camera, embodying three new patents, i.e., improved front, body, and infinity catch; and Sanders and Crowhurst's journalist's camera. The latter is furnished with an improved finder, having an eyepiece on a folding arm, and a vernier, by which the movement of the rising front can be followed, and the object to be photographed kept always on the plate. The changing mechanism is rapid, and carries twelve sheaths for plates or films. It appears to be a French camera of Bellieni's make.

The Slides.

Somehow we have become accustomed to expect no brilliant show of slides at the Royal Photographic Society's Exhibitions. We do not think that it can be attributed to any falling off in the production of good work, but certainly the best things do not reach the New Gallery. Amongst the exhibitors are Mr. S. J. Beckett, Mr. W. Reid, Mr. Graystone Bird, Mr. Ralph R. Rawkins, Mr. Frank W. Gregg, Mr. Harry Wade, Mr. Oliver Pike, Mr. B. H. Bentley, Mr. Eustace Young, Mr. George Hankins, Mr. H. T. Malby, and Mr. R. A. Malby. The work includes good average slides of architectural, woodland, winter and bird studies. There are more slides this year by the Sanger Shepherd process of colour photography. Miss Acland, of Oxford, sends six slides of various subjects that speak well for her grasp of the details of this process. Mr. John Allen's set of Swiss scenes is not so good; his exposures do not seem to have been correctly gauged, or the staining operations have not been successfully coped with. Mr. Charles B. Howdill, A.R.I.B.A., of Leeds, has eight slides of stained glass windows taken at Oxford during this year's Convention meeting. It seems unnecessary to enter into details of the several windows depicted, concerning ourselves, as we are, merely with the photographic operations. Mr. W. E. Bond has fruit and china studies and some crystals by polarised light that seem very good. By the same process Mr. Andrew Pringle's fifteen slides strike us as very well done. They include flower and other subjects and various crystals as seen by polarised light. Messrs. Sanger Shepherd and Company themselves send eight slides, of which the sky at sunset studies are by Mr. James Cadett. The others are reproductions of paintings. On the whole, this colour work is very gratifying and creditable to those concerned, and not the least, though last, are the Lumière three-colour stereoscopic slides sent by the Lumière N. A. Company, Ltd., although the relief in some instances seems somewhat exaggerated. The last of the exhibits that we have to mention is General Lloyd's set of ten stereoscopic transparencies. If a few more like him would lend a helping hand stereoscopic photography might be popularised once more. That it is a beautiful method of representing natural objects no one can deny, but that it has but a very weak hold upon present-day photographers is a fact we are extremely loth to chronicle.

THE FOREIGN INVASION AT THE SALON.

A glance at the catalogue of the Photographic Salon this year reveals some significant figures, and also prompts a few curious questions. The list of the General Committee numbers some 64 names in all. Of these we may put down 38 as residents in Great Britain, leaving a balance of 26 foreign members—approximately in the ratio of 3 to 2. Looking for these 64 names in the index of exhibitors w ..nd that only 36 are showing this year; *i.e.*, nearly one-half are not represented. One cannot help wondering what has happened to the other half? Taking the index of exhibitors, it is interesting to sort them out according to the addresses given—with two exceptions, viz., placing Mr. Shapoor Bedwar as India, and Mr. E. J. Steichen among the American contingent, although he this year gives a Paris address.

We have three chief groups, viz., *Great Britain, Continent* (chiefly Paris and Vienna), and *America*.

The subjoined table shows at a glance the number of exhibitors, exhibits, and average number of frames per name.

Exhibitors.			Frames.		Average.
Great Britain	63		136		2·1
Continent	13		43		3·3
America	34	49	148	104	3·0
India	1			1	1·0
Totals	111		284		2.5

Thus we see at once that *the foreign exhibits outnumber those from home workers* in the proportion of 148 to 136, say, in the ratio of 12 to 11. Observe also that the home contributors, while outnumbering the foreigners 63 to 49 (say 5 to 4), have the smallest average, the former showing 2 frames each, the Americans showing 3 each, and the Continental members having, say, 3⅓ each. In the same way we may analyse last year's catalogue thus:—

Exhibitors.			Frames.		Average.
Great Britain	72		146		2·0
Continent	4	33	93	22	5.5
America	29			71	2·4
Totals	105		239		2·3

Hence we see that from last year to this the number of frames has increased from 239 to 284. Supposing the increase to go on at the same rate, next year we ought to have 330 frames. Again, last year 93 of the 239 exhibits were foreign. This year 148 out of 284 are foreign. And suppose this increase of the foreign invasion to go on. Then next year we ought to have 220 foreign and 110 home-grown pictures. These prophecies are, of course, made on the assumption that the Salon authorities will act according to previous years, observing the same ratio and modulus of increase. But it may be that, like our friend, N. E. Cessity, they "know no law."

It so happens that the Salon catalogue for 1896 is the earliest one on hand. Glancing through the General Committee of that year, and comparing it with this year, we note the following names which are to be found in '96 are not to be found in 1901, viz.—L. C. Bennett, J. S. Bergheim, V. Blanchard, R. Bryant, T. M. Brownrigg, F. Cobb (d.), H. E. Davis, S. Day, G. H. James, F. C. Lambert, A. Leibig, H. P. Robinson (d.), N. de Rothschild, B. G. Wilkinson. In all, fourteen out of a list of sixty-one are "out." Of these, Cobb and Robinson are dead. But what of the remaining twelve; have they been expunged or voluntarily retired?

It is well-known that membership is only obtainable by the unanimous invitation of the existing links. Can it be that these twelve "missing links" have resigned? If so, is it because they were not quite satisfied with the dry motto "Liberty and loyalty," and would have liked to have included a little flavour of "equality" in the dish?

It is common talk that "over eight hundred frames" were "chucked" this year—a statement which seems to have afforded profound joy to those who did the chucking. But the "chuckee" may view matters in another light. Supposing in all some 1100 frames are selected in a probable period of perhaps eight hours or less. This is at the rate of about half a minute each. At this rate it is quite credible that "fortune fights with merit," and as likely as not chance outweighs merit in a full half the cases. Bearing these things in mind, and the teaching of the foreign invasion above indicated, the contemplative man will possibly take pause and consider whether the game is worth the candle, especially when he receives back his frames, a sorry wreck of their pristine beauty:

"All that was left of them,
Left of eight hundred."

Britisher.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION: MEETING AT EDINBURGH.

At a largely attended meeting in Mr. Moffat's studio, Edinburgh, on Monday, September 30, the first branch of the P.P.A. in Scotland was safely launched.

Mr. Moffat gave a short address, pointing out the great benefit such an association as the P.P.A. will be to professional photographers, and in the course of which he referred to the copyright of photographs, fire insurance, cost of materials, &c. He said the object of the branches is to keep every photographer in touch with, and to give them a real interest and direct voice in, this very necessary association.

Mr. Crooke urged every photographer to join the Association, and made a strong appeal to all present to do their utmost to influence their friends in the direction of unity. He touched on the Copyright Act, and said it was of the greatest importance that we should have some one in Parliamentary circles to carefully watch, in the interests of photographers, Lord Monkswell's new Copyright Bill.

Mr. Patrick said there must be no half-heartedness. All photographers must unite together to defend their own rights.

Mr. Balmain asked the Chairman if it was intended to allow dealers to become members.

Mr. Moffat replied in the negative, and after due discussion, in which Messrs. Crooke, Heaven, Yerbury, Inglis, and Patrick took part, it was decided unanimously that it would be advisable to restrict membership to professional photographers.

The Edinburgh Branch of the P.P.A. was then duly formed, with Mr. W. Crooke, Chairman; Mr. F. P. Moffat, Hon. Secretary; and Mr. J. C. H. Balmain, Treasurer.

Mr. Moffat proposed that this Branch should meet five times a year, to take place a week before the London meetings, so that, if there were any matter they desired to submit to the parent body, it could be brought up in London on the following week.

The next meeting of the Edinburgh branch of the Association takes place on Friday, November 29, 1901.

The following names were handed to the Secretary as proposed new members of the Professional Photographers' Association:—

J. C. H. Balmain, 69, Shandwick-place, Edinburgh.
— Banks (Manager for A. Ayton), 42, Bruntsfield-place, Edinburgh.
Durie Cooper, 18, Newington-road, Edinburgh.
Frank Inglis, Rock House, Calton-hill, Edinburgh.
Johnston Kelly, 112, Ferry-road, Leith.
T. Polson Lugton, 14, East Mayfield, Edinburgh.
R. A. Heaven, Blenheim House, Blenheim-place, Edinburgh.
J. McKean, 15, Ferry-road, Leith.
James Patrick, 75, Comiston-road, Edinburgh.
Thos. Pursey, 2, South Charlotte-street, Edinburgh.
Charles Ross, 16, St. Bernard's-row, Edinburgh.
E. R. Yerbury, 1, Hanover-street, Edinburgh.
J. Drummond Shiels, 70, Lauriston-place, Edinburgh.
J. Crawford, 233, High-street, Portobello.
W. Halkett, 180, High-street, Portobello.
Alexander Walker Robertson, New Century Studio, 5A and 5B, High-street, Kirkcaldy.

ON CIRCULATING PORTFOLIOS.

NEARLY every photographic society of any professed importance has its one or more circulating portfolios nowadays, an ingenious device whereby each member hopes to find out what the others think of his attempts at the pictorial, and has an opportunity, in his turn, of mercilessly criticising the pet productions of his fellow-members. The plan is often productive of great mutual benefit, that is to say when the fundamental idea of the giving of sound and well-thought-out advice is loyally and sympathetically carried out. On the other hand, it is quite within the power of a few photographic "know-alls" of a carping and cynical spirit to introduce innumerable bones of contention, by means of ill-advised remarks in the portfolio, and to turn the erstwhile happy family into a veritable bear-garden, till the unlucky collection of caustic and irritating comments is abandoned in disgust.

There is a good deal of truth in the old saying that he who asks advice really desires praise. It is a rare mind that can receive unpalatable truths without any feeling of annoyance.

For the generality of human beings they require to be presented in their least repellent form, that is to say, as gracefully and softly expressed as truth and candour will permit. This is a piece of practical wisdom that should be borne in mind when giving an opinion on photographs in a portfolio or elsewhere.

The comments in such a circulating collection will very often bear striking and amusing witness to the strong tendency of critics to follow a lead, and echo faithfully the dictum of some one else, rather than give voice to original and creative ideas of their own. We had the pleasure of looking over the portfolio of a rising society, a few days ago, and thought a few of the observations therein were, for sheer unconscious humour, well worth making a note of. Here is an example:—Some one had contributed a rather picturesque evening scene of the ebb-tide description—a nice little carbon print—and whether from lack of time or the idea of merely rough-mounting it, had left the edges rather unsymmetrical. Critic No. 1 straightway pounces on this fairly obvious fact, and, with all the severity of indignant and offended virtue, sums up his judgment of the erring picture thus laconically: "Badly trimmed." Critic No. 2—probably struck with such an important and momentous discovery—echoes his predecessor's voice, "Yes, badly trimmed." And, comically enough, no fewer than three others in succession make the same remark, before it dawns upon the sixth that the multiplication of dogmatic pronouncements of this kind is not exactly the purpose for which the undertaking was intended. This is by no means an extreme instance. In quite a large proportion of cases it may be assumed, for what psychical reason is difficult to say, that the verdict of the first one is almost sure to be more or less supported and upheld by those who follow him. So much is this so, that we have known proposals made, and in one or two instances carried out, that all the criticisms should be placed in sealed envelopes, as the portfolio circulated, so that each member would be unaware of the judgment of the others, until all had contributed their opinions. This plan certainly secures greater originality and fairness in the remarks passed on the prints, but has also its disadvantages. It tends to the development of excessive caution in the ventilating of ideas, and the withholding of valuable comments, because their originator is afraid they may be peculiar to himself, and dissented from by all the rest. Certainly, also, one of the greatest attractions of the portfolio system is the looking at the pictures with other eyes, as it were, and watching the lines of comment gradually grow in space and interest, as each contributor adds his quota to the whole. Then, too, there are such favourable opportunities for spirited encounter and contradiction when one of the critics expresses views debateable or untenable. On the whole, the advantages of the open criticism seem to outweigh its defects and weaknesses. There is far more of human interest and vitality about the former method than when the sealed plan is adopted. Many, indeed, are of opinion that members of photographic societies take even more pleasure in the study and examination of the slowly multiplying criticisms—"the carnival-shower of questions and replies and comments," as Oliver Wendell Holmes says somewhere—than in the pictures themselves.

The adoption of a circulating portfolio has often a pronounced effect in the direction of improving the general level of work done by the members of a society. The plan of bringing up prints to the meetings, to be orally criticised by the assemblage of photographic talent, although good in its way, is not to be compared with the former. For one thing, it would seem that we are generally gentler and more diplomatic in discussing anything to its producer's face, from easily understood and commendable habits of courtesy; this, of course, robs such expressions of opinion of half their value as regarded in an instructive light. In the portfolios, on the other hand, it seems to be accepted as the whole duty of man to be as outspoken as possible. The way of improvement and progress is pointed out, if one read between the lines and arrive at their aggregate meaning and significance, in an unmistakable and helpful manner. It is inevitable, of course, that there should be an occasional confusing difference of judgment and expression of opposite views on the same print, but, generally speaking, the vox populi in photographic matters is rather more reliable than it is in some other things.

The keeping of such a portfolio is a valuable agency for the inculcation of neatness and care. The first time it goes round, perhaps, the necessity of such virtues is not sufficiently obvious, and the covering sheets on which the criticisms are written become woefully crumpled and dirty. No particular trouble is taken to secure anything approaching uniformity of writing; some use pencil, which, before it reaches the sixth or seventh subscriber, becomes faint and illegible, others employ various more or less execrable apologies for ink, and distribute splashes of the same where it is not wanted. The second, or it may be the third time, the portfolio issues forth on its mission, all concerned have become thoroughly ashamed of the soiled and reprehensible state in which they last remember it, and the lesson has been learnt. Henceforth spotless neatness and fair black writing are the sine quâ non. It soon becomes evident, also, that heavy and thick mounts are unsuitable for the purpose, and thin dainty sheets of tinted cartridge or drawing paper, or the lightest of boards, are adopted.

It is a question of some depth which is the most profitable, the placing of one's best work in the portfolio for criticism, or the displaying of that which is only second-rate. There are some who uniformly act on the first idea, while others, perhaps the majority, seem, intentionally or otherwise, to prefer the latter. It may be said in favour of the laying of one's best on the altar of the fault-finder, that it has a wonderful effect in opening our eyes to hitherto unknown and unsuspected flaws in our work, and, if it is rather discouraging, is at least calculated to raise our standard, and, if a paradoxical expression be allowed, make us do better than our best. It is true, to be sure, that what we ourselves consider our most meritorious performances are not perhaps viewed in the same light by others, who, it may be, admire the very things of which we think the least and have the smallest opinion. The displaying of our inferior work is, on the other hand, however, the most likely to have the effect of ridding us of our more palpable and glaring faults, and levelling up our ideal from below, although it may not lead us to such lofty flights as when we sternly and determinedly place our most cherished creations in the censor's line of fire.

It is no doubt more generous, and shows more concern for the general progress to give of our best unstintedly, and always reacts to our own advantage, by inducing others to follow suit, so affording us a larger and higher scope for our study and imitation. After all, we never go forward until we learn the great lesson of absorbing

and retaining all that is most commendable and praiseworthy in the work of others. As Sir Joshua Reynolds wisely observes:—"The addition of other men's judgment is so far from weakening our own, as is the opinion of many, that it will fashion and consolidate those ideas of excellence which lay in embryo—feeble, ill-shaped, and confused. . . . Those, who from their own engagements and hurry of business, or from indolence, or from conceit and vanity, have neglected looking out of themselves, as far as my experience and observation reaches, have from that time, not only ceased to advance, and improve in their performances, but have gone backward. They may be compared to men who have lived upon their principal till they are reduced to beggary and left without resources."

THE LARGEST CAMERA IN THE WORLD.

We are indebted to a New York friend for the following description of what is claimed to be the largest camera in the world. Many brief references to this instrument have been made in the newspapers. This official account will probably interest those of our readers who may have formed reasonable doubts as to the existence of such a vast camera:—"During the summer of 1899, the workmen at the Pullman Works, at Pullman, Ill., were busy building two trains, the plans for which differed materially from anything which they had hitherto worked upon. Like all work done in separate departments of a great manufactory, and then assembled and put together, it required the ensemble to demonstrate whether or not the trains would surpass anything which had heretofore been constructed. One afternoon in November the first completed car was wheeled out of the workshop and placed upon the storage trucks; later in the day another made its appearance, and during the succeeding week there rapidly followed ten more cars which, with the first two, were made up into two complete trains of six cars each. Engines were attached, and the manager of the works, his master craftsman, and, practically every workman in the shops turned out to witness the departure from Pullman of the 'Alton, Limited,' to go into fast daylight service between Chicago and St. Louis on the Chicago and Alton Railway. Thousands of cars and trains have been built at Pullman—from the equipment of little narrow gauge lines to luxurious private cars. At Pullman rolling palaces have been built for the rulers of the greatest nations of the earth, and equipment for display at international expositions has been constructed. Yet no trains which ever left the works attracted so much attention and elicited so marked a degree of approbation from the workmen-critics as the Alton, Limited. This was because no railway train in the world had ever presented so uniform and symmetrical design. No train of cars had ever before been built with windows of the same size, shape, and style from mail car to parlour car; the cars in no train heretofore had all been mounted on standard six-wheel trucks; no former effort had been made to have every car in the train precisely the same length and height; and no railway, except the Alton Road, had ever caused the tender of its locomotives to be constructed to rise to the exact height of the body of the cars following; the hood of its locomotives to the exact height of the roofs of the cars. This gave a fascinating beauty to the train—carrying out the principal features with classic regularity—the absolute unity of detail from cow-catcher to observation platform. Indeed this was what created, and impelled, the idea to obtain a photograph of the 'Limited' sufficiently large to readily impress the public with the train's uniform conformation.

"Mr. George R. Lawrence, the Chicago and Alton's photographer, who had previously taken some very large photographs of the 'Alton's' new standard passenger locomotives, was called into conference. The Chicago and Alton had built a faultless train of which they demanded a faultless photograph, insisting that in length the picture must not measure less than eight feet. It took 2½ months to build the big camera, in regard to which the following data will prove interesting:—The mammoth camera was designed and built in Chicago. It is finished throughout in natural cherry, and at the top of the back part of the camera is a small track upon which two focussing screens are moved back and forth like a sliding door. These focussing screens are made of semi-transparent celluloid stretched across the frames. The bed, which is composed of four 2×6 in. cherry beams, is about twenty feet long when fully extended. The camera has double swing front and back. The bellows is made of an outside covering of heavy rubber, each fold being stiffened by a piece of veneered whitewood one-fourth of an inch thick it is then lined inside by a heavy black canvas and an additional lining of thin black opaque material, thereby making it doubly light proof. In the construction of this mammoth bellows over forty gallons of cement, two bolts of wide rubber cloth, and five hundred feet of one-fourth inch whitewood were used. The bellows is divided into four sections, and between each section is a supporting frame mounted on small wheels, which run on a steel track; the back, supporting the plate-holder, being operated as easily as an ordinary camera. The plate-holder is of the roller-curtain type. This curtain contains about eighty square feet of ash three-eighths inch thick, and is lined with three thicknesses of light-proof material. Over ten gallons of cement were used in the construction of this curtain, and it is mounted on a ball-bearing roller. Ball-bearing rollers are also mounted every two inches in the grooves in which the edge of curtain slides, thereby reducing the friction to almost nothing. The weight of the camera is 900 pounds, and the plate-holder, when loaded, weighs 500, making a total weight of 1400 pounds.

In operation the camera is so constructed that after a long journey the plate may be dusted in a very unique manner. The holder is put in position, the large front board, or front door, as it may be called, is swung open, the operator passes inside with a camel's hair duster, the door is then closed and a ruby glass cap placed over the lens, the curtain slide is drawn, and the operator dusts the plate in a portable dark room, after which the slide is closed and he passes out in the same way as he entered. The lenses are of the Carl Zeiss patent. They are the largest photographic lenses ever made, one being a wide-angle lens five and a half feet equivalent focus, and the other being a rectilinear lens of ten feet equivalent focus.

Our Editorial Table.

Samples of Carbon Tissues.

Manufactured by Thomas Illingworth & Co., The Photographic Works, Willesden Junction, N.W.

At no time since the carbon process was first introduced, now some seven and thirty years ago, has it been worked so largely as it is at the present time, and consequently the production of the material is increasing, and new manufacturers are entering the field. The latest are Messrs. Thomas Illingworth and Co., of Willesden Junction. From this firm we have received samples of their tissues, transfer papers, and temporary support. The colours of the tissues sent were "Standard brown," "Standard purple," "Green," "Sepia," "Warm black," and "Willesden sea green." We found on trying them that the tissues worked satisfactorily, holding the delicate tints in the lights well. The colours were excellent, and the pigments were in a very fine state of division. The transfer papers, both single and double, are of various grades of surface, and of different tints, and appear to be very evenly coated. The temporary support we found to have a very even surface, and was carefully prepared. In a letter accompanying the samples Messrs. Illingworth mention that they have a series of fifty-two different coloured tissues, and are constantly adding to the number. If, from the present number even, photographers cannot select one to their taste they must, we think, be very difficult to please.

Supplementary List of Life Model Lantern Slides.

Published by James Bamforth, Station-road, Holmfirth, Yorkshire.

For the season 1901-1902 Mr. Bamforth has issued a supplementary list of lantern slides made from negatives obtained in his famous life-model studio. Several minute illustrations give an idea of the nature of these glass transparencies, which in many cases rely on sentiment for their effect, and therefore are tolerably sure to "go down" with popular audiences and in the home circle. The following extracts from an article in "Harmsworth's Magazine" convey an idea of the manner in which Mr. Bamforth's studio is utilised for the production of his effects:—"A large well-lighted room, some thirty feet long, forms the studio where most of the model life groups are photographed. This room in its time has played many parts. One day it may be a church, another a sumptuous ballroom, then a prison cell, and next a wretched, poverty-stricken garret. Again it will serve as the quarter-deck of a ship, the interior of a signal-box, or the bar of a flaming gin-palace. These transformations are brought about partly by Mr. Bamforth's skill in scene painting and partly by the presence of a collection of properties which would do credit to many a theatre. As a general rule, the background of the scene is a painting, while the foreground is built up of models or 'properties.' These are of the most varied and comprehensive character, and occupy a number of large store-rooms. In one corner may be seen a pile of wretched furniture of the most squalid character, serving well for depicting the miserable home of a drunkard. This kind of thing is often wanted, as lantern slides are largely used to illustrate temperance lectures. A complete set of model signal-levers and telegraph instruments serves to make up an admirable railway signal-box, and this has done yeoman service in illustrating more than one well-known story. Quite lately that exceedingly popular story, "In His Steps," has thus been illustrated for lantern purposes. In this case a photograph was taken in an actual chapel, as it was necessary to have a minister in the pulpit and singers in the choir gallery. The crowded congregation consisted of people living in the neighbourhood. In this connection

it is often thought that the models must be actors of considerable power, seeing the varied emotions that are expressed so strongly on their faces. But this is by no means the case. The models are simply Mr. Bamforth's neighbours, who take a great interest in his work, and are generally willing to sit. Of course, the photographer selects as far as possible persons whose faces readily lend themselves to the expression of the emotion or character desired. Thus it has happened that some of his bold, bad villains have been really most respectable and law-abiding townsmen, while some of the awful drunkards have been in private life the most sober of men. At the same time it must be admitted that the tap-room of the local public-house has afforded some excellent models."

Stereoscopic Views in South Africa.

Published by William Tylar, 41, High-street, Aston, Birmingham.

We have been glad to receive a specimen set of stereoscopic views taken on the South African battlefields. Mr. Tylar informs us that the negatives were obtained with some difficulty owing to the distances to be travelled. An examination of the views shows them to have been carefully prepared, and we can recommend them to those of our readers desirous of possessing reminders, in binocular form, of some of the scenes of the unhappy war that is still in progress.

The "B.P." Universal Combination Key.

Manufactured and sold by the Scotch and Irish Oxygen Company, Rosehill Works, Polmadie, Glasgow.

A year ago when we noticed this ingenious combination key the Scotch and Irish Oxygen Company were not able to supply it, the stampers having disappointed them with delivery. However, a stock is now in hand, and we again have the opportunity of bringing the key to the notice of lantern operators. The specimen before us weighs about 1¼ lb., and is of stamped steel, case hardened throughout; a reversible adapter union of gun metal is also supplied. The uses of the key are many. It is at once wing nut lever, lime cleaner, lime tongs, hammer, and screw driver; while it can be applied to the gland nuts and spindles of the Manchester, Birmingham, Brins, and the Scotch and Irish Company's cylinders; the reversible adapter union also admits of a similar variety of uses. The key is so easy to handle, and so compactly made, that we can quite imagine an operator at the optical lantern who may not wish to be burdened with too many tools will welcome such a handy and cleverly designed piece of apparatus. It is about ten inches long and three broad at the wider end.

The "Ideal" Optical Specialities.

Sole wholesale agents: O. Sichel & Co., 52, Bunhill-row, E.C.

Messrs. Sichel ask us to announce that they have been appointed sole wholesale agents for the following productions of Messrs. Burke and James, of Chicago:—The Ideal Enlarging and Copying Lenses.—These lenses are used in conjunction with the lenses of any camera that will permit their attachment. The lens can be attached or detached in an instant. They are simply slipped over the head of the lens, and are held in place and optically centred by three springs. The Ideal Portrait Lens: This lens is made on the same principle as the enlarging and copying lens, only it is specially adapted for portraiture. The Ideal Ray Filter: The Ideal Ray Filter is composed of two discs of optical glass, ground optically plane, each coated with a yellow film, spectroscopically tested and firmly cemented together. The Ideal Duplicator: By attaching this instrument to the lens of any folding camera, any person or persons can be photographed in two positions on the same plate, without showing any division line where the two exposures meet on the plate. Many humorous pictures can be obtained in this way. Two persons can be photographed together in a group without either one having seen the other. The Ideal Wide-angle Lens: This lens is applied to the camera in the usual way, and is used as a regular wide-angle lens; it should be stopped down to about f-22 for general work. The Ideal Tele-photo Lens. The Ideal Photo Optical Outfit: A complete set of the four Ideal supplementary lenses, ray filter, and duplicator, specified above, for any quarter-plate, 5×4, half-plate, or 7×5 camera.

Studio Gossip.

The St. Louis Exhibition of 1903.—Mr. J. C. Strauss of St. Louis writes: "Your kind favour of the fourth inst. is much appreciated and am indeed pleased to learn you are reprinting the description of my studio; I believe that if you honour me with a call in 1903 you will find the words warranted by facts. We are working hard to get a separate building at our World's Fair, and I hope will succeed. If the European photographic journals would evince an interest in this enterprise I am confident they would exert a great influence. I am grateful that your journal, also the 'Photogram,' have devoted editorial space to the subject."

Photography and Modern Illustration.—"Perhaps the most notable development in the art world which the last generation has witnessed is that associated with the reproduction of pictures. Colour-printing, a comparatively new branch of art, has, in various forms, made such wonderful strides that one can now obtain for a few shillings copies of works of great masters, so accurately coloured and artistically produced as to be actually superior in many respects to the general run of reproductions painted by hand. The evolution of the photographic camera," writes the "Morning Post," "has produced an even greater artistic revolution than the advent and advance of the colour printer. There are some who still declaim art photography as a 'spurious art,' even if they consent to honour it by the name of art at all, and those class the photographer, professional or otherwise, among the Philistines. We have no desire to rake up the embers of controversial fires, now almost extinct, and we shall not insist too much on the perfection of later photographic methods. It is clear, however, that the use of photography in connection with the reproduction of black and white work has received an enormous impetus in recent years. One has only to look through the modern books and magazines on a library table to realise how largely the publisher of to-day avails himself of the camera for illustrative purposes; while a glance at the window of any print-seller's shop will show the extent to which photography has also invaded a somewhat higher branch of art. We are told on the authority of Mr. Adolph Tuck, the managing director of Messrs. Raphael Tuck and Sons, Ltd., that artists, as a rule, prefer to have their pictures reproduced by means of the modern process known as photogravure rather than through the medium of steel engraving or etching. The reason put forward is—and here we have a practical reply to the 'spurious art' theory—that they are more likely to get a faithful rendering of their work by that process. There have been, and are, engravers who are fine artists, but such men are few and far between, and most painters would rather have good photogravures of their pictures than inferior engravings or etchings. Of course, there will always be a demand for good artistic work, whether produced by the engraver or by any other instrument. It depends on the artists to decide whether such work shall be forthcoming. The collecting instinct shows no signs of disappearance, and to the average collector the fact that the number of copies of a particular etching or engraving is strictly limited imparts a higher value than is given by artistic merits alone. The remarkable prices obtained for rare engravings at sales which have taken place within the past few months make it evident that the market for this class of work is still a good one, and that it is yet too early for the lover of engraving to begin to compose epitaphs on the object of his affection. On the other hand, it is pretty obvious that photogravure has 'come to stay'; the process is quicker than that of either engraving or etching, and there is practically no limit to the number of copies that can be produced. As to wood engraving, one sometimes hears the mournful pronouncement that, outside 'Mr. Punch's' genial domain, it is becoming a lost art. Of course, this is not quite the case, though much of the work which used to be done by woodcuts is now accomplished by photographic processes. Certain classes of illustrations, however, could not at present be produced by any other means, and wood-blocks are still used in considerable numbers for catalogues and other purposes.

News and Notes.

Photographic Club.—Wednesday, October 9, at eight o'clock, at Anderton's Hotel, the Rev. John M. Bacon, M.A., F.R.S., "By Land and Sky, the Record of a Balloonist." Visitors are cordially invited.

The Traill Taylor Memorial Lecture.—The title of the fourth annual Traill Taylor Memorial Lecture, to be delivered by Professor Sylvanus P. Thompson on October 23, is "Zonal Aberration and its Consequences."

The Royal Photographic Society will commence its new session with an ordinary meeting on Tuesday, October 8, at the New Gallery, 121, Regent-street, at eight p.m., when the President will present the medals awarded at the current Exhibition, and read his annual address.

Mr. Edgar S. Barralet, the inventor of the British Developing Agent "Synthol," is arranging dates to lecture upon this novelty before the Photographic Societies and Clubs of London and District. Secretaries desirous of securing his services should write as soon as possible to Edgar S. Barralet, c/o Messrs. Wm. Burton & Sons, Bethnal Green, London, N.E.

Mr. Arthur C. Baldwin, one of the representatives of the Paget Prize Plate Company, has been re-elected Chairman of the Fulham Camera Club, and Mr. Franklin T. Barrett and Mr. Littleboy in their former positions of Vice-Chairman and Hon. Secretary. On October 9 Mr. Baldwin delivers his address to members, and on October 23 Mr. Essenhigh Cooke, of Sevenoaks, is to give a lecture on Knole House, illustrated with over ninety lantern views. The subscription remains as before, viz., 5s. per annum. The meeting on October 9 will be held at 592, Fulham-road; on the 23rd at the Fulham Conservative Club (large hall).

A novel use is to be made of the kinematograph by the Blackpool people—they intend to use it as a means of making their pleasure-providing town even better known than it is already. The advertising committee have decided to spend a large sum on kinematograph films, and a series of pictures has already been taken, from the top of a

tramcar as a vantage point, which portray the crowded promenade and piers, and the heavy breaking seas for which Blackpool is so famous. The pictures will be shown at the Blackpool Tower, and then sent all over the country. Some of our southern watering places might do worse than take a leaf out of the Blackpool municipal note-book, for the charms of a watering place are forced upon one when the spontaneity of life is added to what natural picturesqueness they may possess.—"Invention."

"TAKE Care" was the subject of the first lecture in connection with the newly formed Blackburn and District Photographic Society, which was given last Tuesday evening by Mr. E. S. Bellingham. The lecturer, in the course of his remarks, offered some valuable advice to photographers, and specially to beginners, with regard to the selection of a lens, camera, and other apparatus, and as to plates, dark room, developers, etc., while the more advanced workers greatly benefited by many useful hints which he gave. The meeting afterwards discussed the suggestion of a room for the entire use of the Society, to which a dark room could be attached, but eventually the matter was left over for the present. The Society has now 105 members. Persons wishing to join should give in their names to the Hon. Secretary, Mr. W. Duxbury, 7, Queen's-place, Gawthorpe, Duke's Brow, Blackburn. The syllabus for the winter session will be issued in the course of a week or two. The next lecture will be given by the President, Mr. R. Wolstenholme, on "Carbon Printing," on Tuesday, October 8.

PHOTOGRAPHY at High Altitudes.—The Hon. C. S. Rolls and his balloon party, consisting of Mr. Frank Butler and Miss Butler and Mr. Stanley Spencer, decided to take advantage of the fine weather, and made their projected ascent in the new aerostat, City of York, at 3.45 on Tuesday afternoon last week from the Crystal Palace grounds. The balloon was taken by a very gentle breeze in a north-westerly direction, and remained in sight for a long time, the stillness of the air affording the aeronauts ample opportunity for making the desired photographic experiments at various altitudes. After an altitude of two thousand feet had been reached, a curious counter current was met with, which caused the aerostat to drift back for some time towards the point of departure. A slight difficulty was expected in finding a suitable spot for a descent, owing to the absence of a sufficient breeze to carry the party away from the miles of housetops over which they appeared to hover for a long time. A current of air, however, was at length found, at about four thousand feet, which took the party towards some green fields. Here, after all the available ballast was thrown overboard, a good descent was made just before dark at Lee Green, near Eltham, with the aid of a large crowd of willing helpers on the end of the guide rope. A curious feature of the trip was the number of different currents met with at different heights, the balloon having several times passed over the same ground. The party intend continuing their experiments with a stronger and more suitable wind.

THE Rev. H. N. Hutchinson, whose works on geology, prehistoric archæology, etc., are well known, is now engaged upon a popular illustrated work which Mr. George Allen will publish in twelve monthly parts, price 7d. each, beginning on October 15. It will be remembered that one of the greatest successes in the book world of last year was "The Living Races of Mankind," containing a splendid and unique collection of over 600 photographs which Mr. Hutchinson himself collected. The scheme of that book occurred to him while engaged in a work on prehistoric man, and took nearly four years of hard work to complete. Encouraged by its great success, he is now about to launch his new scheme, which will be uniform with the last. The title of the work is "The Living Rulers of Mankind." Mr. Hutchinson has already made a large and unique collection of photographs for purposes of illustration, sending a special agent abroad to collect for him. The reader will find in this book practically all the Rulers of Men—Emperors, Kings, Queens, Sultans, Amirs, Ruling Princes, Dukes, and all the Presidents of Republics. In addition to portraits of the rulers and their families, the illustrations comprise exterior and interior views of palaces, gardens, royal yachts, thrones, country houses, together with special groups and important public ceremonies. Eastern countries will be dealt with exhaustively, so as to illustrate many of the lovely and gorgeous palaces of China, India, Japan, Siam, and Annam. The photographs from China will show many lovely and picturesque buildings now, alas! destroyed. The text will give complete biographical accounts of the rulers themselves, and it will be eminently readable, with many amusing anecdotes.

Commercial & Legal Intelligence.

THE latest price list of trade photography issued by Mr. S. H. Fry of 12, South Villas, Camden-square, N.W., contains some pleasing specimens of sepia-toned bromide printing, a process of which Mr. Fry makes a speciality.

WE understand that the business of W. H. Assender and Co., Ltd., of Forest Hill, lime cylinder manufacturers, has been sold by the liquidator, and that it will in future be carried on by Messrs. A. Green and Co., Woodside, South Norwood, S.E. Mr. E. H. Fennell, the assistant manager to the late company, goes with the business.

THE first meeting of creditors under a receiving order made on the 6th ult. against George and William Hammersley, carrying on business as telescope, microscope, and mathematical instrument makers, under the style of Joseph Hammersley, at 37, 39, 41, and 43, Half Moon-crescent, Islington, N., was heard on September 26. It appeared from the statements of the debtors that the business was an old-established one, and was commenced by their father, who, some twenty-four years ago, assigned it to four of his sons, including the debtors, in consideration of an annual payment of £300 per year during the lives of himself and his wife. Two of the brothers having died the business during the past four years had been continued by the debtors. They attributed their insolvency to competition in trade and the high scale of wages. The statement of affairs disclosed liabilities £2344 15s. 5d., and assets £1054 10s. 7d., subject to preferential claims £221 17s. 2d. Mr. Leslie Antill appeared as solicitor for the debtors, and stated they were desirous of submitting to the creditors a proposal for the payment of a composition of 10s. in the pound. After some discussion the meeting was adjourned to October 10 in order that the proposal might be voted upon by the creditors.

LORD AVEBURY on Technical Education.—Speaking at Southend-on-Sea last week, Lord Avebury said he could not help feeling that among all the great discoveries of the nineteenth century the importance of education was one of the greatest. During the last 50 years they had covered the country with schools, and now happily most of their children were school children. It was a significant fact that, according to the last return of the General Prisons Board, out of 28,000 prisoners only 185 were what they could call fairly educated. Education should be moral and religious, useful and practical, interesting and inspiring. Character was more important than learning. The love of knowledge was more important than knowledge itself. A child who left school knowing little, but longing to learn, would soon distance another who had been taught a great deal, but had been bored to death. The one would teach himself more than the other ever knew. Two of the greatest mistakes about education were to suppose it could be obtained entirely from books, and that it should be confined to youth. On the contrary, if they had eyes in their head, they would learn more from looking about them than from books, and their education for good or for evil lasted through life. Every child should have a good grounding in nature knowledge, and it would make life far more interesting. The object of education was to make a boy into a man, and a workman afterwards. After a certain age—and the exact period must depend upon circumstances—specialisation should begin, so that the young man should know "something of everything and everything of something." It should not, however, begin too early, not till the foundations of a general education had been well laid. They heard a great deal about the loss of their commercial position, and especially about the great strides made by Germany. He saw no reason for discouragement; but he was profoundly convinced that they could not expect to hold their own unless their system of education was greatly modified. They had some interesting figures in the diplomatic and consular reports issued by the Foreign Office, especially those of Consul-General Oppenheimer, Consul-General Schwabach, and Dr. Rose, of Stuttgart. In the case of sugar the strontium process seemed to be against improvement, and no less than 90 per cent. of the sugar was now obtained by it. Liebig's discovery, as it might fairly be called, of superphosphate of lime had created a great industry. The artificial alizarin colour had practically replaced madder. In 1870 France produced 25,000 tons of madder, which gradually fell to a few hundred, and now even the trousers of the French troops were dyed with artificial red "made in Germany." In medicines chloral and chloroform were discovered by Liebig, antipyrine by Knort, and sulphonel by Baumann. Germany now produced 70 per cent. of the quinine of the world, and exported 65 per cent. Of smokeless powder, explosives, cartridges, cellulose, soluble glass, ultramarine, stearic acid, glycerine, oxalic acid, white lead, and matches she also exported large quantities. He would mention one other product, which was specially interesting—namely, liquefied carbonic acid. That remarkable industry only began practically in 1882, when 100 tons were produced. In 1891 it had risen to 3000; in 1897 to 11,000; and in 1898 to 16,000 tons, of which Berlin alone consumed 1800 tons. Among artificial sweetening substances he referred to saccharine. He did not include sugar, because the German beetroot sugar was an artificial industry, involving a ruinous loss to the country. Taken altogether, those chemical industries, without including sugar, reached a value of over £50,000,000, and the results of the discoveries in electricity, metallurgy, etc., would have to be added. It was evident then that the technical instruction of Germany had been a very remunerative investment; in the first instance, no doubt, a great national advantage, but a boon also to the world as a whole.

Patent News.

THE following applications for Patents were made between September 16 and September 21, 1901:—

FOCUSSING SCREENS.—No. 18,587. "Improvements in Focussing Screens for Photographic Cameras." HERBERT WELD-BLUNDELL.

SPOOLS.—No. 18,591. "Improvements in or relating to Spools for Photographic Films." (Communicated by Actien-Gesellschaft für Anilin-Fabrikation, Germany.) CHARLES DENTON ABEL.

EXPOSURE CALCULATORS.—No. 18,631. "A Calculator for ascertaining the Exposure given by a Photographic Shutter in which the Speed and Aperture are adjustable." HENRY PERCY TATTERSALL and GEORGE ARTHUR PICKARD.

FLASHLIGHT APPARATUS.—No. 18,820. "Improvements in Group-flashing Apparatus." ALAN BREBNER.

ENLARGING APPARATUS.—No. 18,880. "Improvements in or relating to Photographic Enlarging Apparatus." WILLIAM FREDERIC BUTCHER and the Firm of W. BUTCHER & SONS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
7	Camera Club	*The Uses of Photography in recording the Progress of Fires and Fire Tests.* Ellis Marsland.
7	Croydon Microscopical	University Extension Lectures: *Scenery of the British Isles.* F. W. Rudler, F.G.S.
7	South Manchester	Photographic Social Evening.
8	Leeds Photo. Society	*A few Manx Photographs.* J. W. Addyman, B.A.
8	Royal Photographic Society	President's Annual Address.
9	Croydon Camera Club	Demonstrations: *A new Reducing Formula,* and *Thomas's Colour Toning for Prints and Slides and the Twopenny Tube for Development and Toning.* Ben. E. Edwards.
9	Photographic Club	Open Night and Exhibition Matters.
10	Camera Club	Demonstration of Photo. Novelties.
10	Liverpool Amateur	Social Evening: Pianola Recital. H. N. Bushby.
10	London and Provincial	*Printing Processes, Past and Present.* T. Thorne Baker.
10	Richmond	*The Making of a Lantern Slide.* F. P Cembrano.
10	Rodley, Farsley, and District	*Bromide.* H. Crossley.
12	South London	Excursion: St. Paul's Cray. Leader, W. C. Cooper.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 26,—Mr. R. P. Drage in the chair.

Mr. S. H. Fry showed a set of three small bromide prints beautifully tinted by means of local toning with iron and copper sulphates and ferricyanide of potassium.

Mr. Bond showed some specimens of three-colour photography he had executed by the Sanger Shepherd process, one of these, a lantern slide transparency, being left unbound so that members could see the three separate primary colours of red, blue, and yellow, the blue transparency being on glass, and the yellow and red on celluloid, the three being then carefully placed in juxtaposition with an ordinary cover glass over the celluloid.

The business of the evening, a discussion on self-toning papers, was then proceeded with.

Mr. Brown passed round a print on Paget's self-toning paper, half of which he had dipped in the salt bath previous to placing in the hypo, the result showing two distinct tones, the half that had been treated with the salt bath being distinctly on the cold or purple side, the other half showing a warm brown.

Mr. Teape remarked that he had tried to vary the tone on this paper by means of differing the length of time of immersion in the salt bath, but this had made no appreciable difference in the tone.

Mr. Brown thought it a great drawback that only these two tones were obtainable.

Mr. T. E. Freshwater showed some excellent prints on Mallandain's V.B. paper. This paper is only printed out faintly, the print darkening when placed in the water; when the desired depth is reached the print is transferred to a very weak solution of hypo (quarter ounce to twenty ounces water) for only thirty seconds, the finished prints being very uniformly a nice brown. Mr. Freshwater noticed that the paper wanted very much more printing out than laid down in the instructions issued by the makers.

The Chairman remarked that this paper was very similar to one which was on the market some years ago, and known as "Aptus sepia-type paper," the manipulation being exactly the same.

Mr. Brown queried whether a paper that was fixed in such a weak solution of hypo, and for such a short time, would really be fixed, or have any chance of permanence.

Mr. Haddon pointed out that the makers did not guarantee it to remain permanent over nine months.

The Chairman said he had kept prints made on the Aptus paper for five or six years, and had noticed no deterioration whatever.

Mr. Drage also thought that this paper would require less washing than the ordinary toning papers, there being only hypo used, and that in a very weak solution.

Mr. Teape had found in his experience that to obtain anything like a nice tone on the Paget's paper by merely washing and fixing, and not using the salt bath first, a very plucky negative was needed, a negative that would almost bronze the paper in the shadows. Mr. Teape showed a print made on albumenised paper on June 11, 1888. This print had been printed extremely dark, then washed, and fixed only, and was now, after all these years, in an unaltered condition.

A print was also shown made on Solio P.O.P. This had been printed so deep as to be undiscernible. This was then put in the hypo bath for nearly three hours, the resulting tone being very pleasing.

The discussion then became general as to the question of the permanency of these self-toning papers, and the meeting ended in a general conversation on the action of various toning baths.

North Middlesex Photographic Society.—Mr. E. S. Barrelet, F.C.S., gave a lecture on "Synthol," a new developer of British origin and manufacture. It is a non-staining and energetic developer, and used simply with a solution of sodium sulphite. A solution made up as follows constitutes a normal developer:—Sodium sulphite, 300 grains; synthol, 30 grains; water, 10 ounces. Potassium bromide can be used on cases of over-exposure with marked effect, while dilution with water lessens contrasts and gives a soft result from an under-exposed negative. It can be used for bromide papers and lantern slides, and warm tones of pleasing colour can be obtained on the latter by long exposure and the use of bromide.

Liverpool Amateur Photographic Association.—This Society opened its winter session on Thursday last, at the club rooms, Eberle-street. Thirteen new members were elected, and the Chairman, having drawn attention to the prospective engagements, called upon Mr. George E. Thompson for his lecture, "Three Continents in Six Weeks." Although spending only four days in Egypt, Mr. Thompson contrived to take a large number of views, among them, those of the Pyramids, the Sphinx, and a trip up the Nile were especially interesting, while his graphic description of the scenery and incidents was spiced with a delicious touch of humour. Exquisite pictures of the Bazaar of Cairo, the mosques with their graceful minarets, and the street life of this strangely picturesque city were accompanied by shrewd observations on men and things, and were listened to with rapt attention by the audience.—At the close the President, Dr. Llewellyn Morgan, moved a vote of thanks to the lecturer, which was carried with acclamation.

FORTHCOMING EXHIBITIONS.

1901.

October 4–Nov. 2..... Photographic Salon, Dudley Gallery, Egyptian Hall, London, W. Hon. Secretary, Reginald W. Craigie, Dudley Gallery.

,, 4 ,, 2..... Royal Photographic Society, New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.

,, 29 ,, 2..... Rotherham Photographic Society. Drill Hall, Rotherham. Hon. Secretary, H. C. Hemingway, Tooker-road, Rotherham.

November 6–8 ..... Hackney Photographic Society. Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.

,, 23–30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.

Dec. 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

,, 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart, 93, Norfolk-street, Glasgow.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE BACKING OF PLATES.

To the EDITORS.

GENTLEMEN,—M. Levy is certainly wrong as to the phenomena of halation having only been noticed for the last six years. I remember being present when both the phenomenon and its cause were explained by an eminent man of science some thirty years ago. But a reference to your issue of March 30 of last year will prove to M. Levy that he is mistaken, especially if he will go further back to the correspondence alluded to in the beginning of the article on page 196 of the volume.

That there has not been much notice of the phenomenon till lately is easily explicable; lenses were not so good as now, though, personally, I doubt that being of much value as an explanation; next there has

been the constant search for softness, not by fully exposing and bringing out the multitude of detail which Nature uses to produce it, but by purposely putting the images out of focus, of which the resulting indefinition obscured the halation, while the shortness of exposure itself prevented the reflected light being present in sufficient strength to produce a marked effect; and lastly, and perhaps mostly, from the fact that halation is conspicuous only when there are strong contrasts, and the parts of a picture where these occur are not those which court examination as a rule. Of course, there are other things, too, which obscure true halation, and which have passed under the name, but they, too, are of old date.

Backing certainly does improve the image. Theoretically, of course, I have long known this, but it is somewhat troublesome to remove the backing, and I have been discouraged from trying; but recently I have done so, and though I spoilt some good plates in removing the backing, I have got over the difficulties, and can see how much gain there is, even under ordinary conditions.

The other phenomenon mentioned by M. Levy may be only an effect of contrast; a somewhat similar one was long ago noticed by astronomers, and shown to arise from this cause, but it is difficult to judge without reference to the prints and some knowledge of circumstances. These problems somewhat resemble crime detection.—I am, yours, &c., J. F. T.

To the EDITORS.

GENTLEMEN,—I received as usual THE BRITISH JOURNAL OF PHOTOGRAPHY, and find in it an answer to my letter from Mr. A. Lockett, and I can only be sorry, even very sorry, that he has not completed his answer by stating (if not a trade secret) how he can produce the peculiar halo, and, above all, how he is capable of avoiding it? It would take too much of your valuable space if I were to answer fully his letter as regards my own experience, which extends now about thirty years, and I have negatives as far back, and have not seen this defect before the time mentioned. However, I have always looked carefully at all my negatives before and since this controversy. Now, I would respectfully ask Mr. A. Lockett the following question:—"If I so see on the focussing screen this peculiar halo how can I avoid it on the plate?" I would also mention here that I have no studio, but do all my work outside, and all in the architectural line, therefore cannot easily move my subject around, nor have I screens nor reflectors about. I send you to-day by mail two views to illustrate the trouble. One is a blue print, an enlargement from a negative 5×4, and the black print enlarged from a figure about 1½ in. original. You will, on the blue print, see around the figures and windows in the shade a whitish halo, and nothing on the black parts; while on the black print you can see a dark object with a whitish halo around it, while the dark object itself has a halo of darker shade inside its outline. Look at the left and right arm of the man, and, in fact, all around the different subjects of the picture. The blue print was taken in full sun, as you can see, but the black print was taken in front of a dolmen of dark grey stone on a cloudy summer day. Both subjects could be hardly moved. An answer as to how to avoid this halo would greatly oblige. I may also add that the one view was taken on a backed plate; the other was not backed.—I am, yours, &c., A. LEVY.

P.S.—Mr. A. Lockett asks me to try on an object where I would expect such a halo. Unfortunately I do not expect it anywhere, but find it always very unexpectedly.

TINTERN ABBEY.

To the EDITORS.

GENTLEMEN,—I am pleased to be able to inform you, upon the authority of Mr. E. Stafford Howard, C.B., Chairman of H.M. Woods and Forests, that the paragraph which appeared in several papers to the effect "that permission to photograph in Tintern Abbey is withdrawn" is incorrect.—I am, yours, &c.,

RICHARD W. DUGDALE.

Harold Villa, Kingsholm, Gloucester, Sept. 24, 1901.

CARBONA PAPER.

To the EDITORS.

GENTLEMEN,—To those who use carbona perhaps this simplification of a formula may be useful, but my object in writing is to call attention to an unintentional improvement on the original which, as applied to P.O.P., so far as I know, is novel.

Having a rooted objection to weighing out chemicals in making up formulæ, and also to getting my solutions ready made in any form, I had to set about putting my formula for carbona gold toning into convenient shape. In this case the usual 10 per cent. solution is out of the question, so far as borax is concerned, because borax is not soluble to that extent in water; neither is it soluble to quite five per cent. without the assistance of glycerine, and that is just the point that led me to a happy result.

Having prepared a 10 per cent. solution of acetate of soda, and having my gold chloride at 15 grains in 15 drs. fl. of water, the best manner of solving the borax difficulty had to be considered. To make a 10 per cent. solution, a very large percentage of glycerine is necessary, but to make one of five per cent. only a very small amount is required. I find about two drs. fl. of glycerine will answer to convert one ounce avoirdupois of borax into a five per cent. solution.

The maker's formula works out very nicely with these solutions thus:—

Stock Solutions.

I.

Acetate of soda ..... 1 oz. av.
Distilled water, up to .....9 oz. fl. 55 min.

II.

Borax .....1 oz. av.
Glycerine .....2 drs. fl.
Distilled water, up to .....9 oz. fl. 55 min.

III.

Gold chloride .....15 grs. (one tube).
Distilled water .....15 drs.

For Use.

I.

(1) Acetate solution .....1 oz. fl.
(2) Borax solution .....1 oz. fl.
Water up to .....6 oz. fl.

II.

(3) Gold chloride solution .....1 dr. fl.
Water up to .....6 oz. fl.

To compound the maker's formula quite accurately, the amounts of I. and II. used should read 1 oz. fl. 20 min., but for all practical purposes I find 1 oz. quite near enough. The glycerine has no apparent effect on the toning, but when it comes to drying it makes itself felt very decidedly. The prints being blotted off, and hung up to dry by one corner in wooden clips, dry quite flat.

If any curling whatever is noticeable, it is a very slight tendency to curve backwards. They can consequently be mounted dry with the greatest ease. Of course, this use of glycerine is old as applied to films, but I have never seen it recommended for prints, and it seems to me that it might be utilised in the toning bath with great advantage, especially with papers much given to curling up tight in drying, and with those that are thick, such as matte solio it would make it much easier to put them as soon as dry into slip-in mounts or albums, for which such varieties are specially suitable.—I am, yours, &c., P.O.P.

ANOTHER PHASE OF COUPON TRADING.

To the EDITORS.

GENTLEMEN,—The "Ogden-Lever" scheme appears to have died a natural death, but it has left its imitators. The latest, I believe, is the usual thing, run by the firm of Salmon and Gluckstein, viz., a certain number of coupons, plus 2s. 9d., for which they supply a 12×10 bromide, on a plate-sunk mount. Now, though I do not approve of the manner of trading, I must say the firm is honest enough not to imply that they are offering an article usually sold for a guinea at the small figure mentioned. Yet this parasite keeps annoying most of us, not because it touches our pockets, but because the tendency undoubtedly is a lowering one to our profession; and for that reason alone we ought to do our best to find the firm or firms who supply this article, and see that we do our level best to keep any of our orders getting into their hands. If this is done by every individual in the profession it is bound to have a moral, if not a material, effect.—I am, yours, &c., H. EDMONDS HULL.

136, Holland Park-avenue, W., September 24, 1901.

THE "JOURNAL" ABROAD.

To the EDITORS.

GENTLEMEN,—I have much pleasure in sending you something for the forthcoming ALMANAC, and hope it will be suitable. You may feel interested in hearing of the remotenesses to which THE BRITISH JOURNAL OF PHOTOGRAPHY finds its way. Some months ago I had a letter forwarded to me by a London photographic firm. It was from one of the Sandwich Islands, and the writer stated that a copy of the JOURNAL containing an article on intensification by myself had accidentally come into his hands, which proved of great help to him in his work. He wrote to thank me, and trusted to the firm in London finding my location. It is gratifying to find both that the JOURNAL is so omnipresent, and that one's efforts to convey information meet with success in the most desirable way.—I am, yours, &c.,

G. T. HARRIS

Tan-y-bryn, Menai Bridge, North Wales, September 30, 1901.

THE KODAK COMPETITIONS.

To the EDITORS.

GENTLEMEN,—As we have received several inquiries as to the class of our £300 Kodak Competition in which No. 1 Panoram Kodak prints are admissible, would you kindly allow us to state that No. 1 Panoram photographs should be entered under Class B, which refers to pictures larger than $3\frac{1}{2} \times 3\frac{1}{2}$ inches.—We are, yours, &c.,

KODAK, LIMITED.

43, Clerkenwell-road, London, E.C., September 28, 1901.

PROFESSIONAL PHOTOGRAPHERS AND THE PLATE-MAKERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—In reference to the "letter from a well-known manufacturer," quoted by you, his arguments and deduction seem very clever, looked at from his standpoint, but may I give my standpoint, which throws a different light on the matter of discounts? I send a letter to my dealer, who sends a letter to the makers to forward me a certain quantity of plates. This dealer does not keep any stock of plates, so takes no risk in keeping a perishable stock. He simply gets a percentage because he acts as middleman. Is this fair and just? This is a case in which the dealer pockets his percentage for writing a letter, or in most cases a halfpenny post-card. A professional prefers to buy direct, for the simple reason he insures his plates being fresh. Why should not the professional who buys £20 worth of plates direct from the maker get the same discount as the middleman who writes his halfpenny post-card?—I am, yours, &c., FETTERED LANCE.

September 27, 1901.

To the EDITORS.

GENTLEMEN,—Referring to the letter you quote from "a well-known manufacturer," in your issue of the September 27, I should like to say either he is not cognisant of what goes on at the Platemakers' Association meetings, or he is wilfully trying to deceive yourself and readers, as you will observe from the following facts.

At the end of May this year I wrote to the Platemakers' Association asking to be placed on the dealers' list as I wished to supply amateurs—I enclosed invoices from manufacturer, and order from customer asking for more goods "to prove my *bona-fide* intention," but in spite of this the Association refused to grant my request, presumably because I was a professional.

I do not know what the writer of the above-mentioned letter considers a *fair* profit to get, but the manufacturer allowed me ten per cent. off spools and dry plates, and *nothing* off paper, and I had to give nearly three months' credit.

If this "well-known manufacturer," thinks this is "fair" to us as a body, all I can say is that he knows little and cares less about the professional photographer.—I am, yours, &c., MIDLANDER.

October 1, 1901.

OZOTYPE AT THE EXHIBITIONS.

To the EDITORS.

GENTLEMEN,—There are eleven Ozotype pictures on view at the Photographic Salon, and eight at the New Gallery. This information may be useful to you.—We are, yours, &c., THE OZOTYPE COMPANY.

1, Weedington-road, London, N.W., October 1, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. Werner, 38, Grafton-street, Dublin. *Photograph of the late Mr. Justice Murphy.*

J. E. Stevens, 39, West-street, West Bank, Widnes, Lancs. *Photograph of St. Mary's Parish Church, Widnes.*

ADDRESS WANTED.—F. H. T. writes: "I should feel obliged if you can give me address of printers of the usual 1s. books of local views, from prints or negatives supplied; also printers of pictorial post-cards. Firms about the West are far too high in price."—In reply: Most collotype printers will supply the picture books if the negatives are supplied to them, the Autotype Company, for example. They and similar firms will also print the post-cards.

OPAQUE LANTERN.—"EXPERIMENT" writes: "Can you give me the address of a firm who make lanterns for opaque slides?"—In reply: Messrs. Newton and Co., Fleet-street, E.C., make a speciality of lanterns for the purpose.

ADDRESS WANTED.—"PHŒNIX" writes: "A short time ago you mentioned a new system of artificial light portraiture, I believe, under the name of 'Atmospheric Gas.' Can you tell me where I can get full particulars?"—In reply: Of the Atmospheric Gas Company, Leeds.

ADDRESS WANTED, &C.—L. MELDON writes: "Perhaps you would kindly give me the address of Messrs. Underwood and Underwood, of London? Also could you tell me of any expert who would remove a film as described by you on page 580? The negative is too valuable for me to try it."—In reply: The address of Messrs. Underwood is Red Lion-square, London, W.C. The Autotype Company will no doubt transfer the film for you.

SITUATION IN SOUTH AFRICA.—C. H. writes: "I should deem it a favour if you would advise me as to whether I should have much difficulty in obtaining a situation as photographic assistant in South Africa, say, for instance, Cape Town or Port Elizabeth, as I am thinking of trying my luck in a foreign part? I am experienced in all branches of the trade, and young (22)."—In reply: We should not recommend you to go to South Africa at present. You should wait till things get more settled there before starting. We believe there are plenty of photographers there for present requirements.

ARTIFICIAL LIGHT PORTRAITURE.—R. F. writes: "I have just fitted an arc lamp (1000 c.p.), and in addition to that I have a series of incandescent, and I find I get some nasty shadows, as per specimen enclosed. Could you tell me the best method of diffusing the light so as to get as much light as possible? You will see a shadow just below the nose."—In reply: The way to soften the shadows is to place the light a little more in front of the sitter, and then place a reflector at the shadow side, so as to reflect some of the light back on the figure. In this way the heavy shadows will be overcome.

COPYRIGHT.—"YORKS" says: "About a month ago I took some photographs of a fête here. I did the work all myself, and not on any commission, but as a speculation. Before I sold any copies I had the pictures copyrighted, and now I find one of the illustrateds —the ———— —has reproduced two of them. Can I come down upon them for damages?"—In reply: Certainly you can, and will recover them. As the journal has a very large circulation, you may possibly recover the larger sum by suing for penalties. Better put the matter, without delay, in the hands of a solicitor well versed in copyright matters.

MOUNTING PRINTS.—A. J. P. writes: "In mounting glazed P.O.P. prints (backed) I used the mountant round the edges only. I should be very glad to know if there is any way of mounting them so that the mark of the mountant does not show? I have seen some prints where very thick backing (like card) was used. These, of course, showed no mark. I should like to know something about this also, as it seems as though there would be a difficulty in squeegeeing."—In reply: The backing paper is supplied by all the large dealers. This is applied to the prints and then they can be moistened in the ordinary way without loss of the gloss.

VARIOUS QUERIES.—"REX" writes: "Will you kindly say—(1) whether papier-maché dishes can be re-enamelled, and if it would pay me to do so? I use one for developing, and after a certain amount of using the surface peels off. (2) I see in the JOURNAL of Sept. 20 potassium metabisulphite is added to hypo. What is the advantage? (3) Is there any book published on background painting? (4) Is the blue-print process an expensive one?"—In reply: (1) They might be, possibly, but the expense would be no doubt greater than the first cost. (2) It is merely a simple way of making an acid fixing bath. (3) Not that we are aware of. (4) No, just the reverse; it is an inexpensive process.

TONING BROMIDES.—"TONING BROMIDES" writes: "I shall feel very much obliged if you can give me a formula or explanation how to do toned bromides; also can you inform me if any bromide can be toned, even if it has been done some little while?"—In reply: There are different methods of toning bromide prints. There is Mr. Ferguson's method, with copper, which is given on page 876 of the ALMANAC for this year. Then there are the uranium and the hot alum methods which are described on pages 717-719 of the ALMANAC for last year. The space in this column is too limited to repeat the details again, so we are compelled to refer you to the ALMANACS. The prints may be toned at any time.

PHOTO-MICROGRAPHY.—W. V. writes: "Many thanks for your reply, which, I presume, should be termed photo-microscopy to be more correct. I regret I did not clearly explain my meaning. Thanks also for naming the best book on the subject. Of course I did not mean those minute photos which you require a microscope to see, or I should not have named the enlarging to lantern or cabinet size. My query stands thus: 'Do you know of any market where enlarged microscopic slides (say, cabinet size) would find a ready sale?' Your reply does not answer my question."—In reply: We do not think there would be much demand for the pictures as other than lantern slides. Messrs. Newton and Co., Fleet-street, make a speciality of slides of this class. Better write them, and send sample.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Death from Cyanide of Potassium.

It is seldom nowadays that one reads of a case of poisoning by cyanide of potassium in connection with photography. It was very different in the days of collodion, when the salt was the most general fixing agent for negatives as well as for glass positives. Then deaths from it, either suicide or misadventure, were by no means uncommon. One day last week, however, an inquest was held at Monkstown, co. Dublin, on the body of a doctor who died of poisoning by cyanide. The sister of the deceased said at the inquest that she had seen him drink cyanide of potassium out of a tumbler. On a card found on a table beside the body was the following extraordinary statement, written in pencil: "Notice. Don't bury me. I am not dead. Don't mind the doctors, unless they put a knife through my heart. You will never forgive yourselves. To any divisional Court that I may be thought dead—No mortal can tell if a man is dead until he begins to rot, or there is a good hole through his heart or head." At the inquest it was stated "that the

doctor was in the habit of using cyanide for the purpose of developing photographs," and, in the end, the jury returned a verdict of death by misadventure. It would be interesting to learn what process the doctor worked in which cyanide of potassium was the developing agent. Perhaps, however, with the reporter of the inquest, developing and fixing are synonymous terms—they often are with the lay press. As we have just said, cyanide of potassium is now comparatively but little used by modern photographers, but still it is occasionally as in intensifying negatives by the cyanide of silver method, also in the ferrotype process, and accidents are always liable to happen. Unfortunately there is no recognised antidote for the cyanide as there is with some other poisons used in photography—bichloride of mercury and oxalic acid, for example. If after the bichloride is swallowed the whites of two or three eggs be quickly administered, little harm will result. Such would also be the case with the oxalic acid if some chalk, or common whiting, in water, were taken; then an insoluble oxalate of lime, such as is often noticed on negatives and lantern slides that have been developed with the ferrous oxalate, forms if the water contains lime. These are simple antidotes which are usually always ready to hand in every house. Only a few days ago we read of a death from taking oxalic acid in mistake for Epsom salts—a not unusual mistake, as the crystals are so much alike—and there is little doubt that had some whiting been mixed with water, and swallowed directly, the life would have been saved. Cyanide of potassium, however, like prussic acid, is more rapid in its action, particularly if the stomach is empty, and death sometimes results in a few minutes, and often before medical aid can be obtained. As we have just said, there is no reliable antidote for this poison. We remember, on one occasion, a medical man, at an inquest, saying that he should have administered a solution of nitrate of silver had he been in time, so that an insoluble cyanide of silver would be formed in the stomach. But, to us, this seems a doubtful matter, as the remedy might prove "as bad as the disease." What is more generally suggested is a solution of sulphate of iron—which is generally to be found in the dark room—in which case an insoluble prussiate of iron—prussian blue—would be formed, and any excess of the sulphate of iron, not combined with the cyanide, could be afterwards dealt with by a doctor. But it should be kept in mind that in all cases of poisoning the antidote must be administered at once, and before the poison is absorbed in the system, for it to be really efficacious.

* * *

Fraudulent Photographs. In a recent issue Mr. C. Brangwin Barnes —see page 606 ante—calls attention to a fraud that is being perpetrated on the public by not a few photographers at the present time, and we are sorry to find that the fraud is on the increase. It is that of supplying contact bromide prints for platinotypes, and charging a higher price for them than would be charged if silver prints were ordered. Of course, any one doing this is liable to prosecution under the Merchandise Marks Act, and he can be mulcted in heavy penalties, though all may not be aware of the fact. What is more, any one may institute proceedings, though, so far as we know, no prosecution has, as yet, been instituted for the fraud. At present there is no association, as there is in many other businesses, that would take the matter up. Some time ago the British Bacon Curers' Association (we think we are right in the title) prosecuted a number of cheesemongers for selling American and Canadian hams as York or Irish ones, and the vendors were in all cases mulcted in heavy penalties and costs, and thus, to a great extent, an end was put to the fraud. Only a short time ago, as Mr. Barnes mentions, a firm of wholesale tobacconists were prosecuted for selling as "hand cut" tobacco that which was cut by machinery. Mr. Barnes, in his letter, says, that he thinks that the new Association would be the proper body to take the matter of supplying bromides as platinotypes in hand. It will be remembered that the President of the Association, at the time it was formed, referred to the subject as being one desirable for consideration. We have more than once heard surprise expressed that the Platinotype Company, whose interests are directly affected, do not prosecute some of those who commit the fraud. There is no question that if silver prints are passed off as platinotypes, and they fade, it will do a deal of injury to the process, and the honest workers of it, by bringing it into disrepute. Good bromide prints are hardly distinguishable, by their appearance, from genuine platinotypes; but a drop of a solution of bichloride of mercury at once reveals the imposition—the silver image disappears, while a platinotype one remains intact.

* * *

The Past Summer. Outdoor photographers are to be congratulated on the weather they have had during the past summer, at least in Southern and Midland districts. We say outdoor photographers because the weather, during the summer months, with gelatine plates, is of very little moment to portrait photographers; the light is always good enough in these circumstances. The weather report for the last six months shows that, at Greenwich, the rainfall has been no less than 2.6 in. less than the average for the last fifty-five years. One marked feature of last summer, as most affecting the outdoor photographer, was the excess of bright sunshine. The reporting station of the Meteorological Office, at Westminster, shows an excess of 260 hours for the summer six months, April to September. The sunniest month proved to be May, with a total of 237 hours, an excess, on the average, of 72 hours, whilst September was the least sunny month, and then there was a deficiency. In that month there were only 98 hours of sunshine, which is 18 below the average. The above report shows that snapshotters have been well favoured this year for taking London street scenes, and they have freely availed themselves of the opportunity, if one may judge by the number of hand cameras that have been in evidence in the streets during the past summer. It may fairly be assumed that London has been more photographed this year than it has ever been before, and the plate and film makers must have reaped a good harvest, and we congratulate them on the occasion.

* * *

The Possible Platinum Famine. On the 20th September we drew attention, under the items of Commercial and Legal Intelligence, to an article in "Feilden's Magazine" concerning the scarcity of platinum. A Bill has been debated in the German Reichstag for the prohibi-

tion of the use of the metal for purposes where it may be dispensed with, as in photography. Our German contemporary, the "Photographisches Wochenblatt," also refers to the question, but under a different aspect. An English company is said to have obtained the monopoly of platinum, and maintains it by buying up every fresh source of supply as soon as discovered. The company regulates the price according to the demand, and fixes it as high as possible. The Editor of the "Wochenblatt" recognises the futility of Government intervention in such matters in the past, and thinks the best way of combating monopolies of the kind is the formation of a Council of Commerce, whose decisions should command such respect that merchants and others should be compelled, through public opinion, to conform to them. We fear that such means are only practicable where small areas are concerned. The international difficulty arises here, as well as in the case of legislation by any single Government. It might also be objected that a small industry, however scarce the article might be in which it dealt, would have little chance of defending itself, if a large number of consumers combined and dictated the price. But after all, what is the best safeguard against waste, and what better means can we devise to insure an article being reserved for those to whom it is most valuable, than by letting the market solve the equation of demand and supply? It is true that speculation sometimes produces hardships we should all wish to obviate; but have we any assurance that a Council of Commerce would be the incarnation of justice? Probably photography would be one of the first industries to suffer, if outside interference with the market were permitted; yet, a platinum print stands unrivalled as a permanent record, and, as such, could ill be spared. We fear the bias of Anglophobia has slightly warped the usually calm judgment of our friend in Berlin.

* * *

Can a Film be Developed through to the Back of the Plate?

A very interesting question was recently discussed at the London and Provincial Photographic Association, and it is likely to receive more attention from those who took part in the debate. Can the whole of the silver salt on a dry plate be reduced by development to the metallic state? One veteran photographer, Mr. A. L. Henderson, contends that it can be, and, on the other hand, some doubt if it is possible. There are a few points well worth attention in connection with this question. Commercial dry plates are not, all of them, similar in character, and the silver salt is not the same throughout. Moreover, is the whole of the salt uniform in sensitiveness, and may not some of it be quite insensitive to light? The developer is also a factor, and probably the results will vary, not only according to the exposure, but according to the developer used. Mr. Henderson appears to have accepted a challenge to demonstrate his contention, and it is possible, therefore, that the next meetings of the L. and P. may take a lively turn.

* * *

Beware of French Submarine Boats!

We understand that two amateur photographers have had the audacity to photograph the submarine boat, the "Sirene," at Brest. They were detected, and the Prefect of the port has issued a decree forbidding the photographing of any warship of this description, under pain of arrest and forfeiture of apparatus. The guardships have also been ordered to keep a sharp look-out, and to enforce the decree. Any person photographing the exterior or interior of a submarine boat will be treated as a spy, and brought before the Commissioner of Police. The matter will also be reported to the Director of Coast Defences, the Prefects of the ports, and the commanders of submarine vessels. The plates and photographs are to be sealed up, and only shown to the judges and the defendants' legal representatives, with strictest precautions. The spy mania seems to be as rampant as ever on the other side of the Channel, and English amateur photographers would do well to avoid giving offence to our impressionable neighbours.

PRACTICAL INSTRUCTIONS IN PYROXYLINE MAKING.

We may now, in continuation of our remarks upon recent pronouncements upon the nitration of cellulose, give an epitome of Hardwich's instructions, as published by him just forty years ago. The chemicals required are sulphuric and nitric acids. He gave special instructions for preparing the cotton wool by boiling in weak solution of caustic soda. They are not needed now if care be taken to purchase what is termed "absorbent cotton wool," which soaks up liquids like a wet sponge. Let us, however, say about it that all cotton wool is hygrometric, and therefore, immediately before use, that portion required for conversion should be desiccated by a strong heat. We have kept cotton wool on a top shelf in a very warm room, yet, when desiccated, it lost from one to one and a quarter per cent. in weight. This is most important, as the mechanical qualities of the collodion are largely influenced by the amount of water present, and water in the cotton is equivalent to a much larger proportion in the mixed acids. We recommend nitric acid of 1.42 specific gravity as being commercially obtainable so easily that any chemist would supply it. Hardwich recommended a much stronger acid; but it does not keep so well, and is difficult to procure. Ordinary commercial sulphuric acid answers all requirements: it should be bought in quantity to ensure regular conditions of working.

The formula, then, for half an ounce of cotton wool, runs thus:—

Sulphuric acid	33 oz.
Nitric acid	7 oz.
Water	4¼ oz.

All by weight. Hardwich gives fluid measures, but weighing is easier, and much more accurate than when ordinary glass measures are used.

The acids are to be mixed, if possible, in a porcelain jar, and the water added. The temperature quickly rises to about 160° or 170°F. It should be stirred with a glass or porcelain spatula, and allowed to cool down to 150°, some expedient, as a sand or water bath, being used, to keep the mixture at that temperature. When the mixture (which gives off powerful and corrosive acid fumes) is exactly 150° the wool should be put in, in pieces of about twenty or thirty grains each (the half-ounce may be separated into, say, ten little heaps). Between each introduction the liquid should be well stirred. After exactly ten minutes the cotton

should be squeezed into a lump at the side of the jar, taken out and dropped into a large vessel of water, and violently stirred about, so as to thoroughly and quickly dilute the acid. It should then be thoroughly well washed in frequent changes of water, and when neutral to test paper spread out to dry, away from any fire.

A little experience will enable the worker to tell at once whether the result is satisfactory or not. If the pyroxyline is right the fibres will be rather short, but the whole mass not disintegrated, and feeling soft to the touch in the water. It may be wrong from three causes, as follows:—Too great heat, or too much water in the mixed acids, will alike cause the cotton to be short and broken. The greater the extent of these causes the more thoroughly will it be disintegrated, to the extent, it may be, of becoming almost a powder.

Too small a quantity of water will have an opposite effect. The cotton will be hard and harsh to the touch, while squeezing it out in the water, and the fibres will be strong, tough, and unaltered in appearance. Collodion made from the former kind (with excess of water or heat) will be very limpid, and flow beautifully; but when it is dry it will be opaque and papery looking. When belonging to the last-named class it will dissolve readily (unless the defect of water is very great, in which case it is merely explosive cotton, and will not dissolve at all); but a very few grains to the ounce will give a very thick liquid, which will dry perfectly clear and transparent, but it will be impossible to prevent it setting in ridges and streaks.

When, however, all proportions are correct, the heat right, and the result the kind aimed at, a bright clear collodion will be made, which will pour well, dry even, and without ridges, and be a thoroughly workmanlike product.

Until experience is gained there is, however, another and accurate criterion of quality. Adhering exactly to the proportions, quantities, and time of action of acids, the quality of the resulting pyroxyline may be completely gauged. The product should be increased in weight by not less than twenty, nor more than thirty, per cent. If the minimum be not arrived at the collodion will be difficult to use, as the negatives will be so liable to spots. If the maximum be exceeded the collodion will be thick and ropy, and will, when spread, lie in ridges. We can, from our own experience, state that these data are absolutely reliable and exact.

It will be found that extremely minute variations in the amount of water used will cause very great differences in the type of pyroxyline produced. Indeed, until we began to weigh instead of measure the liquids, we found it next to impossible to obtain a number of successive batches at all uniform in quality.

We may say we tried flax and also paper—white Swedish filtering paper—but there was no perceptible gain, and the expense was greater.

Finally, let us give a special caution. The acid fumes are very injurious if inhaled, consequently the cotton in the mixed acids should only be manipulated in a place where there is a strong draught—into a chimney, for example. Further, in pouring away the used acids, they should, before being thrown down the sink, be well diluted, or they will quickly corrode the lead work.

We may say that when once these experiments are embarked upon, the making of pyroxyline will be found an interesting, almost a fascinating process of manufacture.

PHOTOGRAPHY IN COLOURS.

MM. A. AND L. LUMIERE in continuation of their memoir upon their process of photography in colours, an abstract of which we gave in our issue for July 26, p. 472, presented a paper to the Société Française last month which practically concludes the subject, and which describes the preparation of the printing and superposition of the monochrome images.

They first prepare a bichromated tissue which is exposed and developed, and then stained and superimposed.

In preparing the tissue they point out the importance of uniformity of thickness, of the non-expansion of the paper, and the perfect regularity of the drying, and the following is their precise method of working:

Plate glass is lightly dusted over with talc and then polished with a pad of absorbent wool, till no particles are visible on the surface. The margins of the glass are edged to the width of some millimetres with the following solution:

Benzole	1000 parts.
Masticated rubber	15 „

When the edging is dry, the plate is coated with the following collodion:—

Alcohol	500 parts.
Ether	625 „
Pyroxyline	12·5 „
Castor oil	3 „

When the collodion is dry, a sheet of baryta paper cut to the exact size is squeegeed down to it, baryta side to the collodion, both glass and paper being immersed in a seven per cent. solution of gelatine at 50° C.

When dry, the paper is coated with a varnish composed of—

Alcohol	50 parts.
White varnish A (Soehnée)	50 „

After being allowed to dry for twelve hours at an ordinary temperature, it is coated with the following sensitive mixture:—

Water	1000 parts.
Emulsion gelatine	120 „
Hard glue (Coignet)	120 „
Ammonium bichromate	60 „
Solution potassium citrate (25 per cent.)	40 „
Cochineal red	1 „
Alcohol	200 „

The gelatine and glue are soaked in the water for twelve hours, then melted in a water bath at 50° or 60° C., and allowed to cool to 35° C., and then the bichromate, the citrate, and cochineal red are added in turn, and then the alcohol in small quantities at a time with constant stirring.

The plates thus coated are placed on a levelling slab, and cooled with ice till set, and then dried at a temperature not exceeding 20° C., and the drying should not take longer than twelve hours.

All the precautions taken in drying carbon tissue are applicable here and should be more vigorously adhered to. When dry, the paper is stripped from the glass.

Printing is effected in the usual way, and, the image not being visible, an actinometer should be used.

For development some sheets of glass should be talced and collodionised as described above and then coated with a thin solution 7·5 : 1000 of indiarubber in benzole. When this film is dry, the glass should be immersed with one of the prints in iced water for fifteen to twenty seconds, and then the two brought into contact and well squeegeed as in the carbon process.

Before development the glass and proof should be pressed under two glasses for five minutes and then plunged into cold water for two hours, to allow the gelatine to swell uniformly. To develop, the proof should be immersed in water at 38° C. for about half an hour, when the paper support will readily leave the print, and the film will be completely decolourised and development be complete in

about a quarter of an hour. When all the soluble gelatine has dissolved by the warm water, nothing will be left but a thin colourless film presenting a slight relief.

It should then be washed in cold water, immersed in alcohol for about five minutes and then allowed to dry.

The images in relief thus obtained are immersed in the dye solutions, red, yellow, and blue. Care should be taken not to confound the three positives, that from the negative obtained with the green screen is stained in the red bath, that from the negative obtained through the orange screen is stained blue, and that through the violet screen is stained yellow.

The following is the composition of the dye baths:—

Red Bath.

Water	1000 parts.
Solution of erythrosine J (3 p.c.)	25 „

Blue Bath.

Water	1000 parts.
Solution of pure diamine blue F (3 p.c.)	50 „
Solution of hard glue (15 p.c.)	70 „

Yellow Bath.

Water	1000 parts.
Chrysophenine G	4 „

Dissolve at 70° C. and add

Alcohol	200 parts.

The following are the chemical names and formula of the above dyes:—

Erythrosine J: $C_{20}H_6I_4O_5Na_2$. Tetraiodofluorescine. Badische Anilin und Soda Fabrik. No. 398 of the "Table des matières colorantes du Traité de Seyewetz et Sisley."

Pure diamine blue FF: $C_{34}H_{24}(NH_3)_6S_4O_{16}Na_4$. Dimethoxydiphenylbis-azoamidonaphtholtetrasulphonate of sodium amidonaphthol. No. 192 "Table de Seyewetz et Sisley," Casella.

Chrysophenine G: $C_{30}H_{26}(NH_3)_4S_3O_8Na_2$. Stilbene disulphonate of sodium diazodiphenetol. Leonhardt & Co., No. 207 "Table de Seyewetz et Sisley."

The colouration of the images is finished at ordinary temperatures after about twelve hours' immersion. After staining, the plates should be rapidly rinsed in cold water, to remove the excess of dye. The yellow image is put on one side to dry, but the red and the blue should be immersed in a 5 per cent. solution of sulphate of copper, and then rinsed and dried.

It is advisable to temporarily superimpose the images, and for this purpose two blocks of wood should be placed above a sheet of white paper, and the yellow image placed on them, then the blue should be gently placed on the top, and the outline made to coincide, and then the red image should be placed on top in the same way, and then the whole examined from above.

Notwithstanding all precautions, it is rarely that the representation of the colours is perfect, and it is easy to reinforce one or other as required by again immersing in the dye bath. For instance, if the result is too green, the red image should be intensified. The intensity of the red and yellow images can be easily reduced by merely soaking in water. As regards the blue, it resists hot and cold water acids and organic solvents; but a ready solvent of the colour is a 1 or 0·5 per cent. solution of gelatine or hard glue.

It is easy also to locally reduce the colours by the aid of a brush dipped in water. For the red pure water may be used if only a weak reduction is required, but for extreme cases a 5 per cent. solution of ammonia may be used. The yellow can be easily reduced with pure water; but it is not easy to intensify it with a brush, because of the difficulty with which the saturated solution of chrysophenine is taken up by the gelatine. From the resistance of the blue to ordinary solvents it is not easy to locally retouch with the aid of a brush.

When the preliminary superposition has proved the complete concordance of the monochromes, the three surfaces should be covered with a 1·5 per cent. solution of indiarubber in benzole, then, when this is dry, with a 1 per cent. collodion.

To fix the films to one another a temporary support of paper prepared as described above is used. This paper is applied to the yellow image and glued with the following solution:—

Water	1000 parts.
Hard glue	150 „

When completely dry, the paper is lifted and it brings with it the yellow film, then the blue image is applied, by the aid of the following solution:—

Water	1000 parts.
Hard gelatine	120 „
Glycerine	50 „

This solution, warmed, is poured into a dish, in which is immersed the glass bearing the blue image, then the paper bearing the yellow image; the two are then brought into contact and shifted till the images exactly coincide, and the excess of solution removed with a squeegee.

When the paper is quite dry, it is stripped from the glass, and the red is applied in precisely the same way. Finally the paper bearing the complete image is stripped from the glass, and the paper is easily stripped from the image by the aid of warm water.

In conclusion, the authors say that, taking all the prescribed precautions, the coloured proofs, whilst not possessing absolute permanency, may be exposed for some years to diffused light without showing any appreciable alteration.

MAKING ENLARGED NEGATIVES IN TWO STAGES.

With the increase of small cameras, enlarging is an operation more resorted to than ever, nor is the practice likely to decrease. The method by which it is accomplished varies according to the extent of enlargement required, the number of copies wanted, and the taste of the operator or of his customer. The presence or absence of grain in the resulting picture is a matter of some moment. In large work of the portrait class a certain amount of grain is desired and obtained by various means; but it will, I think, be admitted that in most cases a sharp negative is wanted to begin with, and from that as sharp an enlargement as the original will allow. In scientific work, of course, there is no room for debate—in all cases the sharpest thing attainable is desired; and where a very small picture is desired to be brought out with very considerable magnification, pictorial work also demands that the result should not show much fuzziness or even grain. Many of the subjects produced by instruments of the moving-picture type will become of historical value, not merely as moving pictures, but for details of historical interest; out of the many hundreds of minute pictures depicting a ceremony, there may be one or more amongst the large choice of them which it may be desired to have reproduced on a large scale. In such a case the avoidance of grain in the final result may be a desideratum. Where the enlargement is made direct from the small negative, the grain in the original may be made most painfully apparent. To lessen this, the enlargement may be carried from step to step; but this again, if the steps are many, may bring deterioration in its train. For scientific work and for enlarging to many diameters it will not, I think, be disputed that the most satisfactory method is to make an enlarged positive, and from that an enlarged negative, the positive being the exact medium in size between the original negative and the enlarged negative from which prints to any number are to be obtained.

Further—if the positives are made in the enlarging camera of the exact proportionally intermediate size, the adjustments of the distances of picture, lens and ground glass are made once and for all. Thus, if a series of negatives are to be enlarged four diameters, the first stage will be to get enlarged positives of two diameters, and the second stage will be to put these in place of the original negative, and without making any alterations in the camera to proceed with the preparation of the enlarged negatives. The instance here given, that of four diameters, is a simple one. An equally simple instance, would be that of nine diameters, for in this case the enlarging would be three times at each stage. The next simple instance would be sixteen diameters or four times four. The next would be twenty-five,

or five times five; the next, if it were desirable to enlarge so much, would be six times six, and so on. Such work, however, would seldom be confined to these very simple instances. Forgive me if I am wrong in saying that the average operator would be at a loss to proceed if the work was required to be done with exactitude; certainly the slide-rule is not an accessory of the ordinary studio, and even the scientific operator might prefer the handy compass and set-square, giving as it does, in a simple way, a practical scale readily obtained when once the principle is grasped. And here I may tell my superior critic, who may say that I am only peddling Euclid, I., 47, that as he can take care of himself, it is not for him that I am writing.

To obtain a negative twice the diameter of the original in two stages is very simple. For all practical purposes, of course, enlargements of a few diameters only are as good when made from a contact transparency, but the obtaining of negatives of two or three diameters is the foundation of a whole series. Take two points on the original negative, and draw on a sheet of paper a square with this distance as side; the diagonal of the square will give the distance apart the two points should appear on the ground glass for the transparency; when the enlarged transparency is put in place of the original negative, the resulting enlarged negative should be exactly twice the diameter of the original, no re-focussing or re-measuring being required. Here, at each operation we multiply by the square of two.

To enlarge three times diameters in two operations, the quantity required is the square root of three. To obtain this in practice it is only necessary to draw an equilateral triangle the side of which is twice the length of the two points chosen, and from one of the angles drop a perpendicular to the opposite side; this perpendicular represents the distance apart the two points should appear on the screen for the first operation. The most convenient way in practice, in this case, is to cut the figure out on paper and fold across, as may be done in the preceding and following cases, using the paper scale thus obtained for setting the camera.

The scale of four diameters, as previously hinted, presents no difficulties, as the square root of four is two.

Five is obtained by setting off one distance at a right angle to a line measuring two distances; the line completing the triangle gives the scale required.

To obtain six diameters it is first necessary to obtain the square root of two, as in the first instance, set this off at a right angle to a distance of two and complete the triangle for our required scale.

Seven in like manner is obtained by setting off the square root of three, as obtained in the second case given, at right angles to a distance of two.

The most convenient way of getting the scale for eight is not by combining the square roots of three and five, but by taking the diagonal of a square whose side measures two.

From this point most of the scales may be obtained in more than one way. The most convenient and simplest are here given. Nine presenting no difficulties we get:—

Ten.—A line joining co-ordinates of one and three.

Eleven.—The co-ordinates are the square root of two at right angles to three distances.

Twelve.—Three distances and the square root of three.

Thirteen.—Two distances and three distances.

Fourteen.—Three distances and the square root of five, obtained as already shown.

Fifteen.—The square roots of ten and five appear the simplest.

Seventeen.—One distance and four distances.

It is needless to proceed further, for any one who has followed me thus far will have already grasped the principle. Nor should I have written this much on the subject, but this simple and practical application of a geometrical proposition did not appear so self-evident, even to some to whom the proposition itself was A B C. I trust that I have made it sufficiently clear, although endeavouring to avoid diagrams which, unless really necessary, only, in such a matter as this, tend to scare away those whom one is most anxious to assist. The only question that can be raised against the usefulness of this little essay is: Is it desirable to make the positive intermediate in size between the original and the enlarged negative? This will depend, of course, as already hinted, on the size of the original and the grain of the deposit. The actual operator must decide that question from the subject he has to deal with. If the avoidance, as much as possible, of enlargement of the grain is at all a matter of moment, the method discussed here is the best and simplest: firstly, because the strictly proportional increase in the size must give the least granular appearance; secondly and chiefly, because only the one operation is required for the adjustment of the distances of negative (or positive in the second stage of the process) lens and ground glass.

Observatory, Cape Town. C. Ray Woods.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

XII.—Wiener (1899).

In Wiener's work on stationary waves,[1] he said that these waves might already have played a part, in an unrecognised way, in Daguerreotypy. Later observations[2] confirmed this dictum. He showed that there was a periodic sensitiveness of the Daguerrotype plate, with increasing thickness of the silver-iodide layer, with three maxima of sensitiveness; and there is a maximum where a *Bauch* of the stationary waves for the electric force lies in its surface.

He had not published these results because it was not decided

1. Whether the maxima *exactly* coincided with the *Bäuchen* of the electric force of the stationary waves.

2. Whether interferences of the common kind in the light passing through, which have their maxima at the same places as the standing waves, are the causes of the periodic sensitiveness.

3. For the case of connection between sensitiveness and standing waves, what was the explanation of the remarkable circumstance that the intensity of the light in the upper surface of the layer is authoritative for sensitiveness, while nevertheless it is first the silver substratum which conditions the high sensitiveness of Daguerre's plate.

These questions were answered by Hermann Scholl, who worked under Wiener's inspiration, in a Giessen inaugural dissertation, reprinted, with the exception of the introduction, in the "Annalen der Physik und Chemie" in 1899.[3]

Referring to Scholl's paper for fuller details on what is really a side issue of interference photochromy, and illustrates the somewhat unexpected significance of its principle in another branch of photography, we pass to the analysis of a long memoir of the same year by Wiener.[4]

In his researches on body-colour photography, Wiener came upon an error of Lippmann's method which had not been cleared up, and which was also of physical interest. That different colours appear on different sides of the plate was known, for example, to Meslin,[5] but hitherto the explanations were incorrect; the influence which the waves reflected back at the surface of the layer has on the colours had been overlooked, falsely judged, or denied.[6]

Cambridge, October, 1901. Philip E. B. Jourdain.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Second Notice.]

THE PICTORIAL SECTION.

The gallery devoted to pictorial photography, even in the sunshine of a bright October day, with its walls hung with photographs of subdued tones, with lustreless frames, has an air of decorous seriousness

[1] "Wied. Ann.," xl., p. 204.

[2] "Eine Beobachtung von Streifen beim Entwickeln belichteter Daguerre'scher Platten mit keilförmiger Jodsilberschicht." [March, 1899.] "Wied. Ann.," lxviii., 1899, pp 145–148. (The observations were made in 1890.)

[3] "Ueber Veränderungen von Jodsilber im Licht und den Daguerre'schen Process." [March, 1899.] "Wied. Ann.," lxviii., 1899, pp. 149–182.

[4] "Ursache und Beseitigung eines Fehlers bei der Lippmann'schen Farbenphotographie; zugleich ein Beitrag zu ihrer Theorie." [Leipzig, August, 1899.] "Wied. Ann.," lxix., 1899, pp. 488–530.

[5] "Ann. Phys. Chim." (6), xxvii., 1892, p. 389.

[6] As by Meslin, *loc. cit.*, p. 374.

which is symbolical of the earnest work which has been bestowed on the production of the pictures themselves. It is fortunate that a returning fashion once more permits a margin, either white or tinted, for without a spot of brightness here and there the walls would present quite a mournful appearance. The dark ground of the gallery was, of course, originally intended for the display of brilliantly coloured paintings in gilt frames, and, with these to brighten things up, a more suitable exhibition room could not be desired; but we must confess that, appreciative as we are of the need of restfulness and absence of competing details for the study of individual photographs, and an exhibition is held for that purpose, a little lighter and less sombre background would be desirable.

We have already given a list of the medalled pictures, and will commence our review by referring to them and the other pictures of their fortunate authors. The first medal, in the catalogue order, has been awarded to Percy Lewis for a "Street in Chioggia," which, in common with all Mr. Lewis' pictures, possesses that curious diffusion of focus which seems to be characteristic. The picture we are referring to is an admirable composition, a broad expanse of roadway is relieved by the presence of baskets and other appropriate items. There are figures in the distance, and one in the mid-distance, the upper part of which, unfortunately, almost merges into the house which forms its background. This is due, of course, to faulty tone values, the serious fault of the picture. Far better, in this respect, is "The Quayside, Chioggia," and the groups of figures are not only graceful, but natural. If there is a suspicion that photography has been helped, the result is so successful that it deprecates the means being too closely inquired into. "A Venetian Fruit-seller," while not so attractive as a somewhat similar Venetian scene in last year's Exhibition, is nevertheless a very pleasing picture, and the treatment is worthy of study by those who are likely to take canal views in Venice or elsewhere. "A Misty Morning, Venice," is forcible, yet delicate. "Seine Fishers at Work" is a satisfactory group of men and boats, and, though a well-worn subject, Mr. Lewis' distinctive touch invests it with a novel interest.

"The Quarry Team" of Archibald Cochrane is his only exhibit. A rather long and narrow picture, a waggon and team with a background of hedgerow and trees. It is an excellent subject, and the composition good. It is subdued in tone, and not without a sense of action. In spite of these and other desirable qualities it is not a quite convincing work. The background seems unnaturally regular, as if it had been supplied with a brush, and the tone values are not beyond criticism. What is evidently a gleam of sunlight falls upon the waggon, but no sense of sunshine is suggested, and in some of the darker parts details become merged in a way impossible in daylight.

James Auld's "Study of a Head" will raise a controversy as to its merits. It is the head of a lady, in full face, a fine head with well-marked individuality, but not very comely, and the bare shoulders have their anatomy perhaps too strongly marked. The treatment of the subject is certainly not commonplace. The size of the picture is about 10×12, and it has a curious suggestiveness of an oil painting in monochrome, which the strange waxen texture of the flesh and the pale yellow tint of the print support, moreover its obvious faults seem to be those of the brush rather than those of the camera. Whatever opinion may be formed of its merit, it is a work that no one can pass without notice. "Devotion," the head of a Sister of Mercy or nun, is entirely differently treated. The contrast of the sweetness of the face and expression of the subject with the almost straight and severe lines of her hood, is quite suggestive of the title.

"An Old Kitchen," by Bernard Moore, has its subject sufficiently indicated by its title. A cottage interior, quaint in its old-time air; an admirable little photograph with that delightful luminosity in the shadows that seems to be the particular characteristic of a transparency on glass backed with paper.

W. Gill's medalled picture "The Spinet" is one of those dainty little figure studies in which he excels. It is the back view of a lady, very low in tone, but with a wonderful transparency in the shadows, and the white drapery treated admirably. Perhaps a trifle more brilliancy would not have been disadvantageous, but it is so nearly perfect as it is that it is a pity to suggest alteration. "Winter Sunshine" is another graceful figure study of a lady standing by a window, through which the sun streams, its beams falling partly on her white dress and partly on the wall. Truly a difficult condition of things to manage successfully. Mr. Gill has entirely succeeded. "In the Gloaming" introduces the spinet again, and the lady playing it has for the background of her head a window covered with a muslin curtain. Such a subject undertaken without unusual skill results in a silhouette, but, in this case the face, though of course dark, has all the detail preserved. A departure from Mr. Gill's accustomed manner is entitled "A Study of a Head." It is a vignetted head of a youthful lady, and in its lightness and delicacy, almost suggests a pencil drawing. It is a charming head delightfully treated.

We have now exhausted the list of the medallists. W. T. Greatback entitles his principal work "The Reaper." As a composition it leaves little to be desired. The figure is well posed, well placed in the canvas, and is fairly suggestive of the appropriate action. Possibly to have made the figure somewhat larger, and even a little more boldly marked, would have been better, as the interest now is a little too equally divided between the figure and the landscape. The foreground is the weakest part of the picture, it is sufficiently out of focus to be distressing to look at, and the exaggeration in size of its details almost amounts to distortion. A rather cooler tint, or at any rate a more pleasant brown for the print, would be an improvement. "A Mill Stream" contains so much below the horizon line that it is nearly all stream; it amounts to eccentricity, but the picture has many good points. The crooked tree-trunks in "When the Leaves have Fallen" are strongly reminiscent of those represented in last year's medalled picture, but this picture is far below that standard. "Autumn Mists" is not a picture we can admire. That the atmospheric conditions suggested by the title are not fully borne out by the picture perhaps matters very little, but the better the acquaintance the more are undesirable points in the composition revealed. At the last our view was dominated by a triangle of dark spots made by a bush or sedges in the centre, and two masses on the horizon. Three pictures of Indian scenery, by C. C. Branch, will attract the attention of every visitor, not only on account of their subjects, but because they are such perfect specimens of what is nowadays somewhat depreciatingly called good technical photography. They are evidently carbon enlargements, and are certainly not without pictorial interest. "Jagdes Temple, Udaipur," is a marvellous rendering of white stone under the brilliant sunshine of an Indian sky. There is a fine effect of reflected light, revealing distinctly the most minute detail in the shadow parts. "Burning Ghat, Benares, is hardly so successful as a picture, although, when closely looked into, the subject itself is an interesting one. The picture includes rather a wide angle, and it lacks breadth. The "Maharana's Elephant" is another scene of brilliant sunshine, and, pictorially, it is the best picture of the three. Again, the effect of sunlight is perfectly rendered, and with that transparency in the shadows which is to be seen always in nature, but rarely in a photograph. The elephant, in forming a centre of interest for the picture, helps it materially. J. B. B. Wellington's work is rather disappointing. "Evening on the River" is a sufficiently good subject, but it is not a satisfactory picture, being almost entirely wanting in aerial perspective; for example, a bush in the foreground entirely merges into the verdure of the river's opposite bank in the mid-distance. "Arundel Castle" is much more pleasing, and it is an arrangement of some originality. The idea has hardly been carried out so well as it might have been. The left of the picture, including a group of trees, required the utmost skill to prevent that portion becoming detached and forming a centre of interest of its own. This skill Mr. Wellington has failed to exercise. The defect arises in the printing, and is not an inherent one. Remedied, the picture may become another of Mr. Wellington's successes. W. Smedley Aston's "Miss Neilson as Constance" is a powerful, but not altogether pleasing portrait. The method of lighting has resulted in the face having a curious hard appearance, and being, as it is, surrounded with strongly contrasting tones, there is a suggestion of a mask rather than of a human face. "Marianna," in a robe with figured sleeves against a wall covered with a particularly fireworky paper, and with a striped headgear, is too lacking in repose to create a very pleasant impression; nevertheless there are clever points in it. F. A. Bolton has four figure subjects which are all treated with quietness and restraint. The most important is a full-length figure of a boy with a flute, which, like the others, is full of good modelling, and soft in effect.

J. H. Anderson has two "Birch and Bracken" studies of which, on

the whole, that entitled "Nature's Graces" seems the better. The other, though an effective composition and agreeable in light and shade, has a peculiar appearance of woolliness in the foreground bracken which is not pleasant. Robert Bourke chooses the same theme, but he has not treated his pictures in the same forcible manner. "Adel Wood" is distinctly the better of the two, but it seems to want more force in the foreground. "Grey Weather," by W. Thomas, also a birch and bracken subject, suffers from the greyness of its foreground, which is not strong enough to make the distance duly recede. "River Mists," by the same author, is extremely soft and delicate, but it is not convincing. It suffers from the same defect, want of correct proportionate value of the tones of foreground and distance; and again the same characterises Mr. Thomas' other picture, "Chill October." In this there is good feeling, and the subject, though slight, is sufficient; nevertheless it can hardly be counted a success.

Of those exhibitors who confine their attention to architecture, C. H. Oakden's two cathedral interiors, though not possessing any points which call for descriptive notice, are quite equal to his usual good form. H. W. Bennett has a remarkable subject in "An Old Church." A strong ray of sunshine from the open door falls diagonally across the pavement, strongly contrasting with the deepest tone of the picture. It is a difficult subject wonderfully well handled. S. B. Bolas and Company have two rather dark interiors carefully treated, but not remarkable in any way. "Old College, York," by Chas. F. Gare, is another careful work, but it misses the sparkle of sunlight. John H. Gear has two fine examples of cathedral interiors, both of St. Mark's, Venice. One presents a striking effect of brilliant lighting and deep shadow; the other a more subdued effect. Both are remarkable for the preservation of luminosity even in the deepest shadows. S. Giorgio Maggiore, Venice, a view of the buildings across the canal, with a gondola in the foreground, is equally successful in its way. F. H. Evans has three architectural studies which have his distinctive delicacy of touch, and they are also examples of his habit of placing a brightly lit or a very weak portion of the picture against a margin.

"As in Algiers," a figure subject, also by Mr. Evans, is a delightful study. We can imagine it to realise just the kind of result that many of the more extravagant of the figure studies and portraits in the Gallery are aimed at. It is diffused in focus without loss of texture. It has deep shadows and telling high lights. The arrangement of the drapery is most graceful, and altogether it will add to Mr. Evans' already great reputation. In a portrait of Mr. T. R. Dallmeyer, F.R.A.S., the President of the Society, Mr. Evans has not scored an unqualified success. It is undeniably a good likeness, but not a complimentary one, and the effect of the lighting is not altogether pleasant. Far better is the portrait of Mr. A. C. R. Carter. W. Crooke is represented by one portrait of comparatively large size, which is full of dignity and most simply treated. It is worthy of its author. H. Walter Barnett is hardly represented at his best. The "Portrait of a Lady" is recognisably in his style, but it is not of the importance, neither is it so pleasing as his portraits of last year. Really, the figure is somewhat awkwardly posed, and the raised arm makes, with the stiffly outstretched fingers, an unpleasant angle. "Lord Milner of Capetown" is interesting on account of the subject, but there is nothing about it characteristic of its author. It is, however, quiet and acceptable as a picture. R. Fellows Willson has two graceful portraits of ladies quite equal to his reputation. "A Head Study," by John Moffat, is admirable in every way. "A Portrait of a Gentleman," by T. Fitzgibbon Forde, is excellent in lighting and well-modelled. "A Puritan Maiden," by the same author, is marked by the same good qualities, and it is one of the few examples in the Gallery of the employment of a fancy frame. In this case the whole get up is admirable.

American photographers are well represented. E. J. Steichen's work is, as one would expect, characterised by his well-marked individuality, or rather mannerism. He still adopts eccentric styles of mounting and of placing the subjects in his pictures, and while recognising that there is much in his work that is both good and original, we are bound to recognise also that his originality is not always good. That of his works which will lead to most differences of opinion is entitled "Solitude," a fine head of a man, the upper part obscured by the shade from the brim of the hat, which is intentionally cut through in the trimming of the print. The chin is supported by the left hand with outstretched fingers. The effect of light and shade is undeniably good, but, as we have indicated, it is quite a controversial picture. We make a mild protest against the unnecessary amplitude of the mount. "Thistles," a gum bichromate of the more ordinary kind of treatment, is also marked by the same excess of mount. It is not free from technical defects which might have been avoided, but is not unpleasingly suggestive. Two portraits, those of J. W. Alexander and Mons. Alphonse Mucha, though not similar in treatment, are alike in seeming to be meant to render it difficult to recognise the originals. "The Lady of the White Heart," doubtless so christened from the shape of the white facing of the lady's dress, may be most aptly described as whimsical. C. Yarnall Abbott's "May Queen" appears to be a lackadaisical creature, and very far from realising our ideal of a May queen. "Dorothy" is a not unpleasingly treated head, but it does not rise above mediocrity, and the same may be said of a portrait of Mr. H. M. Watts. "Le Stryge, Notre Dame," by A. L. Coburn, is striking in its quaintness of subject. F. Holland Day has two Algerian figure subjects, neither of which is likely to rouse anybody to enthusiasm. Dr. F. Detlefsen's three child studies are acceptable. R. Eickemeyer's "The Bridal Rose" is, to our mind, one of the most charming pictures in the Exhibition. He has been most fortunate in his model, but the graceful pose of the half-length figure, the arrangement of the hands, the flowing hair, the drapery, and the treatment generally are the author's design, and they bear eloquent witness to his skill. Frank Eugene's "Song of the Lily" is a well arranged figure representing a faun playing pandean pipes. A portrait of Lady C. might almost be a portrait of a bedpost. It is so dark and obscure that it is difficult to make out what it is intended for. "A Portrait," by Dudley Hoyt, merits attention on account of its curious lighting. It is forcible, and by no means unattractive. Arthur Hewitt has no less than nine exhibits, all of which are marked by simplicity and directness of treatment. Two portraits of President Roosevelt will be of particular interest at the present time. An American chief of police and A. Jahn, of Dresden, are straightforward work that every one can appreciate. Perhaps the most taking work is a picture of little child holding a ball. "The Deserted Cottage" is not quite satisfactory on account of its want of strength in the foreground. The title of H. C. Rubicam's "Negligé" probably arises from the lock of hair which strays across the face of the lady subject, who otherwise appears perfectly neat. The conceit is pretty enough, but unfortunately the wandering lock is not a very graceful one, and the suggestion is rather that of untidiness than abandon. The head is placed low down in the picture, for which no adequate reason is apparent "Miss H." is a good head, and except that the flesh shadows, between the lips for instance, are too heavy, is well treated. Miss Mathilde Weil sends half a dozen little pictures that could hardly be mistaken for the work of any one else. Her works are either pitched in a very low key or a very high one. "Mrs. G." is one of the former, and is a quiet dignified portrait. In "A Schoolboy" the same low key is adopted, but it is not so successful. "Hydrangeas" is aptly named, for though there is a child, it is hardly to be distinguished from the pots of flowers. The picture has the merit, however, of giving a very charming and unusual effect of sunlight. In "Lisbeth," a child at a piano, the high key is clearly misleading. One cannot conceive the absence of deep shadow possible under the conditions.

Pierre Dubreuil's "Le Volant," two children playing at battledore, is a very dainty work, with a taking scheme of lighting. The pink tint of the print, however, is not quite satisfactory. "Reverie" is simple and generally satisfactory, but close attention reveals that the lady appears to have something the matter with one eye. This effect occurs through an incident in the arrangement. "Mater Dolorosa" is a fine strong work, but is not the year 1901 rather late to trot out a representation of a wall upon which hangs a framed picture with a section of a figure at the margin? The work of Jean Lacroix, of Geneva, in gum bichromate will doubtless find many admirers, and it is indeed well worthy of study. The several landscapes, though not of equal merit, are full of feeling, and are all interesting, but the most attractive picture is a "Portrait du Graveur Desboutin," which has all the qualities of a fine engraving, and it could easily be mistaken for such. The subject is so fine, and the arrangement so perfect in every detail, that but for the words "d'après nature," which appear upon the mount, it is difficult to realise that it is not a copy of a painting. G. H. Emmerich, of Munich, has four pictures in gum bichromate, but, in his hands, the medium gives a totally different

result. In these the pigment is as unbroken and as continuous as in an ordinary carbon print, and the shadows possess the same glaze. We think his most successful picture is "Poplars—Evening," in which he has a fine subject presented with a force that commands attention. "A Mill on the Elbe" is also a good subject, but in this case the values are lost, and there is a flatness and want of relief quite impossible in the sunshine which evidently existed at the time.

James B. Johnston has a peculiar effect in "From the Shade of the Willows." The tint of the paper upon which the print is made suggests a yellow fog, but it is an interesting picture in spite of some faults of composition. J. Page Croft does not seem to have kept pace with the times. "Outposts" seems to be a survival of the time when extreme diffusion, even without a purpose, was assumed to be the sign of artistic ability. Still, with better management, it might have been a good thing; as it is, it is woefully deficient in true tone values. "The Bend in the River" is better, but the lower half is not only too monotonous, but is obscure in meaning. Two figure subjects in eccentric frames are not inspiring works.

A somewhat ambitious picture by David Blount represents a girl holding a bunch of the plant called Honesty, which word is the title of the picture. It is a half-circle in shape, and is framed in a metal and wood frame, which is quaint and not inappropriate. The conception is good, and the composition not unpleasing, but it suffers from undue blackness in the shadows, especially of the face. The print is gum bichromate. "Her First Grief" seems to represent a girl asleep with her head resting upon outstretched arms. In spite of the not too graceful disposition of the arms, it is not without attractive features. Its worst point is the injudicious washing out of lights. "A Daughter of Eve" is a head of a very sweet child. It is almost perfect, but the complete merging of one side of the head into the background is unfortunate.

"Alas, alas! for the Winter's Snows," by W. Rawlings, represents a field of snow, untrodden except by the feet of a flock of sheep making their way in single file across it. The sheep, their footprints, one little bush, the broad expanse of snow, and a lightly clouded sky make up the picture which is delightful in its breadth, simplicity, and the tenderness of its gradations of tone. In "Whitby Harbour, Winter," the rainy clouds, the smoke-laden distance, and the sloppy roadway tell the story perfectly. Three architectural works are sound photography of well-selected subjects. John H. Gash has a magnificent subject in "A Yorkshire Dale," but he has not risen to the occasion. He has made the foreground, which required the utmost strength, of nearly the same tone as the middle distance; hence his planes are merged in confusion. He is unfortunate, too, in his treatment of "A Quiet Corner," which, however, under any circumstances, would have been spoilt by the blue mount. W. A. J. Hensler's most attractive work is entitled "The Thaw," a harbour scene under snow. The aspect is so peculiarly bleak that the title is hardly suggested. As a snow picture, however, it is decidedly a success. Two architectural works by the same artist are good, though one is rather spotty. Joseph Appleby sends some bold seascape studies. There is a fine effect of breaking waves in "A Sou'wester," marred, however, by the unnatural blackness of the shadows and the patchiness of the print. A seapiece with a poetic title is entirely successful in conveying a sense of waves in motion. Of several agricultural scenes, by C. F. Grindrod, "Ploughing on the Upland" is the best conception. The figures are big and bold, and the action good, but the distance is very badly kept. A very much better thing is "Carting Kelp," in which the dark horse and cart tells with splendid effect against the light sand and sky. W. J. Croall's "Waiting for the Guns," a gamekeeper and dogs, is a well-managed composition, but a trifle heavy in the shadows. "Evening on the Sand Dunes" is admirably treated, and full of breadth.

Mr. F. W. Fielder, in "The Spirit of the Marsh," makes a bold attempt at a creative work. It is not quite convincing, but is a praiseworthy effort. The candle is so obviously touched in that we are brought to stern realities at once. Chas. F. Inston has a seapiece in his best style, perfect in its sense of atmosphere, and rendered with that delicacy and breadth which are characteristic of his later work. Furley Lewis has a strong work in "Un maître d'armes—Portrait of Mons. Felix Gravé." The pose is natural and effective, and the line made by the sword useful. The "Portrait of George Scamell, Esq.," Treasurer of the Society, is a characteristic one, and a figure subject entitled "Suspicion" is sufficiently well stage-managed to pass without suspicion.

In still-life subjects, R. R. Rawkins presents a very nicely treated "Decorative Panel," a branch of hawthorn with blossoms. J. M. Whitehead's studies of fruit are delightful in their arrangement and lighting. His woodland scene is quite a masterpiece of skilful management of light and shade. Equally pleasing is "The Close of a Sultry Day," with its admirable rendering of the trees and the distant village, on which floats a smoky haze.

James Taylor's "Toilers of the Sea" is one of the best of the quayside subjects. "A May Meadow," by J. P. W. Goodwin is good, but would have been better treated with a little more delicacy. Hector E. Murchison's two little landscapes show excellent feeling. Dr. E. G. Boon has attempted to repeat the effect of his medal picture of two years ago, but not with the same success. Miss Agnes Warburg shows much feeling in "A Flood in the Plain," and her "Archway at Valbonore" is daintily presented. "Off the Dutch Coast," by S. L. Coulthurst, is a very taking little picture. Alfred Werner gives us an example of his best work in a portrait. J. C. S. Mummery's "Heathland" is refined, as all his work is, but not, we consider, equal in interest to much that he has sent here in times gone by. Miss Essie Collins sends two good negro studies and other meritorious work. Mrs. Middleton Rogers, better known as Miss Muriel Bell, and Miss Evelyn Boden are each represented by one picture strongly reminiscent of work they have previously shown. James Gale's landscape, with sheep, of course, entitled "Springtime" has some good points; the feeling is good, and, allowing for the natural disinclination of sheep to go where they are wanted, he has made the best of his subject.

We are aware that we have passed many pictures that well deserve notice. To enumerate all the good things would be to reproduce the catalogue. That a picture appears on the wall of the Exhibition is in itself a certificate that it possesses some merit.

In a third and concluding notice we shall deal with the Professional Section.

OVERHEARD AT THE R.P.S. EXHIBITION.

In Fountain Court. Two Young Ladies, standing vaguely in centre, examining catalogue with interest.

First Y. L.—"Oh, I can't find the number of George's picture anywhere. I know it's called 'A Trembling Evening,' or—or something."

Second Y. L.—"Isn't there a list of exhibitors at the end?"

First Y. L. (after turning over leaves anxiously): "So there is! I should never have thought of that; how clever of you! And—and, do look, here is George's name in print! He must be proud."

[They are both silent for a moment—the silence of awe and astonishment commingled—at this discovery; but presently it strikes them that, as they have come, they might look for George's exhibit as well as its number. They find it at length.

Second Y. L. (examining the work of art with critical but approving eyes): "How beautiful! But why does he call it 'A Trembling Evening,' I wonder?"

First Y.L. (quickly): "Oh, because ——— (blushes and becomes incoherent).

Second Y. L. (with arch innocence): "I believe you know where the glade is—you might tell me?"

First Y. L. (rather lamely): "I think perhaps it is somewhere in—in Devonshire; I'm not sure, but I ——— (hurriedly) I think we ought to be going now, don't you?"

Second Y. L. (surprised): "Why, don't you want to look at any others?"

First Y. L. (with much fervour): "Of course, I should love to, but you know we promised to go to tea with ——— "

[They leave, talking.

In the Balcony

(where the scientific and general technical work is exhibited).

Facetious Youth is trotting round his Best Girl. They stop opposite an enlargement of an unpleasant-looking larva.

B. G. (looking up larva in catalogue, reads aloud): "Larva of Oxypi——Oh, I can't pronounce that, anyway it infests some part—I can't make out what—of the hartebeest——."

F. Y. (who is glancing over her shoulder, interrupting): "I gnu it did! Do you see, gnu—knew? Ha, ha! Do you see the point?"

B. G. (doubtfully): "Y—yes, but the two words are spelt differently!"

F. Y. (not at all abashed, turns to clever exhibit near by): "Ah,

this is more in my line. Look at those two jolly snails making love. (Struck by a sudden connective idea): Let's go to the tea-room!"

B. G.: "Oh, Charles!"

[They retire arm-in-arm.

In the Selected Pictorial Section.

Irate Old Gentleman to the world in general.

I. O. G.: "Perfectly disgraceful, I call it! Look at the stuff hung on these walls, I say, look at it! And yet my gem, that was admired by an R.A., has been rejected! (Glares at Inoffensive Onlooker, and suddenly addresses him): Yes, sir, a mixture of incompetence and favouritism; that's what it is! Where's the Secretary?"

I. O. (nervously): "I don't ——"

I. O. G.: "Don't answer me, sir! I ask you where is the Secretary or President? What, don't you know? Then why didn't you say so, instead of wasting my time!"

I. O.: "How should I know? I am only a visitor."

I. O. G. (crushingly): "Then you have no right to look like an official; another instance of mismanagement!"

[Hurries off to try and find the Secretary.

In the South Room.

Meek Man, Well-Informed Wife, and Small Boy, who seems to be called Augustus, are standing in centre.

M. M.: "Well, I've had about enough. Make's my head ache, so much staring."

W. I. W.: "I never knew such a man! Why, I don't get tired looking at pictures."

M. M. (with unconscious sarcasm): "But they aren't pictures, they're photographs."

W. I. W.: "It's no good taking you anywhere; you never take a proper interest. I can't make out why you ever leaves Balham; you're quite content in the back garden; never wants to improve your mind, nor—nor nothing!" (M. M. sighs wearily. W. I. W. catches sight of large portrait of Miss Clara Butt.) "Why, there's the Empress of Russia! Exactly like her too, poor thing! How well I remember, in 1894—no, it must have been in 1895, because, don't you recollect?—Aunt Mary was ——"

[Enters into many reminiscent details, which are rudely broken by shrieks from Augustus, who has fallen on the uncommonly slippery floor. He is only pacified by the promise of a large bun with comfits on the top. They leave the Exhibition in search of this delicacy. It is to be hoped they found it, for—well, Augustus looked as if he could be very firm.

In Most of the Rooms.

"It is a good show as a whole."

T. A. GERALD STRICKLAND.

Our Editorial Table.

THE LUMIERE DRY PLATES.

WE have received samples of these dry plates from the Lumière N.A. Co., Ltd., 78, Queen Victoria-street, London, and have had much pleasure in testing them. The plates are issued in four series. The Extra rapid is a very sensitive plate, without special claim for orthochromatic properties, but it has proved to be a very popular brand, and, judging from the fine grain and long range of gradation of the sample, we can well understand the partiality of a large number of photographers for this brand. The other three series are colour sensitive plates, Series A being sensitive to yellow and green light, Series B to yellow and red, and Series C, or the panchromatic, to red, yellow, and green. To obtain the full advantage of the colour sensitiveness of these three series a yellow screen should be used. These are supplied by Messrs. Lumière at very moderate prices, and they are of specially selected coloured glass. We made a series of exposures upon a group of flowers and other coloured objects combining red, green, blue, yellow, purple, and other shades of colour, and obtained some excellent negatives, showing a clearly marked selective action in each case. As in the Extra Rapid, so also in these colour-sensitive series, the grain was particularly fine and the gradation very delicate and extensive. We found perfect freedom from fog, and were particularly impressed with the rapidity of fixation. The glass is excellent in quality, and the coating of the plates very even and free from defects. The thought occurred to us that we had a broken box of the B series, which had been on a shelf in the dark room for some years, and we took the opportunity to expose one of these plates as a test of their keeping quality. We cannot fix the date when these plates came into our hands, but the box bears the batch number 1612, whilst the sample box we have just received is numbered 18,486. The plate was exposed under a negative, and a strip of non-actinic paper placed between the negative and plate, so that any fog due to age might be detected. The exposure was a very full one, but the protected part gave clear glass, and the general character of the positive shows that the plate had kept excellently well. Now that Messrs. Lumière have established themselves upon the London market, we think their plates should soon command a large sale in this country.

CHRISTMAS AND NEW YEAR MOUNTS.

Sold by George Houghton & Sons, 88 and 89, High Holborn, W.C.

MESSRS. HOUGHTON are issuing a special twenty-two-page list devoted to their Christmas and New Year mounts. There are nearly fifty illustrations of the various styles, so that the amateur or professional photographer is offered a very wide choice indeed. A feature is made of assorted sets of cards, and one of the boxes has been sent to us for inspection. The card mounts are pretty and refined, and the inscribed sentiments are brief but seasonable. Messrs. Houghton should have a brisk sale for these pleasing cards, as the end-year custom of exchanging photographic greetings with one's friends is spreading.

THE ROTOGRAPH BROMIDE PAPERS.

Manufactured by the Rotary Photographic Company, Limited, 14, New Union-street, Moorfields, E.C.

RECENT trials of the bromide papers, manufactured by this Company, satisfy us that the favourable estimate we formed some months ago of the qualities of those printing surfaces does not need revision. In particular we are pleased with the grade which yields a pure dead black in the shadows. A recent frontispiece of the "Bromide Monthly" contains a very fine specimen print indeed on this paper. It is a portrait of Mr. E. B. Core, the President of this year's American Photographic Convention. The deposit closely resembles pigmentary platinum in its richest form. We are interested to learn that ferrous oxalate is used by the Company in the development of the prints on Rotograph bromide papers, which are made in the United States and Germany as well as in England.

THE "Architectural Review" for October, published at Effingham House, Arundel-street, Strand, W.C., contains, as its chief feature, an article on "The Architect of Newgate," by Mr. Reginald Blomfield. The half-tone illustrations are mostly from negatives made by Mr. Edwin Dockree, who has secured some technically fine renderings of the grim old prison that is soon to disappear; and also pictures of All Hallows, London Wall; St. Luke's Hospital, &c. Mr. Dockree's architectural work is not excelled by any photographer of our acquaintance, and in the illustrations before us he is at his best. We can strongly recommend this number of the "Architectural Review" to those lovers of Old London who may wish to preserve some record of such a deeply interesting place as the line of dark buildings on the eastern side of the Old Bailey. Mr. Blomfield's article, of course, appeals to architects; but there are doubtless many others who will be pleased to possess this number of the "Review" on account of its fine photographic studies of the prison where Dickens's hangman, in "Barnaby Rudge,' so gleefully "worked off" his victims.

"SOUVENIR of my Holiday' s the title given by Mr. W. Tylar, of 41, High-street, Aston New Town, Birmingham to a paper-covered album which he is issuing for the use of amateur photographers and others who may desire to make small collections of prints obtained from negatives produced during a holiday or at any other time. There are bordered spaces for half-plate, quarter-plate, and smaller prints.

MESSRS. CASSELL & Co., Limited, of La Belle Sauvage, Ludgate-hill E.C., have commenced the issue in sixpenny parts of "The Nation' Pictures," selected from well-known galleries in Great Britain. The part before us contains three-colour reproductions of Edwin Abbey's "O, Mistress Mine," Alfred East's "Autumn," Maurice Greiffenhagen's "An Idyll," and Orchardson's "Napoleon on Board the 'Bellerophon.'" The quality of the printing is not uniform throughout these examples, the colours of the last-named reproduction being out of registration, but the other results encourage the hope that Messrs. Cassell's venture may be successful.

News and Notes.

THE annual general meeting of the Photographic Copyright Union will be held on Tuesday evening, October 15, at the Imperial Restaurant, 60 and 62, Regent-street, W., at 8 o'clock.

MESSRS. J. J. Griffin and Sons, Limited, of 20-26, Sardinia-street, Lincoln's-Inn-Fields, W.C., ask us to state that they have extended the time for receiving photographs for their planiscope supplementary lens competition until the 31st of December of this year.

LEICESTER Literary and Philosophical Society. Section G, Photography.—A meeting of the above Society was held on Friday evening last, when a Lecture by Mr. Sutcliffe, of Whitby, was delivered, entitled, "Seaside Photography." A series of very fine lantern slides were exhibited and much appreciated.

LADY Exhibitors at The Royal.—In no previous exhibition of the Royal Photographic Society do we remember so many works being shown by lady photographers as in the present one. In the pictorial section the catalogue shows us that just ten per cent. of the exhibits are by members of the fair sex, and the fact deserves to be chronicled. No lady worker has been awarded a medal this year. Let them not be discouraged, however, on that account, as some of the work shown by them is of a high degree of merit. Next year we shall hope to see the ladies participating in the medal awards.

THE Polytechnic Photographic Trades School, Regent-street, London.—The following is the programme of the opening night of the Polytechnic School, on Tuesday, October 15, 1901. Mr. Thomas Bedding, F.R.P.S., President Professional Photographers' Association, Editor "British Journal of Photography," will preside:—7.30, Conversazione. 8, Display of the latest animated photographs, including the New Steering Balloons, a Trip through the River, the Naval Manœuvres, the Motor Car Races, etc. 8.20, Remarks on the ensuing session, and lecture by Mr. Howard Farmer, entitled, "A Threatened Blow to the Trade: or, Work for the New Professional Association." During the lecture a demonstration of "Proofs at the time of Sitting" will be given. 8.40, Remarks by the Chairman. Admission is free to photographers, artists, engravers, and those interested in those trades.

THE Professional Photographers' Association.—We have been interested to observe the remarkable growth of the Professional Photographers' Association, which now numbers over four hundred members and is "still growing." Our contemporary, THE BRITISH JOURNAL OF PHOTOGRAPHY, in commenting on the flourishing standing that this Association has reached, cites the case of the Deutscher Photographen-Verein, which, after a quarter of a century's fairly steady growth, has reached a membership of between eight and nine hundred. It was not until after an existence of nine years that the German body, starting with a membership of thirty-five, had reached the dimensions which the British Photographers' Association attained in July last, after an existence of only three months. We have but to add an expression of the earnest wish that "organization" may continue to develop and prosper in every branch of our Craft.—"The Optician."

THE Hove Camera Club's Sixth Annual Exhibition will be held at the Town Hall, Hove, on Thursday, Friday and Saturday, November 21, 22, and 23, 1901. The Judges are: Messrs. Charles Job, F.R.P.S., E. E. Manwaring, and F. Davey. The following are the Open Classes—Awards: Silver and Bronze Medals and Certificates in each Class (A—H). Prints.—Landscape, River Scenery and Marine. Silver Medal, presented by Alderman J. Colman, J.P. Figure, Portraiture, and Animal Studies. Silver Medal, presented by the Hon. Secretary. Architecture—Interior and Exterior. Any other subject than the above. Bronze Medal, presented by C. Job, Esq. A set or sets of four pictures by amateurs who have never gained an award in photography. Silver Medal, presented by Mrs. A. O. Jennings. Lantern Slides (in sets of four): Landscape, river scenery and marine. Figure, portraiture, and animal studies. Architecture and any other subject not belonging to the two preceding classes. Not for competition: Pictures or lanterns slides. Entry forms and further particulars can be obtained from the Hon. Secretary, Mr. A. R. Sargeant, 55, The Drive, Hove.

IN a paper read by Arthur R. Hinks before the British Association, Glasgow Meeting, 1901, on the possibility of systematic error in photographs of a moving object, he said: "As a preliminary to the discussion for a determination of the Solar Parallax of a series of photographs of the planet Eros, made last winter by the author at Cambridge Observatory, it was essential to assure one's self that no systematic error was produced by the motion of the planet during the exposure (generally three or two minutes). Two series of plates were taken—(a) with stars fixed and planet trailing; (b) with planet fixed and stars trailing. It is easy to imagine how such an error might arise. Owing to atmospheric disturbance, the image of a star during exposure is buzzing about on the plate around its mean position. The developable image is thereby enlarged, and a larger area still on the sensitive film is prepared for decomposition, just as very sensitive plates are prepared by preliminary exposure to faint light. Consequently, if the image is trailing on the plate, it is trailing on to a surface already prepared to the point of decomposition, and it seems possible that the centre of the developed image might therefore be in advance of its true place. The author shows (1) that if such an effect were independent of the magnitude of the star, the two series (a) and (b) would be rigorously comparable with one another, but each would give the place of the planet with respect to the stars ahead of its true position by the same amount; (2) that it is almost certain, however, that the effect would depend on the brightness of the star; (3) that a comparison of the two series of plates gives no evidence of the existence of a differential effect varying with the magnitude of the star; and (4) that the absolute error is therefore probably also insignificant."

PHOTOGRAPHY in Fires.—On Monday, October 7, at the Camera Club, Mr. Ellis Marsland, Chairman of the Testing Committee of the British Fire Prevention Committee, gave a paper on the subject of the uses of photography in recording the progress of fires and fire tests. In the first part of his address Mr. Marsland described two big fires—the destruction of the Hotel Windsor, New York, and the fire at the Entrepôt Royal, Antwerp. The New York fire took place in March, 1890, and the whole of the hotel was burnt, many lives being lost. The progress of the conflagration, from the time when the smoke was first seen coming out of the windows of the upper stories to the time when the whole building was in ruins, was shown by illustration. In the case of the Entrepôt Royal at Antwerp, which was burnt to the ground on June 5 this year, nearly fifty slides were shown, and those present were able to see how the flames spread from one block to another. The second part, perhaps the more interesting of the two, related to the tests which the British Fire Prevention Committee have been applying to doors of various thickness and material to ascertain the powers they possess of resistance to fire. Photographs were taken during the progress of the tests, and among the doors burnt were those made of deal, poplar, walnut, oak, and teak. It seems that the resistance to fire depends not so much on the material as on the manner in which the door is made. A deal door of three thicknesses of wood, the two outside pieces being vertical and the inside piece horizontal, and nailed together with wooden pegs, kept the fire back a longer time than did a door made in the ordinary way of teak. Tests with iron and steel doors showed that the effectiveness of a metal door lay in its being firmly secured at each corner and in the middle by strong bolts to prevent the iron or steel bending when red hot.

Commercial & Legal Intelligence.

WE have received a price list of developing, bromide and carbon enlargements, printing, lantern slides, etc., issued by the Rothwell Photographic Materials Company, 8 and 10, St. Mary's-street, Deansgate, Manchester.

MESSRS. Morley and Cooper announce that, as from September 29, 1901, they will carry on their business at their new and more commodious premises, 271, Upper-street, London, N., to which address all communications should be sent.

PHOTOGRAPHS of Foreign Cathedrals.—Referring to the recent query of a correspondent ("H. C. D.") on this subject, Messrs. J. Mallia and Co., the Grand Studio, 268, Strada Reale, Valetta, Malta, write to say that they can supply views of cathedrals at Malta and Gozo, and procure views of cathedrals in Sicily and Italy.

MUTOSCOPE Pictures.—Joseph Cowley, agent of the Mutoscope Company, was summoned at the Newcastle Police-court last week to show cause why certain pictures should not, on account of their obscene nature, be destroyed by the police. The pictures in question, according to the evidence given by Superintendent Fyfe and Sergeant Besgick, were shown in one of the mutoscopes in the hall of the old art gallery, Grainger-street. When the sergeant visited the pictures, the charge for viewing which was 1d., there was a small boy in attendance, who said the pictures labelled "The Artist's Model" and "Special Extra," had been on show for about a month, whereas the defendant said he had shown the pictures for over a year without any objection having been made. Cowley said he did not think that the pictures could be objected to. Sir Riley Lord said the Bench had examined the pictures. They did not object simply to the nudity of the figure, but they considered that the suggestion conveyed was decidedly obscene and most immoral in its tendency, and an order would be made for their destruction. Upon this decision Cowley pleaded "Guilty" to having unlawfully and wilfully exposed the pictures, and in extenuation he said the description "Special Extra" had been placed on the pictures by the boy who was assisting him without his knowledge or consent. A fine of £5 and costs, with an alternative of one month's imprisonment, was imposed.

Patent News.

THE following applications for Patents were made between September 23 and September 28, 1901:—

ROLL FILMS.—No. 18,970. "An Improvement in Photographic Roll Films." (Communicated by Actiengesellschaft für Anilin Fabrikation, Germany.) CHARLES DENTON ABEL.

SHEATHS.—No. 19,003. "Daylight Sheaths." WILLIAM LESLIE ROSS.

ROTATORY PHOTOGRAPHY.—No. 19,016. "A Governing Disc which controls the Rotating Photographic Disc on which a number of Photographs are taken in Rings or in a Spiral." MARTIN WILSON.

DARK SLIDE.—No. 19,121. "A Camera Slide for changing Plates in Daylight." THOMAS ROBERTSON.

PLATE CARRIER.—No. 19,124. "A combined Plate Carrier Releasing Device and Counting Indicator, for Magazine Cameras." HENRY PERCY TATTERSALL and GEORGE ARTHUR PICKARD.

RETOUCHING.—No. 19,181. "An Improved Method of Photographic Retouching, and an Appliance to be used therefor." ARTHUR GEORGE PALMER.

DETECTIVE CAMERA.—No. 19,313. "Improvements in Automatic Photographic Detective Apparatus for Passenger Cars." FREDERICK WALTER BROOKS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
14.....	Camera Club.....	*Tabloid Photographic Chemicals.* H. W. Lane.
14.....	Croydon Microscopical	Mr. Rudler's Second University Extension Lecture.
15.....	Croydon Microscopical	*The Avalon Village.* J. E. Clarke, B A., B.Sc., F.G.S.
15.....	Stonehouse	Open Night.
16.....	Borough Polytechnic.....	Lantern Night and Inauguration of Enlarging Apparatus.
16.....	Croydon Camera Club	Demonstration: *Glass Working for Amateur Photographers.* W. H. Smith.
16.....	Photographic Club	*By Land and Sky—the record of a Balloonist.* Rev. J. M. Bacon, M.A., F.R.S.
17.....	Camera Club.....	Smoking Concert.
17.....	Liverpool Amateur.....	Debate: *Direct* versus *Enlarged Negatives.* Opened by Dr. L. Morgan and J. Appleby.
17.....	London and Provincial	Open Night.
17.....	Richmond	Show of Novelties in Apparatus.
18.....	Borough Polytechnic.....	Instruction Evening: *Printing and Toning P.O.P.* F. W. Bannister.
18.....	Croydon Microscopical	Practical Demonstration: *Paget Self-toning Paper, Carbona, and V.P. Paper.* Mr. Baldock.

ROYAL PHOTOGRAPHIC SOCIETY.

THE inaugural meeting of the new session was held at the New Gallery on Tuesday, October 8, Mr. Thomas R. Dallmeyer, President, in the chair.

NEW MEMBERS.

Nominations of thirty candidates for membership were read by the Secretary, and seven candidates nominated at the June meeting were elected members of the Society.

AFFILIATION.

It was announced that the Council had admitted the following societies to affiliation:—Architectural Association Camera and Cycling Club; North Lindsey Camera Club; Chester Society of Natural Science; Hampstead Scientific Society; South Australian Photographic Society; Dunedin (New Zealand) Photographic Society; Wellington (New Zealand) Camera Club.

PRESENTS.

A number of donations to the Society's library and museum were announced, amongst them being a short life of Henry Perigal, ten volumes of the Royal Microscopical Society's Journal, "Elementary Telephotography," by Ernest Marriage, a collection of photographs taken during the South African War by J. E. Middlebrook, of Natal, a collection of old apparatus and examples, belonging to Mr. A. L. Henderson, and an album of photographs of Prize Oaks of England, from a series by Mr. J. A. Farrer.

PRESENTATION OF MEDALS.

The President addressed a few remarks to the meeting upon the Society's exhibition, which, in his opinion, and he hoped that of others, was quite as successful, if not more so, than the last. He contrasted the scope of the New Gallery exhibitions with that of the old Pall Mall regime, and then entered into a brief examination of the medal statistics. Of the five medals awarded in Section 1 (Pictorial Photography), one* at least had fallen to a professional, a fact that would doubtless be very gratifying to the profession. The President then announced the Judges' awards, as already given in the Catalogue and our pages, and presented the medals to the two successful exhibitors who were able to be present, viz., Mr. Archibald Cochrane and Mr. Douglas English.

PRESIDENTIAL ADDRESS.

The President then read his annual address, which was directed towards an exposition of the Society's prospects and certain suggested alterations in the rules and constitution, which he confidently expected would, if adopted, tend to the still greater success of the Society in the years that were before it. In the first place, reference was made to the fact that the Society, from a purely business point of view, and according to its articles of association, was in the same position as a limited liability company, except that no profits were made. As such he thought that there should be a paid secretary and librarian, as distinct from the honorary officers, from whom, he went on, the Society could not continue to expect to receive the large amount of attention that the Society's work demanded. The appointment of a foreign secretary was also advocated as a means of attaining a close touch with foreign contemporary workers. Two years hence the Society would celebrate its jubilee, and then the services of a foreign secretary would be invaluable. The President's next plea was for a wider representation on the council of the many other sciences and interests that directly and indirectly bear upon photography. He regretted to see that at the last Council election roughly only about 4 per cent. of the members nominated, and under 20 per cent. voted. He wished to urge upon the members the importance of a more lively interest in the Society's work and welfare, and trusted that there would be a considerable improvement in the immediate future. In the same connection he considered that the list of nominators' names, as at present printed on the ballot paper, was a thing that should be abolished, and the elector permitted unfettered to vote for those he knew to be qualified by their works. The address then touched upon the fellowship, and detailed the methods of election thereto from its inception in 1895 to date. The President was, personally, very much interested in the raising of the status of the Society's fellowship. The Council had, at that very time, further suggestions under consideration, and it should be known clearly to all that the Council had continuously devoted themselves to the consideration of measures for the improvement of its status. As regards the judges, he thought it was an anomalous thing that the Society should continue to sustain a rule that permitted non-members to attain a seat on its jury. He hoped that an alteration in this direction would also commend itself to the members. Finally, the President laid upon the table an appendix containing suggestions for the alterations of the articles of association, and he ventured to hope that a requisition for a special general meeting would be signed by not fewer than the twenty members necessary, in order that these might be well considered.

Sir H. Trueman Wood, a past President of the Society, formally proposed a vote of thanks to the President for his address, and offered it as his opinion that in the period of Mr. Dallmeyer's presidency he had fully maintained the dignity of the Society and fostered its wellbeing.

Mr. John Spiller, also a past President, seconded the motion in similar terms, and was supported by Mr. Chapman Jones.

The vote of thanks was carried by acclamation.

The requisition for a Special General Meeting will be available for signature at the Society's house, 66, Russell-square.

* Both Mr. William Gill, of Colchester, and Mr. James Auld, of Edinburgh, are professionals, and so we believe is Mr. Percy Lewis, making three professionals medalled.—ED.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 2,—Mr. R. Beckett in the chair.

Mr. Drage passed round a German illustrated paper, and pointed out how far superior the German press was to anything we can produce in this country, both in the quality of the paper and in the photographic illustrations.

Mr. A. L. Henderson then gave a most interesting lecture on Venice, accompanied by about two hundred excellent lantern slides: amongst these were several panoramic pictures, taken from the Campanile of St. Mark's, from a height of 400 and odd feet. The canals are so narrow, and the buildings so high, that when taking photographs from such a height the canals are invisible. Some very beautiful slides of the interior of St. Mark's were next shown, the sculptures and mosaic work being very wonderful.

Mr. Henderson remarked on the difficulty of photographing some parts of the ceiling in St. Mark's, owing to the profusion of gold, and the number of windows, and also the people, who, seeing the camera on its back, when the exposures were being made, would insist on walking up and looking down the lens.

Then came several pictures of the Doge's Palace, including some flashlight exposures of some of the terrible dungeons, where no daylight could penetrate, and when once the doors were closed, the unfortunate prisoners had no communication with their fellow creatures. Here also, in a dark passage, was the place of the secret executions and the trap door through which the body was thrown into the canal, remnants of the past, bearing palpable witness to the tyranny of the ancient rulers of this great and beautiful city. Pictures of the famous Bridge of Sighs followed, and of the canals, with the picturesque gondolas.

Mr. Henderson remarked how the photographer was greatly nonplussed on account of some, or nearly all of the towers and high places, which have a decided tendency to lean over to one side, and which made focussing very confusing.

A very hearty vote of thanks was unanimously passed to Mr. Henderson for his most entertaining evening, in reply to which Mr. Henderson said he was largely indebted to Professor Stebbing, who had furnished him with the descriptive history of "The Bride of the Seas."

Croydon Camera Club.—The above Club opened its twelfth winter session on Wednesday, 2nd inst., a large number of members being present. The President (Mr. Hector Maclean, F.R.P.S.) delivered an able address, entitled, "Photography of the Moment," and afterwards gave an instructive demonstration on the manipulation of photographic post-cards. In addition, Mr. W. H. Rogers gave a now fashionable "one-man exhibition," the prints being executed in carbon and gum bichromate. The display was in every sense attractive, and showed that Mr. Rogers combines a keen artistic sense with manipulative skill of a high order. Amongst the forty or so of framed prints were several which have already attained general recognition, such as "A Bit of Holland." But there were others which have not yet been seen in any

exhibition. Gum prints depend so much upon details of procedure that the results of most photographers can be at once picked out by the expert. Hence we find in Mr. Rogers' work a distinguishable difference in technical character to that which Mr. Moss's gum prints exhibit. Mr. Rogers shows by his sustained work that he is able to apply the special knowledge which he has acquired, with a good deal of taste and judgment. This one-man show has given so much satisfaction that it is proposed to continue the series. Mr. Rogers' display will be followed by a transparency exhibit by Mr. Ben. E. Edwards, and later on Mr. W. H. Smith will exhibit a selection of his artificial light portraiture. Mr. Maclean, in his opening address, covered a considerable amount of ground. He congratulated the Club on its past achievements, and then turned his attention to the London Photographic Exhibitions. He was much struck with the large amount of works shown which owed their existence to snapshots. A hand camera, in his opinion, if skilfully used, was better than its more cumbersome brother, the stand camera, as being best calculated to catch Nature in her more transient moods. With moving objects, such as figures, the hand camera was almost essential. Various types of snapshot cameras were alluded to, and their respective merits and demerits pointed out. Mr. Maclean dwelt strongly on the necessity for specialisation, even when using a hand camera. He regretted that topographical photographs, generally speaking, were unsatisfactory. Much useful work could be done in this direction, but it must be systematic. Colour photography next claimed attention. He did not believe that the camera would ever be able to fully record Nature's natural colours, or rather, the impression which their united blending gave to the eye. No hypothetical colour-photograph, he thought, could even approach a painting from the hand of a master, for a painter consciously exaggerated the colours of Nature in order to produce the intensified translation of what is presented to the eye, which the retina receives. Mr. Maclean concluded his address by referring to the all-popular animated photographs, and stated that cheap and satisfactory machines could now be obtained, such as the Pocket-Chromo. In the demonstration which followed, Mr. Maclean showed specimens of photographic post cards by different processes—the cards being coated with various sensitive emulsions to suit the taste of the user. Several forms of masks for protecting that part of the card not intended to be printed upon were shown, and examples of bromide, collodio-chloride, ferro-prussiate, V.B., and velox post cards were passed round, the last-named being demonstrated practically by the President. The usual discussion followed, in which Messrs. Mees, Smith, and others took part. A hearty vote of thanks to Mr. Maclean and Mr. Rogers terminated a pleasant evening. Amongst other interesting post cards shown was one on velox, from Mrs. Aubrey Le Blond, inscribed, "Greetings from Arctic Norway," picturing this untiring mountaineer on the summit of a Norwegian peak, until then unascended.

Blaydon and District Camera Club.—The annual meeting of this Club was held in the Co-operative Hall Library, Blaydon-on-Tyne, on Tuesday, October 1, Mr. R. Cubey, Vice-President, in the chair. The reports of the Treasurer and Secretary were read, which showed the Club to be in a sound financial position, having a good balance in hand, and a membership of 43. It is the intention of the Club to hold an exhibition at the end of this month. The following officers were re-elected:—President, Mr. Arthur Payne, F.C.S.; Vice-Presidents, Messrs. Hy. Dalton and R. Cubey; Committee, Messrs. Thos. Hughes, Thos. Howdon, J. T. Ramsay, and J. M. Gatheral; Treasurer, Mr. Chris. Robson; Secretary, Mr. Alex. B. Cunninghame. They have also in prospect a varied and interesting syllabus for the coming season.

Liverpool Amateur Photographic Association.—At the weekly meeting Mr. Fred Anyon gave a practical demonstration on "How to improve faulty negatives." Mr. Anyon made known several new formulæ for intensification and reduction. The subjects dealt with included intensification of negatives by mercuric iodide, reduction of contrast by bleaching in bichromate of potash, and redevelopment, also by ferricyanide of potash and hypo, and lastly, the retouching of negatives. The lecture was followed with great interest, and was illustrated by many negatives and prints showing the improvement possible by the means suggested.

FORTHCOMING EXHIBITIONS.

1901.

October 11–Nov. 2 ... Photographic Salon, Dudley Gallery, Egyptian Hall, London, W. Hon. Secretary, Reginald W. Craigie, Dudley Gallery.

„ 11 „ 2 ... Royal Photographic Society, New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.

„ 29 „ 2 ... Rotherham Photographic Society, Drill Hall, Rotherham. Hon. Secretary, H. C. Hemingway, Tooker-road, Rotherham.

November 6–8 ..... Hackney Photographic Society, Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.

„ 23–30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street Dennistoun.

Dec. 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

„ 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart, 93, Norfolk-street Glasgow.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notic is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BAD TRADE.

To the EDITORS.

GENTLEMEN,—For some time past we have heard complaints of bad trade, etc. I thought therefore the enclosed extract I have received from a brother photographer may be of some interest to your readers. I am, yours, &c., FRED. W. KING.

"I took nearly a hundred sitters yesterday (Saturday), and the Saturday before I had to have a policeman at the door to keep the people moving. We had to send the town people away, as country people came in such numbers. . . I did over a thousand cabinets last week. The whole of it myself, in addition to forty-eight enlargements, and taking all the sitters. . . .—Yours truly, ———."

THE ASSOCIATION OF ROYAL WARRANT HOLDERS.

To the EDITORS.

GENTLEMEN,—The address of the above (late Pall Mall) is 8, Hanover-square, W. The object of the Society is to protect the Royal Warrant Holders, to take proceedings against persons using the Royal Arms or imitations calculated to mislead. The book issued by them to Royal Warrant Holders gives a list of the same, but they have no power in any way in the granting of warrants. This is done by the Lord Chamberlain, and are only given to those who habitually work for or supply the King and Queen.—I am, yours, &c.,

HORATIO NELSON KING.

4, Avenue-road, Goldhawk-road, W.

To the EDITORS.

GENTLEMEN,—I beg to inform "Oxon" that the Hon. Secretary is Mr. W. Haynes Gibbs, 119, Pall Mall, S.W.—I am, yours, &c.,

Cults, Aberdeenshire, Sept. 30, 1901. W. G. JAMIESON.

PERMANENCY OF SELF-TONING PAPER.

To the EDITORS.

GENTLEMEN,—On page 638 of the JOURNAL, under the Meetings of Societies, reference was made to some excellent results obtained with my "V. B." self-toning paper. In reply to a query as to the permanency of the prints, "Mr. Haddon pointed out that the makers did not guarantee it to remain permanent over nine months."

This guarantee refers only to the sensitised paper before printing. I claim photographic permanency for the prints if washing and fixing are properly carried out. The paragraph referred to is likely to seriously prejudice the sale of my paper. Will you kindly put in the correction at your earliest convenience.—I am, yours, &c.,

ALBERT E. MALLANDAIN.

51, Cheapside, London, E.C., October 4, 1901.

THE BACKING OF PLATES.

To the EDITORS.

GENTLEMEN,—After reading over J. F. T.'s letter in THE BRITISH JOURNAL OF PHOTOGRAPHY of October 4, I must say that I do not agree at all with him. First, in your issue of March 30, 1900, I fail to find any allusion in regard to that peculiar very thin halo noticed only lately, I beg to insist, and not thirty years ago. There is something said in that number about stars, which means very long exposure of a bright or brilliant object against a dark background—I may say black—and also a letter about halo from windows or such, which always is full daylight against a dark border, such as a church interior or a brilliant object, and backing to prevent halation as usually known, but nothing as regards the special halo lately mentioned and noticed, namely, halo around dark object,

such as very dark grey against a lighter grey, such as granite, proven by the view I forwarded to you. Curious as this may seem, this peculiar halo does not encroach as with a window. That is the strong light on the weaker sides, or shade; but the strong shadows or dark outlines of an object push, so to say, the light away, and make the light edges look whiter or lighter than further off, in which case if reference could be invoked to star photographs, the stars should look brighter, being outlined by black.

The explanation tried by "J. F. T." as regards new lenses is, as he admits, is not much value. My lens is twenty-five years old. My views being architectural are never out of focus, nor do I look much for softness or too much contrast. In fact, I do not look for anything special except a good and true picture from the original building or interior. After all, "J. F. T." thinks probably that I am only speaking of the regular old halation, and not of the special one noticed only lately by others and myself.—I am, yours, &c., A. LEVY.

Asnières (Seine), October 4, 1901.

To the EDITORS.

GENTLEMEN,—I have much pleasure in giving M. Levy the information he desires as to avoiding the halo that annoys him. The effects he mentions are commonly due to one or more of the following causes. Firstly, the prevalence of a strong side or top light between the back portions of the picture and the nearer objects—remedy, choose a time when the light is well in front. Secondly, it may be caused by reflected light from a bright object or objects in the rear—remedy, to wait until the light is further back. These, and one or two similar cases, may be called optical or natural effects, and will probably be visible on the ground glass.

M. Levy wishes me to answer the following question: "If I so see on the focussing screen this peculiar halo, how can I avoid it on the plate?" The answer, of course, is that if it is so seen, it cannot be avoided, and this is precisely what I have been trying to demonstrate all along. The only remedy is to choose a suitable lighting that will not show such an effect on the screen. We cannot move buildings about, it is true, or employ backgrounds and reflectors as in a studio, but we can choose our time and point of view, and, as a rule, this is all that should be necessary.

In addition to the causes mentioned come what may be called results of halation pure and simple. Firstly, when the camera is much tilted, so that the light falls very obliquely on the plate; reflection from the back of the glass is in this case very frequent, and scarcely to be avoided even with backing—remedy, use films, or, better still, backed films. Secondly, it sometimes occurs with reflected light from an inclined surface—remedy as before.—I am, yours, &c., A. LOCKETT.

88, Brook-street, Kennington-road, S.E., October 8, 1901.

THE TRAILL TAYLOR MEMORIAL LECTURE.

To the EDITORS.

GENTLEMEN,—I shall be much obliged if you will permit me to inform the readers of the BRITISH JOURNAL OF PHOTOGRAPHY that, by desire of the Royal Photographic Society, admission to Professor Silvanus P. Thompson's lecture for the Traill Taylor Memorial will be by ticket.

The subject of the lecture is "Zonal Aberration and its Consequences," and it will be delivered at the New Gallery, 121, Regent-street, W., on Wednesday, the 23rd inst., at eight p.m.

I shall be happy to forward tickets for free admission upon receipt of stamped, directed envelope.—I am, yours, &c., P. EVERITT,

88, Evering-road, N., October 7, 1901. Hon. Secretary.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—Re present-day grievances of the professional photographer who wants dealers' terms, though he is not a dealer, but who, in his ordinary way of business uses more plates, paper, etc., than seventy-five of the so-called dealers, I would suggest a remedy. I would advise him to join at once the P.P.A., and throw his superfluous energy into the movement, do all that lies in his power to add to its membership, and make us numerically strong and a power in the land.

"How this transformation scene?" you will ask. I answer simply by co-operation. All industries are calling for combination, and are welding their interests into one common cause—protection—to fight the enemy of present-day trade—unfair competition. We have only to look at the gigantic strides of those businesses that have joined hands and are now working as one for a strong argument in favour of such combination.

Now, sir, I say, Why should the professional photographer be blind to his own interests? Let smoke and soap bubbles die a natural death; they will lie side by side with the poor unfortunate chemist who has thrown the dignity of his profession to the winds and does 12×10 enlargements for a couple of shillings. These forms of competition are like the green bay tree—"In the morn it flourishes and grows, but in the evening it is cut down and withereth." Let every professional photographer in the United Kingdom join hands as a whole for the common welfare of our profession. The annual subscription (five shillings) is within the reach of the poorest man that ever told his sitter to "look at the monkey." Then when we feel that we have left our swaddling clothes behind us, and have blossomed into a strong and robust manhood, we can enter into the arena. The idea is workable. Say, we have a membership of one thousand. What stands in the way of forming a company, whose capital would be found by its members, and whose directors and working staff would be men of practical experience drawn from our own ranks? I can see a great future before our Association, not as a Society to meet and discuss petty grievances, but as a powerful organization.—I am, yours, &c.,

LOOKING FORWARD.

LIQUID FILTERS FOR DARK ROOM LANTERNS.

To the EDITORS.

GENTLEMEN,—In THE BRITISH JOURNAL OF PHOTOGRAPHY for August 9 you published a short article by me with the above title, and in the number for September 13 a letter by "Rex" appeared in your correspondence columns upon the same subject. I shall be glad to accept your kind invitation to answer the latter.

The difficulty "Rex" met with in preparing a solution of mandarin is due to an exceedingly fine insoluble impurity. Of the dye-stuff itself about twelve parts will dissolve in 500 at ordinary temperature, and the solubility can be doubled by the heat of the hand. It is best to prepare a concentrated solution, filter repeatedly, dilute to two parts in 500, and filter again, if necessary, after the solution has been standing for several days. The clear solution prepared in this way gives a very satisfactory illumination, greater than cherry fabric or ruby glass, although somewhat less than bichromate of potash. The mandarin used by "Rex" bears the same name as, and is probably identical with the Berlin Company's product. There seems to be no definite price for it. From three different sources I paid 8d. for ten grammes, 6d. for 25 grammes, and (after my first communication) about 2s. 6d. for 30 grammes.

I have repeated the tests described in my previous article, and have sent you the results, which do not confirm the absence of fog noted by "Rex" with the bichromate solution. Three plates were exposed to each of three solutions: a 10 per cent. potassium bichromate, a 35 per cent. ammonium bichromate and 2:500 Mandarin G extra. The plates were exposed in strips for a total of 4, 2, ½, and 0 minutes, at a distance of 16 inches from the one candle-power petroleum lamp, and 13½ inches from the front of the glass trough. All nine plates were developed for exactly five minutes in a freshly diluted rodinal solution 1:25. The plates were a Barnet medium, an isolar, and an isolar orthochromatic, the two last being rapid German plates. The bichromate solutions have not prevented a decided fog, which is noticeable on the Barnet plate, even in the half-minute exposure. The ordinary isolar shows less fog, not because it is less sensitive, but because the plate develops more slowly on account of its peculiar construction. The orthochromatic plate is densely covered, as was to be expected. The mandarin orange has been much more effective, not only with the orthochromatic plate, but also with the other two.

The lantern showed no trace of white light, direct or reflected, and had no reflector or condenser. The other conditions were similar, if anything, less severe, so it is possible that the combination of plate and developer used by "Rex" was less sensitive, or else the bichromatic light contains rays that fog some non-orthochromatic plates more than others.

You will also notice that the more concentrated solution of ammonium bichromate has not had a marked effect in preventing fog. Possibly the colour of the solution is due to a dissociation product the proportion of which decreases with increasing concentration.

These tests, although they confirm those given in my first article, do not prove conclusively that the mandarin solution is a better light filter for ordinary plates than the bichromate solution. The definition of the best light filter is somewhat complex. Primarily, the best light filter is that which lets through the greatest amount of optically effective light, together with the least of chemically active. But not only the ratio of one to the other must be considered, but also the actual amount of each, a fact which would, for instance, throw out some filters, such as lithium carbonate and others that give a pure light limited to a small part of the spectrum. Three colours may be used—red, yellow, and green: of these the yellow is the brightest, the green is most agreeable to the eye, and the red is least so, but least active chemically. For some purposes the pathological effect of the colour must be considered, also the dependence of its chemical activity upon

the nature of the sensitive film. Finally there remain the question of the stability of the solution, and the difficulty of comparing the general illuminating effect of different colours.

We have not enough data from the above tests to apply these general principles to the mandarin and bichromate filters, and decide which is the better. The mandarin has caused less fog, but it gives less light. The mandarin gives a red light which contains yellow; the bichromate gives a yellow light that contains green, and, probably, smaller quantities of light of lesser wave-length and greater chemical activity. This is the cause of the fault of the bichromate filter that it gives rather too much light, for, although the fogging effect is small in comparison to the remarkably great illumination, it is not negligible absolutely. The chemically active rays for orthochromatic plates include yellow and green, and therefore for these the mandarin filter is the better. The latter has also the advantage that the nature of its light can be varied by changing the concentration. The bichromate light is admirably suited to a weak uniform illumination of the dark room, and with the usual precautions it is quite possible to develop with safety. Nevertheless I am of the opinion that for a lamp upon the developing table the mandarin is the better, because it gives a wholly sufficient light, both direct and reflected, and one is rather more free from the necessity of being cautious and of discriminating between ordinary and orthochromatic plates. Possibly the addition of eosine to the bichromate solution may be an improvement. I have not been able to try it, as I am located far from my source of supplies, and received the wrong sort from my dealer.—I am, yours, &c.,

W. S. DAVENPORT.

Clausthal, Harz, October 1, 1901.

[The test plates kindly sent by Mr. Davenport may be seen at our office by "Rex" if that gentleman will favour us with a call.—EDS. *B. J. P.*]

THE PHOTOGRAPHIC CLUB.

To the EDITORS.

GENTLEMEN,—The members of the Photographic Club will be pleased to welcome any member or professional photographer who may be in London for the Exhibitions. The meetings of the Club are held at Anderton's Hotel, Fleet-street, every Wednesday ,at eight o'clock. The subjects for the remainder of the month are:—

October 16.—Rev. John M. Bacon, M.A., F.R.S., "By Land and Sky, the record of a balloonist."

October 23.—Mr. Charles Wallis, "Photographing Polished Metallic Surfaces."

October 30.—Mr. F. A. Bridge, "The Convention at Oxford," with slides.

—I am, yours, &c.,

E. A. NEWELL, Hon. Sec.

4, Maiden-lane, London, E.C., October 4, 1901.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITORS.

GENTLEMEN,—I am a member of the Royal Photographic Society, and I now learn from the pages of your JOURNAL that I am an exhibitor; but up to the present time I have not had any intimation as to the acceptance of my exhibits, nor have I had any catalogue.

May I inquire if this is the manner in which all provincial members are treated? If so, I do not think it tends to increase the membership of the R.P.S. No catalogue, and the Exhibition now open a week.—I am, yours, &c.,

HARRY WADE.

25, Blackfriars-street, Manchester, October 5, 1901.

DR. GRUN'S LENS.

To the EDITORS.

GENTLEMEN,—I enclose you a few recent photographs taken by myself at various places of amusement. You will see that I have advanced considerably since the spring, and have succeeded in getting results beyond what I ever anticipated would be possible. To take a photograph with one second exposure at a theatre is now a simple matter, and I am now getting results at $\frac{1}{25}$, $\frac{1}{50}$, and $\frac{1}{75}$ of a second. The enclosed photographs demonstrate this fact. There were none taken at more than $\frac{1}{25}$. The cartwheel one was taken at a very rapid pace, but I cannot say exactly what.—I am, yours, &c.,

EDWARD GRUN.

The Hall, Southwick, Brighton, October 2, 1901.

[We are obliged to Dr. Grun for the specimen prints sent. If any of our readers are sufficiently interested to call and see the results we shall be pleased to show them.—EDS. *B.J.P.*]

CARBONA PAPER.—A CORRECTION.

To the EDITORS.

GENTLEMEN,—I notice in my last letter which you did me the honour to publish in last week's BRITISH JOURNAL OF PHOTOGRAPHY that in No. 2 of the stock solutions in the formula given it is printed 1 oz. av. of borax; this should be ½ oz. av., and the mistake, I fear, was made by me in copying my notes into my letter.

Of course, the context of my letter explains that a five per cent. solution is intended, and any one trying to make the solution as given would only get about a five per cent. strength as the result. I am sorry that I should have made the mistake, however, as such an error, once getting into print, is difficult to recall, and largely discounts the good (if there is any) in the formula given.—I am, yours, &c.,

P.O.P.

THE PROFESSIONAL PHOTOGRAPHERS AND THE PLATE-MAKERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—May I be allowed to "sharpen" the lance of your correspondent who signs himself "Fettered Lance"? There are at least a score of British plate and paper-makers, and I question whether half that number are members of the Plate-makers' Association. Therefore your correspondent should not allow himself to be fettered, but look around, and he will get all that he desires. I am perfectly satisfied that I buy equally as well as the dealer, and so may "Fettered Lance" if only he will do as I do, viz.:—

1. I deal only with firms of good repute.
2. I buy everything whenever possible from the manufacturer.
3. I stipulate for "best" quality.
4. I obtain full particulars as to (a) prices, (b) discounts, (c) terms.
5. I pay my bills when due, and so secure all discounts.
6. I make it a rule to see all travellers when possible. I lose nothing by so doing, but stand to gain. In fact, I prefer to deal with a traveller, rather than correspond with his firm. We talk "business."
7. I study the JOURNAL, and I read all circulars received by post. Some go into the waste-paper basket, and some I put aside for future consideration.—I am, yours, &c.,

UNFETTERED LANCE.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

H. B. Collis, Westgate Studio, Canterbury. *Three photographs of S. Cooper, R.A., C.V.O.*

A. Jennings, The Studio, Cavendish-street, Keighley. *Two photographs of Lieut. A. Hellawell.*

David Hedges & Sons, 7, Dicconson-terrace, Clifton-square, Lytham. *Two photographs of homing pigeon.*

ADDRESS WANTED.—BURLINGTON SMITH: Messrs. Gwynne's full address is Brook-street Works, Holborn, E.C.

THE WIZARD CAMERAS.—"SUBSCRIBER" writes: "Can you please give me the address of the makers or importers of the Wizard cameras?"—In reply: Messrs. Seabrook Bros. and Co., 21, Edmund-place, Aldersgate--street, E.C.

H. H. (Burton-on-Trent).—On page 581 of the ALMANAC there is a table which shows the English equivalents of all the weights on your list. If you take the litre as being thirty-five and a quarter ounces it will be near enough for all photographic purposes.

ADDRESS WANTED.—E. LINGFORD writes: "In your issue of September 13, you notice 'The Stereoscopic Photograph.' Will you kindly let me know where this publication can be obtained? My newsagent is unable to get it."—In reply: Address Messrs. Underwood and Underwood, Red Lion-square, W.C.

C. C. MATT.—"OLD CROW" writes: "Wanted the names of any German manufacturers of the above, where one can obtain supplies of the above fresh?"—In reply: Much of the collodio-chloride paper sold in this country is made in Germany, but the vendors of it do not publish the names of the makers of that they supply. If you wish to deal direct with the makers, if they will supply you, we should advise you to get one or other of the German Photographic Journals, and consult the advertisement columns. We do not know any German manufacturers who would supply paper here except through their English agents.

NIGHT WORK.—The apparatus you mention is patented, and you will not be able to use a colourable imitation of it of your own construction without the patentee's sanction. You will see by the advertisement columns that both Morgan and Adamson supply electric lighting plants for studio purposes, and both systems are good.

THE DALLASTINT PROCESS.—A. G. F. asks: "Can you tell me if Mr. Dallas is still alive and working his Dallastint process? I believe his address was Southampton-row, but I have lost sight of it."—In reply: Mr. Dallas is still alive, and, we believe, is still working his process. His present address is, we think, Furnival-street, Holborn, but we are not quite sure.

THE USE OF DRY PLATES.—E. P. writes: "I am informed by a dealer that the dry plate was first proposed for and used by amateurs, and afterwards by professionals. Is this correct?"—In reply: Gelatino-bromide dry plates were the invention of an amateur, Dr. Maddox. Until the manufacture of them was taken up commercially, they were not much used by professionals.

PHOTOGRAPHS OF JAPAN.—Mr. E. D. BERNHARDT, of 29, Hervey-road, Blackheath, writes: "I am wanting some photographs showing the progress Japan has made in the last quarter of the last century, perhaps showing railways, trams, theatres, etc. I should feel very much obliged to you if you would be good enough to let me know where I could get such photographs here in England."—In reply: Perhaps some reader will supply our correspondent with the desired information.

GLAZING P.O.P.—"HYPO" asks: "(1) How are metal plates enamelled for glazing P.O.P.? (2) What is the enamel made of? (3) If P.O.P. prints, put in hypo for ten minutes after toning in combined bath without alum or lead, are as permanent as prints toned and fixed in separate baths?"—In reply: (1 and 2) We believe they are coated with a special Japan made for the purpose, and afterwards "stoved," that is, exposed to prolonged heat in a Japanner's oven. (3) Yes, if the prints are really toned with gold in the first instance.

STAINS ON PLATES AND FILMS.—"CRANION" asks: "Can you tell me how to remove silver stains on plates or films, caused by damp P.O.P.?"—In reply: All stains of this kind are difficult of removal, and some cannot be successfully removed at all. Treating the plate with a dilute solution of cyanide of potassium will sometimes get them off. Another way is to rub the surface of the negative over with an alcoholic solution of iodine, until the stains are whitened, and then immerse it in a solution of hypo-sulphite of soda, to remove the iodide of silver formed.

STAINED PRINTS.—J. G. BAYFIELD writes: "I am an assistant photographer, and tone large quantities of prints at a time, sizes varying from 12×10 s to midgets, and find I somehow get irregular yellow stains on the white of the midgets. I tone the midgets last, and let them stay washing in the dish. Is it caused by the free silver settling on the surface of them?"—In reply: Without seeing the stained prints we cannot say. But we rather suspect that the stains are due to the prints being allowed to stick together while they are in the fixing bath.

FOREIGN PHOTOGRAPHIC JOURNALS.—W. asks for the names of prices and address of publisher of the journals which, in France and Germany, respectively, take the place of THE BRITISH JOURNAL OF PHOTOGRAPHY?—In reply: The principal French Photographic Journals are the "Bulletin de la Société Francaise de Photographie," published by Gauthier Villars, Quai des Grandes-Augustins, 55, Paris. "Moniteur de la Photographie," by the same publishers. "Bulletin du Photo-Club de Paris," 40, Rue des Mathurins, and the "Photo. Gazette," 3, Rue Racine, Paris.

A. C.—The makers of the eliminators named claim that they are free from the drawbacks of others. We prefer a plain fresh solution of hypo, because, theoretically, it is better, and more likely to yield more permanent results than acid hypo. We use any of the commercial plates and papers. Some prefer one acid and some other, but the action of all is much the same. With care clear lights are obtained with simple hypo, but, sometimes, with less care, they are more easily secured with an acid bath. The reactions of acid baths have frequently been dealt with in back volumes.

PHOTOGRAPHS FOR CRITICISM.—"RUSTICUS" writes: "(1) Please criticise the enclosed prints as to lighting: is there anything I can do to improve them? (2) How do they class with the usual work of middle class photographers? I may say my prices for those on green cards are 10s. 6d. doz., and enamelled (stripped), as the brown, 12s. 6d. doz. (3) The two on green mounts are taken at opposite ends of the studio to the others: is there any choice between the two ends? (4) Some time ago I had a cabinet sent to copy to carte, and it had 'copyright' on it. I made inquiries and found that nothing was said at the time, or since, about copyright, by the photographer, and they were paid for by the sitter. Should I lay myself open to penalties or damages if I copy it?"—In reply: (1) The lighting is good, but it would be better if the highest lights had a little more "sparkle." (2) Very well. They are about the average of middle class work. The posing of the figures, however, might be improved—it is a little too rigid. (3) None whatever, so far as we can see from the prints. (4) If the portrait was paid for in the usual course of business, and no special agreement made as to copyright, there can be no copyright in the picture.

ELECTRIC LIGHT FOR PORTRAITURE.—A. G. writes: "I should be pleased to have your advice on electric light for portraiture. Arc lamps. What candle power should I require? Say, exposure, 3 secs., f-5, 18 plates, Wynne's meter. I should be pleased for any suggestions as to kind of lamps glass, and who can supply."—In reply: From 5,000 to 10,000 candle power will be a suitable light for the studio. Of course, the nearer the light is to the sitter, the shorter the exposure required. But it is very inadvisable to have the light too near the sitter. Both Adamson's and Morgan's systems are good. Their advertisements will be found in the JOURNAL. Better write to them for prospectuses.

MAKING BACKGROUND.—GEO. WIER says: "Will you please tell me the easiest way to make a background in distemper colour suitable for portraits in a small studio?"—In reply: First get a wooden frame of suitable size. On this strain some unbleached sheeting, which may be had at any draper's of different widths. Then give it a coat of "double" size, to be had at the oilshops, and let it dry. Next mix together whiting, drop black, and a little venetian red, to give a warm tone, with water to the consistence of thick cream. To this mixture add sufficient size to form a tremulous jelly when cold. Apply this cold with a large whitewash brush as evenly as possible.

THE BRITISH ASSOCIATION.—G. W. S. writes: "I shall be greatly obliged if you will inform me of the name of the scientific periodical in which I should find the fullest account of the proceedings of the British Association, lately met in Glasgow; also the date of the meeting. If not asking too great a favour, I should be much indebted to you if you would answer my queries on enclosed postcard, as it is important I get this information with least possible delay. Of course I am well aware it is not your custom to do so, and for that reason would not ask you without it was urgent."—In reply: The best reports were published in "The Times" and "Nature." The meeting was held in September. We cannot undertake to answer through the post.

BOOK-KEEPING FOR PHOTOGRAPHERS.—"CLUB" says: "I do a large business in a general way, collecting the payments from my clients by instalments, made through collectors whom I employ, much in the same way as the business of A. and G. Taylor. Could you tell me where I could purchase a set or series of books suitable for the class of business I do, and thus save the expense of having to get them specially printed? Further (2), could you give me the name of a good book on 'book-keeping' for photographers?"—In reply: A set of account books, etc., for photographers, was published some years ago, but we think their publication has since been discontinued. So far as we know there is no work published, specially devoted to book-keeping for photographers. Any book on "book-keeping" will give you a general insight into the subject.

DEVELOPMENT, ETC.—P. C. S. writes: "(1) Are negatives made by the 'stand method' of development as good as those by the ordinary method? (2) If a plate is underexposed will it develop into a good negative by this method? (3) Is there a book on this subject? (4) After development, will one rinse in cold water suffice for a plate before being put into the alum bath; or, if no alum used, into the fixing? (5) Can any other kind of lens be used in a Cycle Wizard C, besides the rectilinear which is supplied with the camera?"—In reply: (1) Yes. (2) All will depend upon the degree of under exposure. If that is great, no method of development will yield a good negative. There is no advantage in the so-called "stand" method, beyond a saving of trouble, when the development is prolonged. (3) No special book. (4) A tolerably good rinse will suffice. (5) Yes, certainly, if it be properly adjusted to focus.

CAMERA FOR STICKYBACKS.—"CHAMPION" writes: "Will you be so kind as to reply to the following inquiries:—The name of the firm that sell the camera used for what are termed 'Stickybacks,' which have been the rage in Douglas, I.O.M., whether films are used, or plates, and if any extra plant, machinery, etc., is used for printing, washing, and finishing? I should also esteem it a favour if you could tell me approximate cost of outfits necessary."—In reply: By "Stickybacks" we imagine you refer to stamp portraits, which are usually gummed at the back. If so, cameras for taking them are supplied by most of the principal dealers, such as Fallowfields, Houghtons, and others. Messrs. Seaman and Son, Chesterfield, also supply frames for printing the portraits from single negatives. The price of the camera varies with the number of lenses with which it is fitted. Better write to the different makers for their price lists.

FERROTYPES.—"CRIPPLE" writes: "Having this year tried the ferrotype work on the sands, being a cripple cannot get about so quick as others, I thought if I was to make something like the enclosed, take some views of the place, and mount them in optical contact, so as to sell, with their own photo at back. I have not seen such a thing before. Shall be glad of your opinion through your correspondence columns. (1) What you think of the idea, and if it is worth registering; if so, what should I have to do? (2) Where could I get some thin cardboard to make them? (3) Where could I get them made in different sizes?"—In reply: (1) The idea is novel. But we think it would require a patent to protect it, and we rather doubt if the thing would be commercially worth that. (2 and 3) Some of the fancy box makers, or the photographic mount makers, would probably supply the mounts to your design. The cardboard itself may be had at most stationers.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Photographing Live Fish. A few interesting notes upon this subject are given by Dr. E. Bade, of Berlin, in the "Amateur Photograph." Fish are very rapid in their movements, and even when they appear to be still, closer examination will show that their fins are in constant motion. A very quick-acting shutter is therefore a necessity, but the absorption of light by the water, and the glass sides of the aquarium, impose a limit. The lens should be a rapid one, and used at full aperture. It might be supposed that a small aquarium would be best for the purpose, but Dr. Bade has found that a large aquarium is much better. Particular attention should be given to the quality of the glass forming the sides. We well remember the difficulties experienced by a noted photographer, who attempted some years ago to make some aquarium photographs. Probably his failure was due to the glass of the aquarium not being homogeneous. The exposure should be made in direct sunlight, if possible, and the lens focussed for a particular spot. The photographer must then patiently wait until the fish obliges him by taking up the correct position. We need scarcely add that small negatives for subsequent enlargement, will save the photographer a large percentage of failures. An excellent photograph of a perch is given with Dr. E. Bade's paper.

Photographing Growing Crystals. For many years the microscopical study of the gradual growth of crystals has had a great fascination for experimenters. Perhaps the most gorgeous sight known to science is the effect to be seen by the aid of the polariscope, of the gradual production of crystals from a solution of one or other of a great variety of common and easily obtained salts, the Peruvian bark alkaloids, quinine, etc., in particular. But besides the mere pleasure to the eye the growth of crystals under the microscope has become a serious study. Vogelsang suggested retarding the growth by the addition of various substances to the solution, and his method has led to many important investigations. But two American investigators, Messrs. T. W. Richards and E. H. Archibald, have taken the subject up, being aided by a grant from the Rumford fund, and in order to obtain clear and trustworthy evidence of the actions that take place, have used a process of instantaneous photography to record the changes that take place. Their results are recorded in the "Proceedings" of the American Academy of Arts and Sciences, and they give in their first paper some illustrations of the photographs they have obtained. The method seems likely to lead to very valuable results, and is full of promise.

* * *

Ferricyanide Solution. This base of the well-known Howard-Farmer reducing solution is very interesting as regards its behaviour to light. It is a common recommendation with many photographic chemicals to keep their solutions away from the light, and this particular chemical, potassium ferricyanide, should be especially guarded in this direction, for, from a paper by J. Matuschek in the "Chemiker Zeitung" it is shown that under exposure to bright sunlight the whole of the salt is decomposed; that is to say, all the iron is thrown down in bright sunlight—the brighter the sunlight the quicker the decomposition. We may add that in practice we find a twenty per cent. solution a very convenient strength for storing. There are occasions when for special purposes a strong hypo-solution is wished to be used. If then, as is commonly done, the chemical is stored in ten per cent. solution, the use of the required amount causes undue dilution of the hypo. We may note one very useful employment of this solution—the simple ferricyanide, without hypo—that is not known as much as it might be. We refer to the removal of slight amounts of iridescent stains through over-keeping of a plate, or to other forms of surface reduction, and some cases of green fog. It suffices simply to pour on and off the plate for a few times a very dilute solution—about a drachm of the twenty per cent., to half a pint of water; this is equivalent to about a grain to the ounce. The effect of so small a quantity is very irregular. A negative almost unprintable in its original form will be quickly rendered clear and crisp and free from all colouration in the shadows.

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Flashlight Powders. Mr. Romyn Hitchcock, in the "Photographic Times," recently had a valuable disquisition on the requirements for flash-light powders, and the way in which various preparations meet them. Practical men and others are aware of the great variations of power in the large number of such preparations sold to photographers, and they know, too, that in practice there is a great difference in the amount and the characteristics of the fumes produced. Thus, we divide the magnesium light preparations into two classes, firstly, the quick combustion by mechanical means of the powdered metal; secondly, the incorporation with other substances to make a pyrotechnic mixture. The first class leads to the production of a heavy white smoke, which quickly falls, and smothers everything around with white dust. The second gives a more violent combustion—explosive it may be—but the fumes first take an upward course and hang about the ceiling for some time, the ultimate result being, of course, a white falling dust; but it is some time before it falls, and is less in quantity. Indeed, a smart operator could get out of the way before his victims became cognisant of the falling powder. Mr. Hitchcock gave a thorough account of various preparations used and suggested, and concluded by giving one, of which he says, it is the quickest and most active mixture, and burns with the least production of fume:—First, prepare an intimate mixture of aluminium powder, 1; magnesium powder, 1; then take of this mixture 10 parts, potassic chlorate, 5 parts, potassic permanganate, 1 part.

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Autumn and Autumnal Pictures. Chill October is with us, and the foliage is now beginning to put on its glorious autumnal tints. Beautiful as spring is, in the eyes of many artists autumn is still more beautiful, by reason of the great variety of tints that is assumed by the foliage, and their brilliancy when the sun is shining upon them. Therefore, now is the time for photographers to secure them, ere the opportunity be lost for another twelve months. Photography, it is true, fails to reproduce autumnal effects, as a painter with colour will do; still much may be done in that direction by knights of the camera. A great majority of the late Mr. Vernon Heath's best pictures were taken in the autumn. The fine collection of carbon enlargements, from his negatives of Burnham Beeches, to be seen in the Guildhall, and which we believe were largely instrumental in the City Corporation acquiring the "Beeches" for the public, were all, if we are not mistaken, taken in the autumn, and by the wet collodion process, yet they still want a "lot of beating." Some of Mr Heath's later pictures were taken on gelatine plates, but we are not aware that they surpassed those which he obtained by the older process; but then, commercial orthochromatic plates were not much in vogue. The present day photographers possess far greater facilities for rendering the varied and glorious tints of autumn than had those of the past. They now have commercial orthochromatic plates and colour screens that, when rightly used, will render, approximately at least, a true colour value to the different tints of the foliage in the negative. To those desirous of securing autumnal pictures we would say, secure them at once, using orthochromatic plates and a colour screen adapted to these and the lights at the time, and give them a full exposure. The plates should also be backed to avoid halation when there is much sky showing between the trees or above them.

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Photographs of Still Life. Photographers, or, at least, many who are not mere copyists, are always on the look out for novelties to portray. Two or three years ago there

was quite a craze for "mud flats," "waning days," "misty mornings," "et hoc genus omne," and that craze has not yet altogether subsided, as witness the pictures in the two exhibitions now open in London. It was always so, in late years at least, in photography. If one artist adopts, and is successful with, a certain class of work, he has at once a host of imitators of his style and subject, simply because they have little or no inventive faculty to find original subjects or styles for themselves. A few years ago flower studies were always a feature in the annual exhibition, now they are rarely seen, except as examples of what can be done in the way of natural colour photography. Groups of game, fish, fruit, etc., have always been a favourite theme with many painters, but it is one seldom essayed by photographers, though the subjects are well within the scope of photography. Most of us are familiar with the fine pictures of groups of fruit by Lance, and groups of game and fish by other well-known painters. But we do not remember having seen in photographic exhibitions pictures of such subjects. Many years ago some very fine photographs of fruit were produced, of large size direct (about 20 by 16) by the late Mr. Roger Fenton, we think, the fruit being grouped by Lance himself, which excited great admiration at the time. But since then, so far as we are aware, nothing comparable with them has been produced, or attempted. Why they have not been it is a little difficult to conceive, seeing how well they lend themselves to photography, and the excellent pictures they may be made to yield, when artistically grouped and lighted. The reason why this topic is alluded to now is that the shooting and deer-stalking season is now on, so is the fruit season, and there is no difficulty in procuring the subjects. Pheasants and partridges, with the plumage perfect, are very beautiful objects, so are hares and rabbits. Grapes, pineapples, peaches, pears, apples, and such like fruit, nicely grouped, make very fine pictures. Groups of fish, too, such as salmon, trout, pike, roach, bream, etc., with the scales perfect, judiciously arranged, make admirable pictures, as many painters have shown us. If a photographer were to make a feature of this class of work and were successful, and showed it at the exhibitions, he would soon have a host of imitators, we imagine.

* * *

Processes at the Royal. It is always interesting to note the processes by which the pictures shown at the Royal Photographic Society's annual exhibitions are produced, as it, to an extent, illustrates the ideas and tastes of the exhibitors, and perhaps also those of the committee of election. We find this year, in the Pictorial Section, that out of the 321 exhibits in which the processes by which they were made are mentioned in the catalogue, considerably more than two-thirds of them are either by the platinotype or the carbon processes—the former process preponderating. The actual figures being platinum 131, carbon 78. Of the remaining 92 we notice that more than half of those are bromides. The rest are made up of "silver," silver platinum toned, gelatino-chloride, gum bichromate, etc. It is curious to note that there is only one picture by the collodio-chloride process, and that is sent from abroad, yet the process itself is an English invention, and is in considerable use here, but with paper that is mostly prepared on the continent. Another curious fact is, that there are only a couple of exhibits by the gelatino-chloride process, and yet that process is, probably, in more general use amongst amateurs and professionals than all the other printing processes put together. From this it will be seen that the exhibitions of the "Royal" must in no way be taken as representing the processes most generally practised, alike by professional and amateur photographers of the period, for they do nothing of the kind, as the above figures prove. Possibly some future historian may quote from the exhibition catalogues of the last two or three years to illustrate that the only processes in general vogue at this period were the platinotype and the carbon ones, and that, too, with some show of reason.

IDENTIFICATION BY PHOTOGRAPHY.

At a very early period in the history of photography, the product of the camera was recognised as a valuable aid to the police in the identification of those who had come within the strong grasp of the law. And thus it became customary, both in this country and other civilised states, for a man, immediately after conviction, to be photographed, so that his portrait might be added to the interesting collection which forms part of the archives of the police. Such a portrait has again and again been instrumental in furnishing the link which was wanting to convict a suspected individual, and the value of the system, especially if used in conjunction with measurements and finger prints, is undeniable. We had an opportunity, not long ago, of examining a large number of these photographs of criminals, and this examination gave rise to reflections which may prove to be of some interest to our readers. It is a common belief that the hardened criminal carries in his face more or less distinct signs of his character, just as the victim of phthisis and other terrible diseases may show indications of the malady which is consuming him. We have most of us been educated into this belief by the genius of the novel writer, who has unwittingly led us to accept certain types as being indicative of particular forms of crime. To take one instance only, Bill Sikes, as described by Charles Dickens, and as pictured by the facile pencils of Cruikshank, Barnard, and others, is as firmly established the symbol of the British burglar, as is the rotund figure of John Bull as the personification of British nationality. Bill Sikes, however, is so far as this collection of notorious characters is concerned, conspicuous by his absence. Burglars and murderers there are here in plenty, and in more than one case the two crimes are represented by a single individual, but he is not in the least like the murderer of poor Nancy. Indeed, the more closely we examined these portraits representing the seamy side of human life, the more impressed were we with the conviction that there is very little in a man's outward appearance to indicate his character, as known to his Maker, and to the police. This at once explains how many of these men have led, up to the time of their conviction, double lives, some of them earning the character of being exemplary husbands and fathers, while at the same time they provided for those dear to them by means which eventually brought them into touch with a judge and jury.

That this state of things is not impossible becomes evident when these photographs are even casually looked over. If we had not been informed beforehand of the real origin of this gallery of portraits, we might have supposed that they

represented men selected haphazard from any crowded thoroughfare. There is something about them that forbids the thought that they have been produced for the family album, by the professional photographer, in the ordinary course of his business, for there is no attempt at posing, and if the models have been enjoined to "look pleasant" they certainly have not succeeded in doing so. Moreover, there is no attention to correct lighting, or any of the other little refinements which the photographer adopts in order to get an artistic result. The pictures are, too, all of the same size, comprising the head and shoulders only, and in every case the full face is presented towards the camera. The faces are of all types, and, as already indicated, there is no peculiarity about them generally. As we look at them the thought occurs to us that the collection would be invaluable to an actor, who could gather from it hints as to "make up," which would enable him to personate men in every class of life, the just as well as the unjust.

It would of course be absurd to regard these productions as specimens of photographic portraiture, for it is evident that they are merely memoranda recorded by the camera, and very often under adverse conditions. In some of them it is quite evident that the model has purposely set himself to defeat the end in view by distorting his face. One opens his eyes to a fixed stare, while another closes them. Still another puts on an unwonted grin, draws down the corners of his mouth, or adopts any dodge which he thinks will render his face something different to what it is in repose. It is obvious that it is quite impossible to stop any one who chooses to give a variety performance with his features in this way. The only wonder is that the authorities have not long ago adopted a method of photographing criminals by stealth. It could so easily be done, and portraits so obtained would have a real value in recording a man's ordinary pose as well as his features.

How strange, and yet how true it is, that with these features, comprising only the two eyes, the nose, and the mouth, planted in the same relative positions on a convex surface called "the face," Nature should be able to produce such infinite variety, that we are able to recognise not only our particular relations and friends, but mere casual acquaintances whom we meet only at rare intervals of time. Is it a matter for wonder that Nature sometimes repeats herself, and that one face is so like another that the belief has arisen that every one has his double?

Probably there are few among us who have not at one time or another experienced an instance of mistaken identity. It may be that you meet a man casually in the street, shake hands with him, and after one or two commonplace remarks, he says, "I fancy that you have made a mistake," or, "You have the advantage of me," to which you reply, "Are you not Mr. Smith?" "No," he replies, "my name is Brown." Or, possibly, you are the one to be addressed in error. In either case the position is awkward, and an apology for the mistake puts an end to an embarrassing situation. If such a mistake be possible in the recognition of a living being, the muscles of whose face vary its expression every moment, how much more easily is one likely to be deceived in a photographic portrait, in which the face is fixed at one expression, and that, very often, an assumed one. Referring once more to the prison portrait gallery, the uncomfortable reflection is forced upon us that it is quite within the bounds of possibility that an innocent man may occasionally have been sent to durance vile through an accidental likeness to one of these photographs in the keeping of the police. It may be urged that such a conviction would be impossible in the case of a man of unblemished character, who would generally find it easy to prove an alibi. But how about the man of shady antecedents to whom suspicion would naturally cling? A photograph in the police album which bore sufficient resemblance to him might form the closing link in a chain of circumstantial evidence, and yet all the time the man might be innocent. We know well enough that again and again innocent men have been sent to prison, sometimes to the gallows, and it would seem that a photograph, unless corroborated by more certain means of identification, might be the means of bringing about that awful and lamentable result.

THE FUTURE OF THE ROYAL PHOTOGRAPHIC SOCIETY.

[President's Annual Address delivered at the Meeting on October 8, 1901.]

The chief difficulty involved in the President's duty to deliver an address is presented by the selection of a subject of general interest to the members of the Society. Last year I endeavoured to trace the progress during the last century of the particular science which has evolved the photographer's modern drawing instruments—his photographic lenses. Upon this occasion I do not propose to specialise in any branch of the science, but briefly to present to your careful and earnest attention the prospects of the Society itself, and to ask every member individually to assist in helping me to realise my promise, when you did me the honour of electing me your President, to endeavour to safeguard its best interests, and to raise the status of the Fellowship.

The Society is probably to-day in a more sound and successful position than it has ever been. Let us hope we have deserved our success, but now is the time to "keep our powder dry," for it is certain, at any rate, that we cannot go on commanding success without deserving it.

In expressing the outcome of long and careful thought as to the best means of maintaining and improving our status, I have above all things striven at self-elimination, and have endeavoured to provide an argument which I hope may be as true for each individual mind as for my own, and am confident that you yourselves will form a judgment free from personal bias. I do not claim to be a pioneer in this direction; but to avail myself of an uninterrupted opportunity of appealing to my hearers and the membership at large through the medium of the "Journal," by giving expression to the thoughts and desires of many of the Society's most earnest supporters. Your reply can be given in no uncertain voice by adopting any or all of the suggestions made.

In brief, our aim and object should be to act more scientifically in dealing with our constitution, and to alter it where necessary.

From a purely business point of view, the Society according to its constitution and articles is, in general, in precisely the same position legally as a limited liability company, except that we do not make profits. As such, it seems to me, we ought to have a paid Secretary and Librarian whose duties shall be to attend all meetings of the Society and Council, to take charge of the library and other property of the Society, and generally to take instructions from the Council as to the management of the affairs of the Society. Our present and past Honorary Secretaries and Librarians have earned our gratitude by the work they have so ungrudgingly and unselfishly done. We cannot, however, expect gentlemen otherwise occupied in the business of life to devote their whole time and attention to the Society's interests, nor to bear responsibilities which have arisen and are likely to arise from the rapidly increasing membership. The appointment of an Honorary Foreign Secretary is well worth your consideration and would be much valued. A distinguished man in this position would enable us to be more in touch with our foreign contemporaries in all matters of photographic interest, and might promote personal relationships at photographic congresses and reunions.

Two years hence the Society will have attained its Jubilee. We can confidently look forward to this celebration being carried out in a manner worthy of the occasion, and your next Council will probably commence arrangements, when the services of a foreign secretary will be invaluable.

The Council is essentially the backbone of the Society. A strong and influential Council and the future success and advancement of the Society are synonymous. I venture to suggest for your earnest consideration that the Council of the Royal Photographic Society should include a wider variety of interests than at present finds representation here. The adoption of this principle would result in the choice of the Executive of the Society from among: Exponents of pure science, and its application to other sciences (Astronomy, Photomicrography, Physics, Photogravure, Colour processes, Metrophotography, &c.), representatives of the art, and the professional photographer's interests.

Objection has been raised, before now, to electing a Council in which there is a preponderance of scientific interests, in case the business management of the Society be overlooked. This argument does not appear to be at all a sound one, for a body such as that suggested would at any rate act scientifically, by avoiding the not infrequent tendency to invite the amateur to do the work of the expert. From the business aspect, committees would be nominated by such a body for any special work, with due regard to the particular ability required for its performance, and by this method it would be reasonable to expect that the various committees so appointed would invariably be elected upon a sound basis, although not necessarily chosen from the Council itself.

With a Council such as that proposed we should seldom be at a loss for important and interesting papers in every branch of the subject. Again, your Council has upon several occasions had under consideration the claims of the beginner in the various branches of photography, and it is not difficult to see how good work might be done in this direction by the institution of elementary courses, on a parallel with the Cantor Lectures delivered at the Society of Arts.

If we determine to make the Council more representative we are bound to succeed. We have at present a large and influential membership, upon which we can draw in a less cramped manner than hitherto, and further we may expect by this action to increase both the membership and Fellowship in the near future.

The Society at present numbers just over nine hundred members. It has been ascertained that at the last election we received only forty-four nomination papers, and as five of these related exclusively to the judges, thirty-nine only nominated for membership of Council. Again, a hundred and seventy-seven only voted for the Council, so that roughly about 4 per cent. of the entire membership nominated, and under 20 per cent. voted. It is difficult to believe that 80 per cent. of the members are indifferent as to the return of the Officers and Council. Every member, the man at a distance, or the man in town, has proved his interest in the Society by the fact of being a subscribing member. Cannot every member be persuaded to feel his share of responsibility also, and to use his influence to raise the status of the Council, by voting, if not by nominating.

The statistics given prove that the numerical weight of nominators' names are quite an insufficient guide to the voter, who may not be acquainted with the qualifications of those for whom he has hitherto voted, and although at one time the inclusion of nominators' names in the balloting paper appeared to me to be best in the interests of the Society, I am now convinced that the best and probably the only way to improve the status of our Council, is to abolish nominators' names in the future and to press the electorate to vote for merit alone. It is not obligatory for any member either to nominate or to vote for the full list of officers and council, but the influence of more general voting will be strongly felt, if members will conscientiously do so for those they *know* to have done good work.

Fellowship.—At the date of the incorporation of the Society, January 1, 1895, all members of the Society had the option of becoming Fellows. Immediately after that date the qualification for the Fellowship was decided by the Council, and conferred as an indication of ability in one or other of the branches of photography. In the original rules it was provided that "members desirous of becoming Fellows shall send an application to the Council, setting forth their qualifications, and the Council shall decide whether the candidate shall be admitted to the Fellowship." The first method in vogue was that the applications were read at one meeting of the Council, and voted upon at a subsequent meeting, the application in the meantime being returned to a sub-committee if necessary. The award of the Society's medal was at that time deemed a sufficient qualification, and the following heads were named as those under which a candidate might be admitted:—

Contributions to photographic knowledge.
Dissemination of photographic knowledge.
Inventions in photography.
The passing of an examination in photography approved by Council.
Any considerable service to photography.

It was enacted that at least two-thirds of those present must vote in favour of the candidate to secure his election.

The new articles came into force in 1897, and in November, 1893, the present system obtained, whereby application could be made for admission as a Fellow under general qualifications, or as a student. The methods of Council also changed slightly, but the Society's medal still remained a qualification. A standing committee was appointed to meet four times a year, notice of these meetings being advertised in the "Press." The Committee's report was discussed at one meeting of the Council, and voted upon at the next, the majority of two-thirds voting in favour holding good. In 1889 it was further agreed that any honorary officer might upon application be at once admitted a Fellow.

In 1900 it was resolved that the committee be more stringent in their examination of the candidate's qualifications, and were also to be at liberty to impose examinations, and the qualification of the Fellowship by the award of the Society's medal was discontinued. The same policy has been pursued in the present year, the Fellowship Admission Committee sitting upon three occasions instead of four.

It will be observed that, since the foundation of the Fellowship, it has been the constant endeavour of succeeding Councils to formulate qualifications which have steadily tended towards improving its status, and at the present time an applicant must be very highly qualified in order to obtain the distinction.

Qualification by examination is still before the Council, and I hope before long a definite scheme may be submitted to applicants under the student's form which may be final. So long, however, as the work of the Society has to cover the wide ground it desires to embrace, qualification by examination alone cannot be expected to rank as the sole qualification. If we cultivate a proper sense of proportion we shall, in addition, elect a Council of which the Society may be justly proud, and whose bestowal of the honour of Fellowship may be duly valued by deserving applicants.

Judges.—Our present Article of Association states: "If awards be given, the judges shall be elected by the members of the Society." It seems to me that this is a very anomalous position for a large and influential Society so long as this Article is deemed to include judges who are not members of the Society, and it is the opinion of many that it would be a much more dignified position for the Society to take up if the judges in future were elected from, as well as by, its own members. The first President of this Society was also President of the Royal Academy. If we were fortunate enough to include in our membership a number of artists, members would doubly appreciate the judgment of an artist who was also a skilled photographer. The criticism of artists who are not photographers will always be appreciated by photographers whose aim is pictorial effect; but, without a considerable and progressive knowledge of the technique of photography, it must be a very difficult matter for the average artist to inform himself of the possibilities due to constant variations of graphic expression applicable to photography.

In addition to the main points to which I have called your attention, there are some minor matters in the Articles of Association which I will now read. As an appendix I have written out, in order, these Articles which I think require amending, and the proposed form of amendment, and I venture to hope that a requisition

may be signed by not fewer than the twenty members of the Society necessary, asking the Council to convene a special general meeting for the purpose of making these alterations. The proposed alterations will be laid upon the table, and the manner in which you respond to this appeal must be for me a sufficient recognition of an earnest desire and an unflinching attempt to ensure the future prosperity of this Society, which I have always had most sincerely at heart.

THOMAS R. DALLMEYER, F.R.A.S.

ANTIPOINT.

[Reprinted from the "Camera Club Journal."]

THE current number of the "Journal of the Royal Microscopical Society," contains an article which will perhaps have some interest for our readers.

The paper is itself a contribution to the discussion of a theory of the formation of the image in a microscope, which goes by the name of Professor Abbe, of Jena, being known as the Abbe theory, and the main position established is that a luminous point upon the stage of the instrument is represented by the image, even when formed by a perfectly corrected lens, not by a single point, but by a luminous surface, the shape and dimensions of which depend upon the aperture through which the image-forming beam passes up the instrument.

Every aperture, however extended, has its own proper point image, and the condition assumed for the purpose of elementary dioptrics, that the image of an object produced by a lens corresponds point for point with its original, is never realised in fact. Every luminous point of an object focussed by a lens is focussed in some definite shape, which shape has nothing to do with the correction of the lens, but is determined solely by the form and curvature of the wave-front which the lens transmits; determined therefore in part by the size and dimensions of the effective surface of the lens, in part by the refractive index of the lens in relation to the surrounding medium. The image so formed being the optical equivalent of a point, but not truly punctiform, is called an antipoint, and a large number of experiments detailed in the paper show how the image of an object is modified and the resolution of the image itself affected by the shape and dimensions of the antipoint.

It is thus made apparent that for the discussion of all questions involving the resolving power of any optical instrument, the form of the antipoint is of capital importance. Until we know the form and dimensions which it takes, the degree of correspondence between an object and its optical image must remain unknown. The practical determination of this point presents no difficulty. It is only necessary to take a luminous object sufficiently small to be sensibly a luminous point, and to view it under the given conditions, when the antipoint will actually appear in the field of view. But the mathematical law connecting point and antipoint will be found to have been very fully investigated, and also to be susceptible of a very exact statement. The first investigation of this most interesting topic was undertaken by Sir George Airy, who in 1835 published his results in the "Cambridge Philosophical Journal," vol. v., page 283, and subsequently renewed the investigation in his "Undulatory Theory of Optics," pages 60-82, edition of 1877. The immediate subject of his inquiry was the resolving power of the telescope for fixed stars—the problem of point and antipoint pure and simple. He did not advance to the consideration of the way in which images could be built up of antipoints; and although the one follows, as we have seen, extremely simply from the other, it may be that the limitations of Sir Geo. Airy's statement have been mistaken for limits of his theory. Later, i.e., in 1896, Lord Rayleigh, writing, as it would seem, independently of Sir Geo. Airy's work, applied the same principles to the resolving power of the microscope. His paper appears in vol. xlii. of the "Philosophical Magazine," page 167.

When a train of wave-fronts, that is to say, a series of wave-fronts advancing in orderly and rhythmic sequence—when a train of light wave-fronts is intercepted by an opaque screen, the segments of the successive wave-fronts which escape past the edges of the screen or through apertures in its expanse pass on and become a source of light in the space behind the screen. But, as is well known, they do not illuminate the whole rearward space. The luminiferous impulse which they convey is propagated in what are sensibly rectilinear paths, and this rectilinear propagation of light gives rise to sharply defined boundaries between the lighted space and the shadow. The boundary, however, is not as simply rigorous as we commonly suppose. Careful examination shows that it is transgressed by the shadows which invade the lighted region and by the light which in its turn makes inroads upon the shadow. These boundary phenomena, confined within limits too narrow to affect sensibly the common phenomena of vision, have a very sensible effect upon the images formed by means of shadows in various optical instruments, and pre-eminently in the microscope, where they give rise under high magnification to fringes, intercostals, and other such-like appearances which sometimes completely obscure the true image. Their investigation, although of primary importance in the theory of the microscope, and presenting in fact no serious difficulty, has been singularly neglected hitherto. We have already seen how, by the simple expedient of observing by an easy experiment the form of the antipoint, and then by an equally easy construction developing a geometrical figure in which antipoints replace the points of nature, it is possible to pass from an object on the stage through an entire series of the varying appearances which that object will take on when viewed through an optical instrument.

We have, then, to consider how a segmental wave-front illuminates a point which lies within its own geometrical shadow; for, as has been already mentioned, the reciprocal case of the imperfect lighting of the illuminated area near the shadow boundary is of no consequence for the present purpose. The light which thus passes into the zone of shadow is called diffracted light, and its propagation, like the formation of the shadow itself, is due to the interference of successive waves with one another's work. To this conception of interference of light we rise by considering all the points upon a wave-front as so many independent foci, sources of light from which the luminous impulse is transmitted in all directions. These foci, however, are co-ordinated to one another by a double law; every one shines with exactly the same brightness as every other one, and vibrates in exact synchronism with every other one in the same wave-front. We may then estimate the whole illuminating effect of the wave-front on any given point in front of it by adding together the impulses which every part of the wave-front would send to that point if it stood alone. For the case of a focal point, which stands equidistant from all parts of the segment, this addition is a very simple matter. All the several impulses will arrive simultaneously and in equal phase, and the aggregate effect will be the simple total of the individual effects. The whole disturbance produced by any one wave-front under these conditions falls as a single blow at a single indivisible point of time. There can be no interference by one wave-front with the work of its predecessor, but every one in turn produces its whole effect without impediment from wave-fronts that have gone before, and without diminution from those that follow. Here the intensity of the resulting light is at its maximum.

But a point excentrically situated is in a different case. Here the impulse received from the extended wave-front does not fall as a single blow, for the simple reason that the distance of the receiving point from one point upon the wave-front differs from its distance from another point. Hence those parts of the whole impulse which are received from nearer points upon the wave-front will arrive earlier than those other parts that had farther to travel, and the whole effect of the wave-front will arrive in a stream of partial effects—a pressure, so to speak, lasting for a finite time, instead of a sharp or single blow. Now this extended duration of the working of any one wave-front on the excentric point gives occasion for the successive wave-fronts to overlap in their action. Before one has finished another must have begun, for there are no gaps in their ranks, and so arises the possibility of interference. And this is not a possibility only, it is a thing that must occur; for two wave-fronts cannot (save exceptionally) concur in time and space without more or less counter-working one another. The counter-action may be very slight when they are nearly in the same phase, and there is one, the exceptional case just referred to, in which they simply reinforce one another without any counter-working. That occurs when the successor is one exact wave-length or any integral number of wave-lengths behind the predecessor. In that case the two wave-fronts will coincide in phase, and such wave-fronts must of necessity follow one another at intervals which are integral multiples of the period of oscillation. But all the

intervening wave-fronts must coalesce only imperfectly with their leader, and therefore must counter-work it and one another more or less. The extent to which they will thus counter-work one another is evidently measured by their difference of phase. A complete oscillation comprises an excursion first in one direction and then back again in the opposite direction, like the forward and backward swing of a pendulum. If two wave-fronts overlap one another, therefore, to the extent of half a period, they will exactly neutralise one another, for the one will tend to elicit a movement the direct opposite of that which the other tends to set up. These equal and opposite forces can produce stress, but no movement, and thus we see that by interference the same set of undulations, which at the central point or focus of the wave-front give rise to bright illumination, may at a neighbouring point in space set up a state of strain of which our eyes can give us no account. Such, in broad outline, is the undulatory theory of shadow formation.

This explanation must, however, be pursued a step farther, for it is not yet apparent why over one region the successive wave-fronts should always harmonise so as to reinforce one another and produce light, and over another region, sharply divided from the first, should interfere destructively and produce shadow. This, however, will be very clear when we consider how small a magnitude a wave-length of light is. Something like one-fifty-thousandth inch comprises a complete set of wave-fronts of light; that is to say, within that small space, measured radially from any focal point, you may find, at any given instant of time, a set of wave-fronts exhibiting every possible phase of the light oscillation. If all these wave-fronts are brought together at any given point in time and space, they will evidently cancel one another; for the series will, of course, contain in the second half an impulse which is the opposite of every impulse in the first half. Hence, whenever we find that a given segment of a wave-front occupies a whole wave-period in delivering its consignment of energy at a given point, we may infer that the discharge is not effected without impediment, that succeeding wave-fronts will enter into competition with it for discharging facilities, and that the visible effect will be diminished accordingly. If the period of discharge be exactly one wave-period, and if the rate of discharge be uniformly maintained throughout that period, we may infer that all possible phases of the luminiferous impulse are concurring at every instant, and the result will therefore be a strained but total darkness. A case may be supposed in which the period of discharge will occupy longer than a complete wave-period, say, for example, $30\frac{5}{8}$ wave-periods. In that case, thirty complete sets of undulation phases will at any instant concur and cancel one another. There will be $\frac{5}{8}$ of a complete set over. But this assortment of undulation phases represented by the fraction $\frac{5}{8}$ will not be all concordant. On the contrary, the phases of the fifth eighth will be opposite each to each to the phases of the first eighth, and these two divisions will, in like manner, cancel one another. There remain three-eighths of a single set of phases uncancelled, and these, although not mutually destructive, are nevertheless only imperfectly attuned. The effect which they will produce may be determined by considering them as equal concurrent forces coinciding at a point in space and inclined at angles proportionate to their difference of phase. This method of solution leads to the construction of a polygon of forces; and if we consider the total impulse from each eighth as a single force, we shall evidently obtain a figure in which the three equal sides represent the three equal impulses, and the common angle of inclination of these sides to one another is equal to $\frac{2\pi}{8}$ the proportion which their common difference of phase bears to a complete wave oscillation. The fourth side will, on this hypothesis, represent in length the amplitude of the resulting wave and in direction its relative phase. This would give us an approximation to the true result; but as the impulses actually received are not sharply distinguished by marked differences of phase, but pass into one another by imperceptible gradations, the true result itself must be reached by substituting for the three sides of the supposed figure the corresponding arc of a circle having the angular value $\frac{3}{8}\ 2\pi$. The chord of that arc will then represent in magnitude and direction the amount of light received by the point in question, and its phase relatively to the contemporaneous phase of the wave-front from which the illumination is derived. From this it is easy to calculate that the total effect of the impulses transmitted through the given aperture to this point is only $\frac{2 \sin \frac{3}{8}\pi}{30\frac{5}{8}}$. This, then, affords a measure of the illuminating effect of the wave-front segment upon a point of space so situated with regard to it. Whereas it would send to the focal point an impulse proportioned to its whole expanse, the impulse which the point now under discussion could receive would be proportioned only to that which the given wave-front could discharge in three parts of time out of $30\frac{5}{8} \times 8 = 245$ parts, these three parts of time being utilised only to the extent of a discharge at the average rate of 78 p.c. of the full discharging capacity of the segment. Thus a point of space asymmetrically situated with regard to the wave-segment, and so much over its geometrical shadow that thirty and five-eighths sets of complete undulation phases concur to reach it from the wave-front segment at every instant of time, receives only 78 p.c. of $\frac{3}{245}$, = say 1 p.c. of the light received by the focal point. Now, the distance over the shadow boundary which suffices to cause such an amount of retardation as is here assumed, in the discharge of the light impulse, is very small. The wave-length of $\frac{1}{50000}$ in. multiplied by $30\frac{5}{8}$ amounts only to about the sixteen-hundredth part of an inch. If we suppose that the wave-segment has a rectangular form, a diameter of half an inch and a focal length of ten inches, it is easy to see that a displacement of no more than $\frac{1}{80}$ in. away from the focal point would plunge the observer into a shadow where the amplitude of the light wave was reduced to this small fraction $(\frac{1}{100})$ of the focal amplitude. If he goes farther still away, the darkness will grow denser without sensible mitigation, for the numerator of the fraction can never increase to more than $2 \sin \frac{\pi}{2}$, and the dominator increases continually and indefinitely.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Third Notice.]

Professional and Trade Photography.

Excluding some twenty frames by various photographers, which are arranged and hung by the Society's officials in the space dedicated to the work of those professionals who do not desire to reserve a definite amount of space, and a collection of the works of the late H. P. Robinson, which are exhibited by his son Mr. Ralph W. Robinson, at the Society's invitation, there are seventeen exhibitors in the professional section. Of these, five of the exhibits are those of trade photographers, enlargers, etc. It is notable that three of the twelve professional photographers are ladies. When we take into consideration the small number of lady photographers in proportion to those of the other sex, this fact seems to point to an amount of business enterprise on the part of the ladies which is very creditable to them.

In the South Gallery Messrs. F. and R. Speaight, of 178, Regent-street, in the decoration of their space follow somewhat the same lines as last year. Their pictures, however, are better arranged, and are equally interesting examples of that branch of photography, the portraiture of children, they have made their speciality. The exhibit is bright and taking, and at the same time in good taste.

Miss Catherine Edmonds, of 118, Westbourne-grove, W., has a tastefully got up and well-arranged panel. She has evidently exercised greater care this year in the selection of her pictures, and this in itself naturally gives a better impression of her capabilities. A more critical examination of the work convinces us that she has really advanced. Many of her pictures are examples of charming subjects, tenderly and gracefully treated.

Mr. Furley Lewis, of Stratford Studios, Kensington, occupies an increased amount of space, which he worthily fills. His work shows a great improvement on that of last year. Many of his pictures are of well-known characters, and interesting on that account. Such subjects as John Burns, M.P., and George Bernard Shaw lend themselves to his characteristically strong and virile treatment, and that he is also capable of a light and dainty touch is evidenced by his female heads. The panel is tastefully arranged, and, although the wall-covering he has chosen, together with the dark mounts of his pictures, give his exhibit a somewhat sombre aspect, it is in keeping with the style of his work.

Messrs. Langfier, Ltd., of 23a, Old Bond-street, W., occupy the whole of the wall facing the door, and make an imposing display. Most of their work is of more than average dimensions, and among it are many examples which possess great merit, but there are in-

stances where it is evident that the temptation to include that which is not up to the general standard of excellence, on account of the celebrity or high social position of the subject, has been too strong to be resisted. Included in the exhibit are three frames containing a large number of exquisite ivory miniatures, mounted in gold, and in some cases jewelled but the legitimacy of the inclusion of these and a portrait in water colours, in all of which photography plays no part, in a photographic exhibition is open to question. The arrangement of the pictures and the decoration of the wall are very effective.

In the North Gallery, George Boncas, of 120, Mile End-road, E., exhibits a three-quarter length, life-size, portrait of the Greek Archimandrite in ecclesiastical robes, which makes a bold imposing picture, also two head studies of less merit.

Mr. J. Thomson, of 70a, Grosvenor-square, shows a large selection of portraits of Royalty, the nobility, and other eminent personages, with which he might have made a very attractive and interesting display, but he has evidently misunderstood the situation. He seems to have started with a scheme which would have accommodated considerably less than half the number of frames he actually hangs. Then, finding he must either abandon his scheme, or make a selection of the pictures he has brought, he has taken the former course, and put his frames up just wherever they will go.

Miss Enid Wigram, of 13a, Pembridge-place, W., has an exhibit of fairly good professional work of the kind that appeals to most classes of the public.

Mr. S. J. Beckett, of 20, Baker-street, W., in his aim at variety has managed to give the impression that his exhibit is one of odds and ends. A close inspection of the pictures shows that several of them are really excellent, and that with several of them weeded out, especially that which is described as a "bromograph," he would have been able to make a very good show indeed.

Messrs. Lambert Weston and Sons, of Folkestone and Dover, show some admirable studio work, and they have arranged their exhibit in a manner which is successful in displaying their pictures to advantage. They have not been very happy, however, in their signboard, which, though nothing could be said against it, if placed over a showcase in a public place, is hardly in keeping with the Royal Photographic Society's exhibition.

Messrs. Reinhold Thiele and Co., of 66, Chancery-lane, have an exhibit of photographs taken by Mr. Thiele during the earlier period of the war in South Africa. They are not only interesting on account of the vivid insight they give of the incidents of actual warfare, but are very commendable as photographs. "The Royal Canadians storming a kopje at Sunnyside," is wonderful. In addition to war photographs, a frame containing a series of photographs illustrating the varieties of fish caught on the Cornish coast is also very interesting from more than a natural history point of view: making one of the fish to appear to be swimming out of the frame is a quaint conceit.

Mr. T. C. Turner, of Hull, and Upper-street, Islington, N., has chosen his pictures for exhibition and arranged them in an admirable manner. His panel, like that of last year, is a study in showcase arrangement. He is evidently one of the comparatively few who realise that a smaller number of striking works make a much more impressive show than a crowd of them. It is a very interesting exhibit from many points of view.

Among the miscellaneous professional work the heroic size enlargement of Sir Thomas Lipton on board his yacht, by Charles Sweet, of Rothesay, will attract notice, if only on account of the recent event. Robert Johnson, of 292, King's-road, Chelsea, has four creditable portraits, and Ralph W. Robinson, of Redhill, has a series of small portrait studies, which are very dainty. His portrait of the late H. P. Robinson is one of the best of the deceased gentleman taken in recent years, and it will awaken tender memories in many who visit the exhibition. Miss Constance H. Ellis, of Guildford, has a head study, and H. Stewart Wallace, of Edinburgh, A. W. Goodman, of Belvedere, W. Ashley Debenham, of Ryde, and Fred W. Jackson, of 35, Bedford-street, Strand, all exhibit landscape work.

We have already mentioned that, hung in one of the galleries devoted to this section, is a collection of prints from the negatives of the late H. P. Robinson. These are all priced for sale, and afford an opportunity for those who admired the work of that departed master of our art to acquire specimens of it.

Among the trade photographers the Autotype Company, of 74, New Oxford-street, have the most important display. They occupy the whole of the end wall of the North Gallery, and include in their exhibit copies of paintings, enlarged portraits, and views, architectural and animal studies, printed in carbon, examples of collotype printing, and various items. Needless to say, the whole of the work is of that high standard which is characteristic of the Autotype Company. We cannot, however, compliment them on having made the best use of their opportunity. They have crowded their wall in a manner which was obviously quite unnecessary, considering the amplitude of their space, and in including specimens of their novel bright tints in carbon tissues, they have been unmindful of the effect of such extremely forcible spots of crude colour on their more sober surroundings.

Messrs. Morgan and Kidd, of Richmond, have a bright exhibit. Their centre piece is a three-quarter length life-size enlargement in bromide, which is technically a fine piece of work, and their carbon enlargements are equally good. A case of vitrified enamels is well worthy of attention by photographers who are on the look out for a novelty.

Messrs. Thomas Illingworth and Co. occupy one of the walls in the South Gallery, and show specimen carbon prints and enlargements of various tints, made with tissue of their own manufacture, also enlargements in bromide, and other kinds of trade work. An interesting feature of their exhibit consists of a series of reproductions in carbon of London topographical views from oil paintings made in the eighteenth century. These are exhibited by permission of the London County Council. Their wall, although the separate items on it are all undeniably creditable, leaves something to be desired in its arrangement.

Messrs. Curzon, Robey and Co., Ltd., of 7, Newman-street, W., show capital examples of commercial photography, half-tone engravings, and collotypes. Noticeably good are several reproductions in platinotype, from pictures by the Old Masters.

The Rotary Photographic Company, Ltd., have some fine bromide prints of statuary, both enlarged and made by contact; also reproductions of paintings, drawings, and other subjects, all in bromide, and excellent in quality.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The first ordinary meeting of the members of this association was held on Friday, October 4, 1901, at the Royal Photographic Society's house, 66, Russell-square, Mr. Thomas Bedding, F.R.P.S., in the chair.

The minutes of the last meeting having been read and adopted, the hon. secretary read letters and telegrams from several who were prevented from attending the meeting, viz., H. Howes, of High-street, Irthlingborough; G. W. Morgan, of Aberdeen; F. Chambers, of Manchester; Harold Baker, of Birmingham; W. Barry, of Hull; and T. Birtles, of Warrington.

The Hon. Secretary then read the report of the committee for the past three months, previously stating that the membership then stood at 422.

REPORT OF THE GENERAL COMMITTEE

to the Members at the Second Meeting of the Association, Friday, October 4, 1901.

Your committee are pleased to report that since the inaugural meeting of the Association on Tuesday, July 2, the membership has increased from 370 to 422; and that several candidates for admission are awaiting election. The Association is already one of the largest photographic societies in the world.

No meetings of the committees could be held in the summer vacation; but during the past few weeks the general committee, elected on July 2, have met twice, the general purposes sub-committee have also met on two occasions, and the local branches organization sub-committee have held one meeting at York.

The Professional Photographers' Association Handbook, containing the objects, rules, list of members, officers, committees, has been sent to all members. A considerable number of these handbooks, together with a supply of membership application forms, have also been distributed amongst interested professional brethren.

Your committee are gratified to announce that branches of the Association have been formed at Aberdeen, Hull, and Edinburgh, and that arrangements are in progress for the formation of other branches at Birmingham, Liverpool, Manchester, Norwich, Brighton, and other large centres.

As evidence of the interest taken in the affairs of the Association, every committee and sub-committee meeting has been largely attended; twenty out of the twenty-four members participating in

the work. In no case has an absentee member failed to assign a reason for his non-attendance. This regard for the welfare of the Association will, it is hoped, convince the members that the executive thoroughly realise the onerous nature of the work they have undertaken.

The expenses of the Association in the early stages have been necessarily great, and so far the committee do not find themselves in a position to secure permanent offices for the use of members. By the kindness of the Hon. Secretary, the meetings of the committees have been held at 51, Baker-street, but it is hoped that a speedy increase of membership and funds will justify them in taking rooms in which the meetings may be held, and to which members may have access at all times. It is suggested that a donation fund be opened for this purpose.

The thanks of the Association are due to the Council of the Royal Photographic Society for permission to hold this and the General Meeting on July 2, in the rooms of the Royal Photographic Society. Similar thanks are also due to the Right Hon. the Lord Mayor of York, for permitting the Association to meet at the Mansion House, York, on Monday, August 12.

Mr. W. G. Parker moved the adoption of the report as read. Mr. Skilman seconded the motion, and the report was carried nem con.

Mr. T. C. Turner (Hull and London), the hon. sec. of the committee for promoting the local centres, gave an account of the work that had been done under his management. At the York meeting, the Lord Mayor welcomed the gathering in some of the most beautiful state rooms in England. The attendance, if not numerous, was at least enthusiastic in the discussions that took place. They were rather unfortunate in having the meeting during the summer months, as was the case. Everybody was busy, and it was not surprising that more could not attend. The extent of the sympathy that was felt for the movement was shown in a very practical manner by the way in which Hull rose to the occasion directly the time was ripe for concerted action. Out of two dozen photographers in the town twenty would be found upon the lists of the new association, and so great had been the enthusiasm of the first meeting that the local people had insisted on monthly meetings in future. He thought there could be no better proof of the demand for such a movement as the new association than this. Hull photographers had met twice, and the questions discussed had been the burning ones of dealers' discounts, invitation sittings, and ownership of negatives. The first question had been aired in the press and by letters from photographers. The second had been the cause of a very animated discussion, and so had the last. Process workers were writing to photographers, asking for the surrender of the negative and at the old price, but a strong agitation was in progress all over the country, by which it was expected that the new move on the part of the illustrated press generally and these process people would be checked. Mr. Turner named a paper that had written round for negatives, and said that the request had been met by a solid refusal. For the moment there was a little less business, perhaps, but in the end he believed photographers would win. The paper had to send down its own photographer to do the work, with the chance of bad weather and inferior results, whereas the photographer who knew the district was ignored. Turning to another part of the country, he was glad to hear of the successful efforts being made in Edinburgh by Mr. Moffat and Mr. Crooke in the same direction as that at Hull. They had brought in a lot of members. Similarly, in Liverpool, the organization was in the excellent care of Mr. Mowll and Mr. Watmough Webster. In Birmingham a meeting would be held in a few weeks, while Mr. Spink, in Brighton, and others in various other places, were mustering the forces of the Association. It should be remembered that the men who were undertaking these difficult tasks were in all cases exceptionally busy men. The fact, therefore, that they were so energetically taking on these new and additional duties, spoke well for the future of the Association and its work. On his own side he had repeatedly had to devote many hours to correspondence, after his business was done, in connection with the Association. He considered that the publication of the Handbook would get over much of this correspondence, which, of course, was to a large extent with people who wished to know of the intentions of the Association. Mr. Morgan, of Aberdeen, had experienced the same trouble, but his enthusiasm for the cause was very strong. So far, the centres had been confined to certain large towns, but as the enthusiasm spread, so would the centres which had been chosen at the outset to suit the members of the working committee. He fully believed that at no distant date the membership would reach beyond a thousand, beating the German association concerned with like affairs.

Mr. Turner then read the following notes concerning the question of dealers' discounts, as made at a recent meeting:—

THE DEALER QUESTION.

The attempt to coerce the professional into buying through the local dealer is not likely to be successful. The professional must be sure his supplies are absolutely fresh, and that they have not been stocked on shop shelves. Few retailers stock for the benefit of photographers in business. The majority of provincial dealers have established a clientèle more or less antagonistic to the professional's interests, and have thereby loosened their claims to professional support. The representatives of big London warehousemen call upon professionals and local chemists, etc., allowing the latter special discounts, knowing that while they are often enough photographic competitors, they are seldom of service to local professionals.

The manufacturer's cry of "Protection for the dealer," is therefore made the excuse for mulcting the professional in a greater profit and this, too, when professionals in many towns are better buyers than the whole of the non professional photographers of the district aggregated.

A friend of the dealer, expressing his views in THE BRITISH JOURNAL OF PHOTOGRAPHY, for September 27, says:—"Is it right that the dealer, whose profit is on the re-sale, should be put on the same terms exactly as the professional is on his work?" Well, does not the chemist get his profit on his chemicals as well as on his skill and work in dispensing them? Does a medical man who makes up his own prescriptions buy his chemicals from a local retailer?

If professional photographers are able to conduct their business without feeling the necessity of intermediate service, is there an excuse for these extra middle profits, and does the present position of professional photography allow of carelessness in buying supplies? We are assured that "Never a meeting of the Association (Plate Makers') passes but full dealers' terms are granted to professionals, yet only those inside know how small a percentage really continues to do a dealer's trade." Quite so! The Association, then, recognises this, and yet is not wise enough to see that its best customers would be the men who desire no subterfuge, but the common-sense recognition of an altered situation.

A professional buying sensitised papers from the manufacturers at only 10 per cent. discount does not on that account go to a dealer for his supply. Rather he resents the manufacturers' extra profit, and to the extent of his discontent is so much the worse customer. Manufacturers in recent years have lost no end of amicable service in recommendations, loan of good negatives, and so on, through this stupid obstinacy towards the men who are their steady and best support.

Then, if it is true some professionals are becoming dealers to save discounts in a roundabout way, will it not in the end divert the trade from men whose business may be legitimate enough in supplying the amateur demand?

If the manufacturer wishes to protect the small local chemist-dealer, will he not achieve his desire best by treating the professional to equal terms? Professionals in the main do not desire to stock for re-sale, although they hold in many towns an infinitely larger stock of sensitive material than the dealers, and they move it more regularly.

In fact, this is often taken advantage of by amateurs, who will buy from a professional of high repute, because they know his stock is likely to be fresh, and that if the plates are good enough for use in his studio there can be no suspicion of inferior manufacture. Does not some such thought also underlie the ever-recurring question: "Whose plates do you use?" And who best qualified to answer—the man who sells thousands, or the man who develops thousands a year?

The best plates to-day are those most largely used by professionals And they need no dealer's recommendations to make their virtues further known. A professional photographic press, a few sample boxes in the post!! What more can be needed between the factory and the studio? And does not this apply to all sensitive material?

Continuing, Mr. Turner said that was a digest of a nearly two hours long discussion at Hull. As a result, a few of the Hull men were going to do their very best to stop their support of those who, though friends in the past, would not see the question in the light that this meeting considered a fair one. Business would be diverted from those who allow preferential discounts to competitors who, when opportunity offered, were not averse to copying an established photographer's work and making cheap enlargements. Mr. Turner proceeded to point out that he, with many others, ran a studio with a large staff, and kept it going, only to meet with competition from men who were able to command higher discounts. The iniquity of the thing was obvious, and the matter was a pressing one. It was agreed that these competitors on unfair terms must be attacked, and also the men who were backing them. Photographers must be guided by the principle—the greatest good for the greatest number. There were men he knew who did not look at the position in such a light. So long as their own position was a sure one, others could look out for themselves. The object of the Association, however, was that they must all help one another to struggle against the outsider, and secondly to remedy the abuses that exist in their own midst.

Mr. G. V. Simmons said that, looking at the Handbook, he was struck by the very strong list of supporters. Bearing in mind one of the great tasks before the Association, that of obtaining fair terms from the manufacturers, it occurred to him that the Association was so strong that its members were quite capable of starting on their own account a sort of co-operative manufacturing business that would supply all their wants from its own factories. As far as ordinary competition went, it must be endured, but they could walk away from the manufacturer, dealer, and local chemist, if his idea were adopted.

Mr. Martin Jacolette spoke of the injustice that professionals had to put up with in the matter of discounts. The chemist next door had a perfect right to sell what he liked, but it was not equitable that he should be able to buy cheaper than the professional, who consumed far more material.

Mr. Mullins, of Ryde, gave his experiences with the Plate Makers' Association at a time when he contemplated selling materials for amateurs, etc. He was told that the specimen order he proposed to place was not such as to entitle him to the dealer's terms he asked for, although he believed that the order was no mean one.

Mr. Rigden moved that the Committee be requested to at once take up the matter of manufacturers' terms to professionals. He thought that the Committee would be able to bring matters to a satisfactory issue.

Mr. Skillman seconded the motion, which was carried unanimously.

The Chairman said he had received a letter from Mr. Walker, of Islington, pointing out that Messrs. Salmon and Gluckstein, a firm of tobacco dealers, were issuing coupons for enlargements. The method was to send twenty of such coupons and 2s. 9d. with the photograph to be enlarged, and in return one got post paid a 12×10 enlargement, on plate-sunk mount 20×16, the original being returned undamaged.

Mr. Skillman spoke on the subject, and proposed that the following resolution be sent to the secretary of the firm:—That the attention of the Professional Photographers' Association having been called to Messrs. Salmon and Gluckstein's system of trading by means of coupons for cheap enlargements, this meeting desires to protest against their action as injurious to the interests of professional photographers.

Mr. H. E. Hull seconded the motion, which was carried unanimously.

A vote of thanks was passed to the Royal Photographic Society for the use of the rooms.

EQUALISING THE ILLUMINATION OF DARK AND LIGHT OBJECTS.

It will not be long before the merest tyro in photography becomes aware of the fact, that when exposing sensitive plates on outside subjects, in which more or less sky forms part of the picture, in nearly every instance, unless some special provision be made to equalise matters, an exposure necessary to bring out full details in a dark foreground will be found much too great to render the sky satisfactorily. Apart from such subjects in landscape work, where the sky and foreground offer such a difference in the amount of illumination, it will be found that there are very many other subjects in which violent contrasts in light and shade are met with, to photograph which satisfactorily required special treatment in exposure, whereby the brightest lighted portions of the view are retarded until the darkest parts are fully exposed. Subjects of this kind are seen in what may be termed close studies, or it may be even in landscapes which embrace dense masses of dark foliage in opposition to other portions of a view which are brilliantly lighted by strong sunshine. In the copying of oil paintings again, where dark sombre tones are seen in opposition to delicate sky effects, this same difficulty is met with, in perhaps even a more pronounced form, for it is well known that anything like success in photographing paintings can never be achieved unless resort be made to some method of dodging, whereby the illumination of certain portions of the sensitive plate be so modified as will prevent the highest lights being hopelessly over-exposed and buried, before the darkest portions are rendered with sufficient detail in the negative to print harmoniously.

For many years much ingenuity has been displayed to provide a mechanical means to counteract what may be termed violent contrasts in illumination, and among the various devices employed may be mentioned special shutters, which, in operation, permit of a longer exposure being given to a foreground than the sky. And, again, for special landscape work sky shades have been designed by which the same results are achieved by providing a movable shield that is capable of being altered in form so as to conform to some extent to the shape or contour of the skyline in the picture. A very excellent sample of this form of apparatus was that designed many years ago by Mr. Parker, of the West of Scotland Amateur Society, which, in the days when plates of less exalted degrees of sensitiveness were employed (such as Wratten's slow landscape plate of about 12 sensitometer) yielded most striking results by permitting quite a wide range of exposures to sky and foreground. The shutters, however, which years ago were designed for this purpose, partook more or less of the drop form, and upon the shape of the cut out portion of the drop depended, in a large measure, the amount of illumination accorded to the foreground and sky. These old-fashioned forms of metal and wooden shutters worked well enough in competent hands, but were shortly afterwards displaced by the well-known roller blind, and other forms of modern shutters, in which no provision is made for any equalisation of illumination, and therefore when such modern forms of shutters are employed, other means must be resorted to for gaining the results. It seems strange that so many of the useful little dodges and appliances which years ago were well known to professionals and amateurs alike should have been permitted to sink into what may with truth be termed disuse. Doubtless the rage for snap-shot work has militated against the more healthy form of landscape photography, as practised during the days of collodion, or even the introduction of the modern dry plate, and this rage for hand camera work has, with a large portion of amateur workers, at least, done much to curtail the employment of larger cameras, and with them to bring into disuse many of the little additions to a photographic outfit which twenty-five years ago proved so effective in landscape work.

Among other dodges employed nearly a quarter of a century ago for equalising exposures of sky and foreground and similar subjects, may be mentioned that of using a special form of diaphragm in the lens; not the least advantage of which lies in the fact that such forms if diaphragms are capable of being employed with almost any pattern of shutter. This effective little dodge consists in using a diaphragm placed obliquely to the axis of the lens, or as it may perhaps be more simply stated and easily understood, by placing the diaphragm in the lens at a slope instead of at right angles, as usually fixed in lenses. A little consideration will enable anyone to understand how differently a diaphragm placed obliquely to the axis of the lens will act when compared with one placed in the usual manner, for the diaphragm, when so placed, as may be said, to be sloping downwards, will permit of a much greater amount of illumination reaching the sensitive plate from the foreground than would be possible from the sky. Another also equally effective little dodge employed many years ago by expert landscapists was the placing, in front of the ordinary diaphragm of the lens, a piece of blackened brass of a V shape, base upwards: a few trials will soon indicate the proper position to place this in, and by means of this simple little contrivance quite a variety of effects in lighting, or rather in cutting off from a sensitive plate undesirable illumination may be produced. Such are among a few of what may be termed mechanical dodges employed by old landscape workers in shielding a plate.

Personal equation no doubt enters largely as a factor into this question also, for an experienced operator can achieve much without the aid of any mechanical appliance. It is well known that experienced landscape workers seldom use the orthodox lens cap when making their exposures—a much better contrivance will be found in what may be described as a square pad or pin-cushion—with this little tool an operator can deftly so shield any portion of a picture as to yield surprising results, the shape of the cushion lends itself admirably for the purpose, for it will readily be seen it can be used as a straight bar across the top of the lens, or it may be inclined diagonally to any side, according to the form of the object. A novice will find there is a great deal to learn in what to many may seem only a trivial item, viz., the removal of a cap or other cover from a lens during exposure. An experienced worker can readily be detected by the manner in which he "hinges" the cover. This action differs materially from the sudden pull off a novice invariably gives when exposing a plate, a method which always yields some amount of movement to the camera. And it is just here where the utility of modern apparatus may be questioned. During recent years there is no doubt everything has been done on the part of manufacturers to produce cameras and tripods as light as possible, until what is known as the "modern up-to-date form of camera" is as different from the good old box as chalk is unlike cheese, and this is strikingly shown also even in hand cameras, many of which are so made as to practically make them quite useless in the production of sharp negatives. Any camera that will not permit of its cap or cushion being removed without showing signs of movement, and even leaving a good margin of stability in hand, is worthless, and when, in addition, it comes to be that the exposures are made by means of shutters, then the movement is likely to be more pronounced still, for there are very few cameras that are proof against vibration when shutters are employed. Should any doubt the accuracy of this statement, let them apply the simple test of placing a tumbler of water on the top of the camera, and then carefully watch for the agitation of the water at and immediately before the moment of releasing the shutter. It takes a very substantial form of apparatus to stand this simple test. Somewhat recently the writer of these lines had occasion to discuss this question of vibration in the matter of hand camera exposures with a gentle-

man who prided himself that all his exposures were practically sharp. On closely scrutinising some two hundred and fifty quarter plate negatives, not five were found absolutely sharp, and even when his high-priced hand camera was used on a tripod, the water test at once revealed where the shortcoming lay, viz., the release of the shutter.

In the near future we are promised something like a revolution in the form of our cameras, for if all reports be true, we are likely to run from wood into metal in the manufacture of cameras. Such, in fact, may be said to be already the case, for metal cameras of surprisingly small bulk and lightness are now being produced which the makers claim are a long way ahead of the wooden form of box that has held sway for so long. This may be so, and on the face of matters there seems no reason why metal cameras should not be as rigid as wooden productions, but unless manufacturers pay more attention to rigidity in the future than they have in the past, there will always be those who will look back with pride and satisfaction to the earlier form of box, cumbersome and heavy though such may be.

A. T. Newton.

News and Notes.

Under the direction of Mr. J. G. Roberts, a photographic class has been commenced at the Northampton and County Technical School, Northampton.

At the Royal Photographic Society's Technical Meeting on Tuesday, October 22, at the New Gallery, 121, Regent-street, at 8 p.m., Mr. Wm. Taylor, of Leicester, will read a paper on "Some Lens-testing Instruments."

The Annual Exhibition of the Hackney Photographic Society will be held at Morley Hall, Triangle, Hackney, on Wednesday, Thursday, and Friday, November 6, 7, and 8. The Exhibition will include pictorial photographs by members of the Society and many well-known exhibitors, photographic apparatus by the leading firms, and electrical and X-ray apparatus. There will also be lantern and musical entertainments each evening. Tickets may be obtained from Mr. Rawlings, 406, Mare-street; Mr. Sharman, 186, Mare-street; Mr. Dadd, 192, Mare-street; members of the Society; or from the Hon. Sec., Mr. Walter Selfe, 70, Paragon-road, Hackney.

A report on the work done at the observatory of Catania in connection with the international photographic survey of the heavens is contributed by Prof. A. Riccò to the "Atti dei Lincei," x. 5. Among the difficulties to be contended against in the work, that of developing the negatives in the hot climate of Catania may be noted. Since the beginning of 1897, the total number of celestial photographs taken was 430, including 250 for the catalogue, 78 of the zone traversed by the planet Eros, 6 of the new star in Perseus, 3 of the occultation of Saturn, and 6 of lunar eclipses. In addition, the writer and Prof. Tacchini took 66 photographs on the occasion of the eclipse of May 20, 1900, in Algiers. A number of measurements, embracing 22,435 stars, have been made on the plates by Signori L. Franco and M. Massa, and reduced by Signor Mazzarella.—"Nature."

The Ameer and the Camera.—The late Ameer of Afghanistan thoroughly appreciated the results of modern scientific discovery, and introduced many European inventions into his country. In his autobiography, published last year, he refers to the difficulties encountered in inducing his people to adopt modern methods; and, as an instance of the ignorance he had to fight against, he relates an incident that occurred about the time of his visit to Rawal Pindi, across the Indian frontier, in 1885. A photographer had placed his camera in position to take Abdur Rahman's photograph, when one of the highest Court officials rushed up to the camera and placed both his hands over the lens. "Why do you do that?" the Ameer asked him. "Oh, your Royal Highness," was the reply, "you do not understand. This is one of the new-fashioned guns that this man is aiming at you." "I laughed heartily," explains Abdur Rahman, "and said, 'Oh, Rish Safed' (greybeard), 'whose heart is dark with ignorance, leave the man alone to take my photograph.' The poor man had never seen a photographic camera before, and therefore could not understand what it was, though I tried to explain it to him, but had to give it up at last." For the ignorance of his subjects the Ameer had always good-natured contempt.

Blue Electric Light.—Very extensive therapeutic effects are to be derived from the use of blue electric light, and if the favourable experiences recorded by Dr. A. V. Minine, says the "Medical Press," are confirmed by subsequent investigations, a great advance in the art of healing has been made. Dr. Minine has found that while blue light produces an anæmia in the parts exposed to it, white light causes the tissues to be filled with blood. The chief advantage claimed for blue electric light lies in its action on the vasomotor nerves. A further benefit to be secured by the use of this blue light is that it has a very marked anæsthetic effect, and Dr. Minine has employed it in the suturing of wounds instead of cocaine. Burns and scalds heal rapidly and painlessly, without any local application being necessary, under the influence of this new method of treatment. It appears that the removal of stitches can be carried out without causing any pain by utilising the action of this light. In purpuric patients it is claimed that the general condition of the patient, the appetite and the sleep, are greatly improved. If a contusion be exposed to this light, the occurrence of ecchymosis or of a hæmatoma is thereby prevented. In the history of medicine it is not unknown that the advocates of particular methods have in perfect good faith claimed more for their therapeutic measures than has afterwards been found to be the case. But if only a portion of the favourable results recorded as ensuing from the use of the blue electric light is capable of being utilised by the ordinary practitioner, the treatment of many puzzling conditions will be greatly simplified.

Navigable Balloons.—Balloon photography is interesting and exceedingly valuable for war purposes, when worked from a captive balloon. From time to time innumerable attempts have been made to construct navigable balloons, aerial machines, and flying machines, but the result up to the present has been a complete failure. For some time past a young Brazilian, Mr. Santos Dumont, has been creating much interest in Paris, and almost everywhere alse, by his attempts to gain the Deutsch prize for a navigable balloon, but, up to the present, without success. With his different machines he has met with several mishaps, and had some narrow escapes. Still he seems as intrepid and sanguine as ever, and every one must wish him success in his efforts. But, even if he succeeds in winning the prize, we very much fear that practical aerial navigation will be as far off as ever it was.

A "British Association" for South Africa.—The Cape papers report the formation at Cape Town of a "South African Association for the Advancement of Science," to work as far as possible on the lines of the British Association. In July last a meeting was held to establish a congress of engineers, when an influential committee was appointed. The proposal gradually widened until at length it was found feasible to establish a local "British Association," and a meeting for that purpose was largely attended. Sir David Gill, the Astronomer Royal at the Cape Observatory, who presided, mentioned that in November last he had attended a meeting of the council of the British Association, at which a strong desire was expressed to have a meeting of the British Association held in South Africa. He was sure he said, that in the event of such a visit the hospitality of Cape Town and Kimberley and other centres would be quite equal to the strain which would be put upon it by the visit of distinguished men of science. Of course in the existing state of political affairs it was impossible to contemplate such a matter seriously, and they must leave the fuller consideration of the matter until the country was settled and they were in a position to exercise that hospitality. But if they founded some association of the kind now indicated, the year that the British Association came to South Africa they should naturally merge their meeting in that of the British Association, and their organization would naturally facilitate matters and aid them in making a successful meeting when the British Association came there. Their primary object would be to found an association as far as it was practically possible on the lines of the British Association. The formation of the association having been decided upon by formal vote, the title was discussed, "South African" being carried by 31 votes against 19 for "African."

Tuberculosis and the X Rays.—At Gresham College, Basinghall-street, on Thursday, October 10, Dr. Symes Thompson delivered his third lecture on the tuberculosis congress. The lecture dealt especially with diagnosis and treatment by the X rays. Dr. Thompson said that when he last brought the subject before an audience at Gresham College it was a new one, and great progress had been made with it since. At the time of his last lecture illustrations of progress were only of a surgical nature, but now, not only could the position and extent of mischief be ascertained, but it had been discovered that the rays were useful in curing and arresting disease. By the process they secured greater precision and greater success. He spoke of the value of X rays during the present war, and went on to explain the way in which disease of the heart and lungs could be detected from photographs taken with the X rays. For that purpose diagrams were thrown on the screen by the lantern. Among them were some striking illustrations of enlargements of the heart and of the effect of pleurisy and other diseases on the lungs. He referred to the value of the ultra-violet or chemical rays, which, if brought to bear on the skin, had a wonderful effect in arresting disease which might exist. The apparatus for concentrating chemical rays was shown, as well as electric coils constructed for the purpose of giving off heat, which had been found to exercise an influence on disease. Although the chemical rays had been of much value in arresting disease, yet it had been demonstrated that the X rays could penetrate further and had been used both as a curative agent as well as for diagnosis. The X rays and its apparatus, consisting of a coil and a vacuum tube, which was fitted over a couch, on which the patient is laid, were then shown and explained. Dr. Thompson went on to demonstrate how diminution of movement of the organs of the body could be discovered. In such a case, he said, they might be in a position to treat the disease which was threatening. If they could only recognise the presence of disease in an earlier stage they would be far more successful than at present.

Commercial & Legal Intelligence.

We understand that the litigation, which during the last two years has taken place between the Thornton-Pickard Manufacturing Company, of Altrincham, and Mr. J. E. Thornton, is now at an end, Mr. Thornton having definitely withdrawn his proposed appeal to the House of Lords.

Billposting.—The annual dinner of the London Billposters' Protection Association (Limited) was held last Monday at the Holborn Restaurant. Mr. Walter Hill, vice-president, occupied the chair. The toast of "The

Association" was proposed by Mr. J. B. Boyle, who said that billposters had always had his sympathy, and he had often thought that they needed protection. Their business was as yet in its infancy, and as it had the whole field of science to turn to for help, it seemed to him that it had a great future before it. It had made great advances during the past twenty years, and had become one of the finest educational mediums that London possessed. The Chairman, in responding, claimed for billposters that they were performing a useful work, and doing it well. The objections made against them were that they posted immoral pictures, and other posters that were horrible and glaring in colour, and that billposting sites were sometimes erected in positions that were unsuitable and objectionable. Much of the opposition with which they had to contend was most unreasonable. From time to time a cry was raised by correspondents in the Press in favour of taxing posters, those correspondents being apparently unaware of the fact that they were already taxed to the extent of 33 per cent. of the value of all spaces on which bills were posted. He claimed for billposting that it was beneficial to the general community, and free from any real abuse.

THE Warwick Competitions.—The following is the list of awards of the Warwick competition for the current month:—£10 prize, J. Porter, photographer, Alexandra-road, Manchester, "A Child Study"; £5, C. A. Elliott, The Limes, Newbury, "Watching for Daddy"; £1, F. P. Candy, Clovelly, The Cutting, Redhill, "A Fishing Smack"; £1, J. W. Cooper, Greenway-street, Darwen, "A Morning Prayer"; £1, Miss Ethel Crossley, Francemary-road, Brockley, London, S.E., "The Terrace Steps, Haddon"; £1, W. G. Dickens, 21, Church-street, Warwick, "Stoneleigh Deer Park"; £1, E. J. H. Felce, Lea road, Northampton, "In the Triforium, Gloucester"; £1, Miss Edith Haslett, Belgravia, Belfast, "On Guard"; £1, H. Holden, Sandford-road, Moseley, Birmingham, "In Barmouth Harbour"; £1, H. E. Hopkins, St. Andrews', Southborough, Tunbridge Wells, "Cloudland"; £1, J. Johnson, St. Andrew's-street, Cambridge, "Girl Sewing"; £1, T. Johnstone, Campsfield-street, Motherwell, N.B., "Gymnastic Tableau"; £1, J. W. Lawson, Canynge-square, Clifton, Bristol, "Ilfracombe from the Pier"; £1, C. E. Lyon, Tentworth, Midhurst, "A Portrait"; £1, E. C. Pitt-Johnson, 4, Lambridge, Bath, "Castle Combe"; £1, P. Plucknett, St. John's, Warwick, "A Cottage by the River" £1, E. A. Price, Westfield-street, St. Helens, "The Gleaner"; £1, W. Shepherd, Duff-street, Macduff, N.B., "A Child Study"; £1, N. C. Sinclair, High-street, Woolwich, S.E. "Birch and Bracken"; £1, J. Speight, photographer, Rugby, "Autumn"; £1, E. H. Toovey, photographer, Royal Parade, Jersey, "Child Study"; £1, G. M. Turner, Granby-street, Leicester, "A Woodland Glade."

ALLEGED Fraud by Photographers.—On Friday, at Bakewell, Frank Wilson, otherwise Foulkes, and Thomas Sinclair McCall, were charged with obtaining the sum of £2 from Mr. Robert Rowland, landlord of the "Wheat Sheat Hotel," Baslow, by false pretences, on September 25. It appeared from the evidence that McCall was a travelling photographer, trading under the name of Sinclair. The other prisoner was in his employ, and solicited orders. According to the prosecution, the two men waited upon Mr. Rowland, and asked him to have his house photographed. He at first refused to do so, but prisoner Wilson said to him, "If you will allow us to take the house, we will put it in the Midland Railway Illustrated Directory," and added, into the Midland Guide as well. They also undertook to have the pictures shown in the Midland Railway carriages. In consequence of these representations, the prosecutor allowed the prisoners to photograph the house, and gave an order for a dozen copies, and paid them £2. He said if they had not promised to advertise his house in the railway guides and carriages, he would not have given them the order. Mr. T. H. Jeffrey, chief of the publishing and advertising department of the Midland Railway Company, deposed that prisoners were not authorised to canvass for advertisements or receive money on behalf of the Company. Both the prisoners were sworn. Wilson then stated that his real name was Samuel Foulkes. He was employed by the other prisoner, who, he asserted, had instructed him to promise advertisements in the Midland Guide and in the railway carriages. He did not know that he was making a false statement. McCall said he had never instructed Foulkes to make such promises. If he had done so, he had done it on his own responsibility. Both prisoners were committed for trial at the next Derbyshire Quarter Sessions. Two other charges of a somewhat similar character were then proceeded with.

PROFESSOR Tilden, in addressing the South Kensington Science students, remarked the other day that he was tired of hearing the exaggerated rubbish that was spoken and written about German competition and British incompetence, and it certainly would be worth people's while to remember that the whole of art, science, and invention in industry does not come from our great rival. Rather do we interchange with her, as, for instance, in the pottery industry, in which Germany has taken from England pottery-making machinery and England has taken from Germany the cheaper methods of decoration which litho-transfer processes confer. The consequence of this interchange is, according to the pottery trade journals, that now Germany, Great Britain, and the United States are all on a level in pottery making. No one exports very much to the other, each supplies its own market, and each is now looking out for fresh markets in the Colonies.

EVENING Technical Classes.—The current issue of the "London Technical Education Gazette" gives a list of the Institutions other than Evening Continuation Schools, in which evening instruction is provided in the subjects which constitute technical instruction. The list contains the names of sixty-eight institutions of a public character, of which fifty-one are directly aided from the funds of the Technical Education Board, including six which are wholly maintained by the Board. Speaking generally, the twelve Polytechnics (including the new Cass Institute at Aldgate) are by far the largest institutions. The Technical Art Schools recognised and aided by the Board, eleven in number, are supplemented by the Art Departments of the Polytechnics, and by the Schools of Arts and Crafts conducted by the Board itself, while mono-technic institutions like the Herold's Institute, which is devoted exclusively to leather tanning and dyeing, the St. Bride Foundation Institute, which provides instruction in printing and lithography, and the London County Council School of Photo-Engraving and Lithography, and such specialised institutions as the Trades Training School of the Carpenters' Company, furnish an important contribution to the provision for advanced technical instruction. Of the 68 institutions named, 23 provide instruction in mechanical engineering, 13 in electrical engineering, 33 in building construction, 13 in quantity surveying, 14 in bricklaying, 20 in joinery, ten in masonry, 12 in painting and decorating, 15 in plumbing, 9 in plastering, 9 in cabinet making, 5 in upholstery, 25 in geometry, 22 in chemistry, 21 in physics, 19 in mechanics, and 17 in botany. Art classes are conducted in 45 institutions, while woodcarving is taught in 29, art needlework in 16, bookbinding in 4, lithography in 4, and silversmiths' work in 3. With regard to the provision of instruction in commercial subjects, among the institutions named French is taught in 24, German in 22, Spanish in 10, Italian in 7, Portuguese in 2, Russian in 1, bookkeeping in 21, shorthand in 23, and typewriting in 11. In one institution, the Morley Memorial College in Waterloo Bridge-road, there is to be a class on the care and management of horses, with special reference to "first aid."

SYNDICATES in Germany, according to the report of Consul-General Francis Oppenheimer on the trade and commerce of the consular district of Frankfort-on-Main, would appear to have been carried to very considerable length. He states that there hardly remains a branch of trade the members of which have not combined for the regulation of prices or even for the regulation of the quantity of their output, which, of course, is only a means whereby syndicates endeavour to dictate their own prices. In order to exclude foreign competition the members of the syndicate undertake to strike out of their list of customers all those firms which purchase similar goods from firms not belonging to the syndicates or from foreigners. Thus, all those who do not draw their total supply from members of the syndicate find themselves boycotted, and for the purpose of boycotting two or more syndicates combine. The method of procedure is as follows:—The palm oil syndicate refuses to supply the manufacturers of soap who do not submit to the prices of the soap ring; or the wallpaper ring binds its paper mills not to sell to those manufacturers of wallpaper who deal with merchants who do not recognise the regulations of the wallpaper ring. Hence the man of business is considerably limited in the choice of his supply, and the importer, in addition to customs dues, thereby finds himself further handicapped; also the policy of maintaining high prices at home is effected by throwing the goods which find no purchaser at home on the foreign market at a low, or at whatever, price they will fetch. The result, of course, is the impossibility of fair trade and Consul-General Oppenheimer thinks the question deserves serious consideration, in the interest of fair exchange of goods, how such practices may be counterbalanced. The manufacturers of pharmaceutical preparations and dye-stuffs in Germany are reported to have expressed great disappointment at the commercial results of the year 1900. The previous year was a brilliant one, the import of raw materials having increased by 245,300 tons, the export by 69,000 tons, amounting in value to 35,000,000 marks and 32,000,000 marks respectively; the value of imported manufactured goods increased by 4,200,000 marks, and the value of exported manufactured goods to 26,200,000 marks; the number of establishments increased by 4.89 per cent., and though wages increased by 7.75 per cent., the average dividends of chemical concerns amounted to 13.52 per cent., as against 12.69 per cent. in the preceding year. But in 1900 the expense of manufacturing was much increased by the price of coal and the further increasing wages at home, while the troubles in China and the plague and famine in India considerably reduced the market. Moreover, in the chemical industry competition has become most keen, and it is reported that, owing to the great number of new pharmaceutical preparations which are incessantly brought into the market, the introduction of even the best preparations becomes a difficult matter. The medical world, Consul-General Oppenheimer states, can hardly keep pace, and "though the public may not be losing confidence, it is certainly less inclined to pay the same high prices for new patented medicines which were formerly obtained." In regard to dye-stuffs, the struggle between natural and synthetic indigo still continues; in fact, it has become the keener, as both parties are devising means for reducing the cost of production. Artificial indigo in Germany is chiefly produced by the "Badisch Soda und Anilin-Fabrik," near Mannheim. This concern has lately brought out a loan of 12,000,000 marks, with the avowed object of increasing the production of synthetic indigo, and thus reducing its cost price. This firm is now stated to be able to supply one-sixth of the world's demand, while the "Höchster Farbwerke" of Höchst-on-Main is further extending their synthetic indigo business. In the annual report of the latter firm the opinion is expressed that, though the price of natural indigo has considerably dropped of late, and though considerable success has accompanied the efforts to cheapen natural indigo dye by more systematic cultivation and a more rational preparation, in the competition natural indigo will finally succumb. It has been calculated that last year the natural and artificial products were used in equal quantities throughout Germany and Austria-Hungary. The price of both articles is now about 10 per cent. cheaper than it was last year, the price of the artificial product following but underbidding the price of the natural article, the policy of the manufacturers of artificial indigo being that its price should always remain a trifle below the price of the natural dye-stuff."—*The Pharmaceutical Journal.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
21	Camera Club	*Detail in X-ray Shadows.* F. T. Addyman, B.Sc., F.G.I.
21	Croydon Microscopical	Mr. Rudler's Third University Extension Lecture.
21	Oxford Camera Club	*Maximum Shutter Speeds for Snap-shots.* E. H. Binney.
22	Leeds Photo. Society	*The Australian Alps.* James Stirling.
22	Royal Photographic Society	*Some Lens-testing Instruments.* William Taylor.
22	Stonehouse	*Elementary Photo Optics.* S. H. Paynter.
23	Ashton-under-Lyne	*Improving Negatives and Prints.* Walter D. Welford, F.R.P.S.
23	Borough Polytechnic	*Ozotype.* Thomas Manly.
23	Croydon Camera Club	Beginners' Night: *How to make Lantern Slides by Contact Printing.* E. A. Isaac.
23	Photographic Club	*Photographing Polished Metallic Surfaces.* Charles Wallis.
24	Camera Club	*Demonstration of Working in Precious Metals.* S. B. Webber.
24	Liverpool Amateur	Open Meeting.
24	London and Provincial	Lantern Night. Slides by P. R. Salmon.
24	Richmond	*English Gothic Architecture.* Mr. Mann.
25	Borough Polytechnic	Instruction Evening: *Lantern Slide Making.* F. W. Gregg.
25	Croydon Microscopical	Photographic Conversational Meeting.
25	Plymouth	*Lantern Slide Making by Artificial Light.* W. C. Johns.
25	West London	Ordinary Meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 10.—Mr. W. Thomas in the chair.

Mr. Everitt showed a photograph of a sign post of a village inn near Munich, which had been taken with a Telephoto lens, the magnification being 11 diameters, the detail and rendering of the half tones making it an exceedingly fine specimen of telephoto work.

Mr. A. L. Henderson passed round some pieces of a German collodion paper he had bought about a year ago. On opening the packet recently every sheet was found to have deteriorated to such an extent as to render the paper useless. Mr. Henderson was confident that the reason of this lay in the fact that between the sensitive surfaces was placed a sheet of common white paper, and which had acted chemically on the emulsion. This was proved to be the cause, as, in places round the edges, where this interleaving paper had not come in contact, the emulsion was quite free from any defect. In the course of some remarks as to the packing of plates and papers, Mr. Henderson said he could not understand why makers would persist in the use of impure slips of paper for the separation of plates; and, in regard to the paper, why the sheets could not be packed face to face with nothing between, or if intervening sheets must be used, why not employ tinfoil, the use of which he had advocated over and over again as being free from any chemical action.

Mr. T. Thorne Baker gave a paper on "Printing Processes, Past and Present," and went very deeply into the history of past processes, with descriptions of some of the ways and means of producing positives, some of the formulæ quoted from "Spon's Workshop Receipts" being very amusing, sounding more like receipts from a cookery book than photographic formulæ, in which the "beating up of eggs" and the taking of "teaspoonfuls" of pyro played a prominent part.

It was the general opinion of the meeting that Mr. Baker had thoroughly succeeded in his object to draw up a summary of the means to produce positives by the aid of silver, iron, and di-chromatic salts, and there was no doubt that the collection of formulæ Mr. Baker had got together would prove most instructive and useful when published.

The meeting ended with a very hearty vote of thanks to Mr. Baker, proposed by Mr. Everitt and seconded by Mr. Henderson.

PHOTOGRAPHIC CLUB.

October 2,—Mr. H. Snowden Ward in the chair.

Mr. George E. Brown read a paper upon

Warm Tones in Lantern Slides.

The paper consisted principally of a series of notes attaching to a number of slides, and, without the latter for reference, only an imperfect account can be given. The first slide was an ordinary developed image, unaltered in any respect; and the next few slides showed various stages of uranium toning. Brown to red tones were got with equal volumes of 1 per cent. solutions of uranium nitrate and potassium ferricyanide, to which had been added 20 minims per ounce of acetic acid. Green tones were got by following the above bath, at the red stage, with ferric chloride (6 grains to the ounce of water), the image going first green and subsequently blue. The next slides were bleached with mercury, and afterwards treated respectively with limewater, potassium metabisulphite, or soda sulphite, according to the colour required. The limewater yields a purplish-brown, the metabisulphite a warm black, and the sulphite a variation on the latter. Hill-Norris dry collodion and ordinary gelatino-bromide plates were treated in this way and the results compared.

Some results by the following method were also shown. Any ordinary gelatino bromide plate is exposed under the negative, preferably in bright sunshine. The printing may take three or four days in dull weather, but when the image clearly shows through to the back of the plate it is ready. The surface may appear over-printed, but subsequent processes will reduce this. The following bath is then applied:—

A.

Hydroquinone	6 grains.
Sulphite of soda	10 ,,
Water	1 ounce.

B.

Ammonia carbonate	10 grains.
Sodium carbonate	10 ,,
Bromide of potash	3 ,,
Water	1 ounce.

Equal parts being used. The density will gradually increase in this bath, and the plate should be removed just as fogging sets in. It is fixed in weak hyposulphite until clear, and washed. Too much density in the high lights may be reduced with Farmer's reducer in considerable strength. Chloride plates also give pleasing effects. Exposure for three or four hours only is required, followed by fixing in weak hypo. These plates may be toned to various colours after fixing—bright blue by treatment with gold and ammonia sulphocyanide. Dr. Findlay, who uses this method, speaks of the results as being apparently quite permanent,

Mr. Brown also showed the results of bleaching with potassium bichromate, followed by solution of sulphuretted hydrogen; by Eder's hydroquinone developer for chloride plates, dry collodion and bromide plates being used. A process of toning with tin was also exemplified. The method is to bleach the slide in potassium bichromate and hydrochloric acid, afterwards treating the bleached image with tin chloride solution, so that the silver is more or less replaced by a tin salt. The resulting image is reduced by various reagents. The development with metol-hydroquinone gives a greenish black, while prolonged immersion in the stannous chloride alone gives a warm "lake."

A large number of slides by Mr. Brown and various contributors were shown, and a brief discussion ensued.

Plymouth Photographic Society.—The fact that the programme at the inauguration of the winter session of Plymouth Photographic Society at the Athenæum, on Friday evening, the 11th inst., was largely of an impromptu character in no way affected its success. The attendance was no less an evidence of the vitality of the Society than a compliment to the President (Mr. C. H. Dymond), who had the help of Mr. F. Johnson and Mr. W. H. Mayne, the Vice-Presidents, and of Mr. Wilfred Grist, the alert and ubiquitous Hon. Secretary, and a very ready response from those who could capably contribute to the entertainment. Mr. Dymond welcomed the company in the spacious library, and his suggestive presidential address was followed by music. For a most convincing demonstration of the efficiency of the pianola the Society was indebted to Messrs. Turner and Phillips, and the ingenious instrument was very skilfully manipulated by Mr. W. C. Johns, a member of the Society's Committee, on a Rud Ibach pianoforte of exquisite tone. The selections were varied, and the dexterity, clearness, and velocity of the execution was as marked as was the individuality of the expression. After Miss Monk had sweetly rendered a ballad, and Mr. T. W. Balhatchet had been heard to advantage in "Let me love thee," an adjournment was made to the lecture hall to enjoy a selection of members' lantern slides. Then, at the President's invitation, the company proceeded to the museum, and there light refreshments were elegantly served by Mr. and Mrs. Webster. More music followed, instrumental by the aid of the pianola, and by Mr. R. Ball, who played with marked skill and expression a violin solo, and vocal by Messrs. J. Skelton and Balhatchet, who joined in a duet. Mr. Rugg Monk gave a most amusing reading. Mr. White accompanied with much taste. All who had contributed to the delights of the evening were heartily thanked by Mr. Dymond. In the course of his address, the President remarked that photographers are witnesses of a scientific progress so continuous and wonderful that it would be rash indeed to place a limit to its possibilities. New discoveries in science would result in unexpected photographic developments and applications. With Ives, Joly, Carey Lea, and Lippmann working at polychromy, they could hope that actual and direct photography in natural colours would soon become an actual fact. Photography during the last twenty years had probably made more progress than any other science. It had rendered unsurpassed service to astronomy, to physics, to the study of the infinitely small, to the rapid and complete registration of all phenomena of light and motion, even of the wonderful rapidity of the minutest organism. Photography has revealed stars in the depths of space inaccessible to the most powerful telescopes, and has rendered invaluable aid in surgical operations. Botany and geology, too, owe a debt of gratitude to it, and there is no science that it has not benefited. On its art side also photography had made marked progress. That Society would, he hoped, encourage both the scientific and artistic. Amateur photographers are confined to no age, sex, class, or nation. They would like to number many lady members, for photography is a most satisfying and fascinating pursuit. Early next year the Society would hold an exhibition, and they hoped to make it worthy of Plymouth. Among the members he thought he could see a rapid progress in art photography. Let them believe in their work, honour it with faithful service, and be ever ready to see their faults and correct them, remembering always the words of Longfellow, at once a reproof and an inspiration, "We judge ourselves by what we feel capable of doing, while others judge us by what we have already done."

Croydon Camera Club.—Mr. Ben E. Edwards, on Wednesday, October 8, gave a demonstration to his fellow members at the weekly meeting of the above club. It included "A New Reducer," "Thomas' Twopenny

Tubes," and "Colour Toning." The first-named cannot strictly be called a novelty, as it was invented by Mr. Edwards himself a year or two ago. Broadly speaking, it is a modification of Farmer's ferridcyanide formula, substituting bromide of potash, in lesser quantity, for the usual hypo-sulphite of soda. Details in the shadows are not obliterated, as is sometimes the case with the latter, nor is it uncertain in its action. A very favourable opinion of Mr. Edwards' invention was expressed. "The Twopenny Tube," of Central London fame, we are all familiar with. In comparison, Messrs. Thomas' tubes are insignificant, but what they lack in size is compensated for in variety and portability. Given a supply of these the intelligent amateur, with a minimum of trouble, can develop, fix, and, if necessary, clear his negatives, and finally tone the resulting prints to a fine colour. Mr. Edwards' demonstration of colour toning perhaps excited the greatest amount of interest. Provided with a neat little case containing miniature bottles of stock solutions, he showed that red, blue, brown, and green tones on bromide papers and lantern slides could be readily obtained, or a combination of all the colours on one print. Some particularly pleasing results were arrived at, and the process should become popular as affording a change from the usual monochromatic rendering. The toning was considered especially useful for producing photographic picture post cards. Sprays of flowers in two or three tints surrounding a portrait in anothre tint were amongst many similar arrangements shown on sensitised post cards which had been printed on Rotograph cards.

North Middlesex Photographic Society.—October 9, Mr. A. H. Lisett in the chair.—Mr. Luck produced a photograph of an engraving taken by one incandescent gas burner, and asked for criticism. Mr. Haylett thought the finer lines would have shown up better if means had been taken to prevent stray light from entering the lens, such as a box, blackened inside, placed between the lens and engraving, and the light placed on the top or on both sides. Mr. Rawkins showed a bromide print in colours, produced by toning locally with different baths. The print, a seapiece with evening sky, was treated with a bath of ferricyanide of potass and iron for the dark blue of the sea; the ruddy sunset glow was obtained with copper, and the blue of the sky with gold. These solutions were applied with a piece of cotton wool.

FORTHCOMING EXHIBITIONS.

1901.	
October 18–Nov. 2 ...	Photographic Salon, Dudley Gallery, Egyptian Hall, London, W. Hon. Secretary, Reginald W. Craigie, Dudley Gallery.
,, 18 ,, 2 ...	Royal Photographic Society, New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.
,, 29 ,, 2 ...	Rotherham Photographic Society, Drill Hall, Rotherham. Hon. Secretary, H. C. Hemingway, Tooker road, Rotherham.
November 6–8	Hackney Photographic Society, Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.
,, 23–30	Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.
Dec. 3–7	Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.
,, 20–Mar. 1902 ...	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.
,, 24–Jan. 4, 1902	Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street Glasgow.

Patent News.

The following applications for Patents were made between September 30 and October 5, 1901:—

LENSES.—No. 19,504. "Improvements in and connected with Photographic Objectives." KARL MARTIN.

CAMERAS.—No. 19,708. "Improvements in Photographic Cameras." FREDERICK HERBERT SANDERSON.

PRINT DRIER.—No. 19,868. "An Improved Photo Print Drier." HENRY THOMAS HUTTON.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PROFESSIONAL DISCOUNTS AND OTHER MATTERS.

To the EDITORS.

GENTLEMEN,—Several interesting letters have been published recently in this Journal touching the question of professional and dealers' discounts. It might be asked, when is a photographer in position to secure professional discounts? A well-known firm of trade agents, etc., state that in order to secure professional discounts, a photographer must have a studio and practise portraiture professionally. Under these conditions, a photographer who confines his attention to landscape work, press photography, or the making of lantern slides, is not a professional, which seems absurd. It is doubtless necessary to draw the line somewhere, but the above definition seems open to question.

The correspondent who wrote under the name of "Northern Light," in your issue dated September 27, says that "the real parasites of our profession are a certain class of chemists, opticians, and others, who, in addition to dealing, are willing to do professional work—printing, enlarging, and developing for amateurs or anybody, and, because they do not do so openly, are still able to buy their material from the manufacturer." But what is to prevent any dealer doing any of those things enumerated by "Northern Light" openly, if they wish to do so? There are photographers, who are also dealers, who do enlarging, developing, printing, etc., for amateurs, and there is no secret about it. Moreover, everybody knows that several of the manufacturers and wholesale agents undertake to do all those things. They are obviously in a position to obtain their apparatus and material at the lowest possible price. Whether they call themselves professional photographers, the writer is not in a position to say. Probably they do not possess studios where portraiture is practised professionally.

"Northern Light" mentions another matter. He says, "Certain well-known photographers are sending operators to various parts of the country, and, by the aid of well-worded letters, soliciting sittings for various purposes. The people selected for this attention are usually socially the best and wealthiest in the part of the country where the operations are being conducted, such as justices of the peace, magistrates, bankers, members of county councils, etc. If this were done in the district in which the photographer exercised his craft there could be little fault to find, but such is not the case, and in some cases the ground worked is hundreds of miles away." This form of touting has been going on for a considerable time. Are not some of the firms who adopt this method, to the detriment of the local professional, members of the Professional Photographers' Association?—I am, yours, &c., J. A. R.

Cutcliffe-grove, Bedford, Oct. 5, 1901.

FREE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I beg to send you a cutting from the "Yorkshire Post," or, rather, an advertisement, which may interest you.—I am, yours, &c., A. E. L.

"Lyndhurst," St. John's, Wakefield.

YOUR CABINET PHOTOGRAPH FREE.

We will take your Photograph and present you with half a dozen highly finished Cabinet Photographs Free, if you purchase one of our New Home or Wheeler Wilson Sewing Machines, or a Wringer or Washing Machine between now and October 1, 1901.

We are doing this at great expense, solely to advertise our goods, so do not miss this opportunity to get a good Photo of yourself or any member of your family, as we cannot repeat this offer.

EAMES, THROWER, and CO.,
69, New Briggate, Opposite Dispensary, Leeds.

THE ROYAL PHOTOGRAPHIC SOCIETY EXHIBITION.

To the EDITORS.

GENTLEMEN,—You may possibly remember our talk early in the year, on a subject in which we are as one, viz., stereo transparencies, and your expressing a hope that I would send some in to the R.P.S. Exhibition. I remarked that they did not care for that class of work. Nevertheless, your words had weight, and, at great trouble, I got ready, and sent in a couple of dozen, but had no word from them, and

knew nothing until, on evening of Saturday, 29th ult., I saw 10 down in catalogue, but not on view. My letter to the hon. secretary, below, is Chapter II. They have not yet condescended to acknowledge its receipt even. I must repeat what I said to you six months ago: "They do not care for the work we admire."—I am, yours, &c., E. LLOYD.

8, Mapesbury-road, London, N.W., October 9.

(Copy.)

"Sir,—When I sent my stereo transparencies for acceptance, and paid the charge demanded, it was with the understanding that my work would be on view from the opening day, Saturday, 28th ult., and 'suitably exhibited,' as stated in second paragraph of section I. This was not the case. I took a friend in on Saturday, 28th, to see my slides. They were not on view. I took in three friends, and paid their entrance, on Thursday last, four days after the opening, still my stereos not on view! It was thus impossible for me to get any press notice. As I did not pay 5s. to have my stereos not exhibited, I must beg to have that sum refunded. I also think the 3s. for my friends should also be returned. I would rather have had the exhibit rejected.—Yours faithfully, "E. LLOYD.

"The Hon. Secretary, R.P.S. Exhibition."

To the EDITORS.

GENTLEMEN,—Notwithstanding its much improved management, as contrasted with that of previous years, the Royal Photographic Society is still apparently unprogressive.

In the advertisements of the Photographic Salon, I notice the announcement, "tea free." Surely our Society can go one better, and offer the public, say, a sandwich and a glass of beer.—I am, yours, &c., M.R.P.S.

To the EDITORS.

GENTLEMEN,—What ho! Without there! Stands Scotland where it did? Off with his head! So much for B— B— Bartlett.

But stay, let me be calm. Should not the President of the Society be electrocuted? Or, one or two members of the council, or Exhibition Committee, or the hon. sec. or treasurer, or the Postmaster-General and a few of his underlings be sent to durance vile? Have I read my last week's B. J. P. aright? Can it be, that a gentleman who has had his picture accepted and hung at the R.P.S. Exhibition, had received no notice of his good fortune, or even a catalogue, when the show had been open a whole week? Well, if this is the way the Society is managed, no wonder its members only number a paltry 900 or so. Great Scot! What next? Why, some poor unlucky contributor may not have received an intimation that he is among the 1,200 (more or less) whose pictures are not selected. Disgraceful! Terrible!! Awful to contemplate!!! And to think I once desired to become a fellow of such a society. My blood boils! My indignation rises!! Ha! ha!——A small soda, miss, please.—I am, yours, &c., BOMBASTES FURIOSO.

THE PROFESSIONAL PHOTOGRAPHERS AND THE PLATE-MAKERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—I thank "Unfettered Lance" for his capital suggestions, and hope many will carry them out. I, however, wish to see all manufacturers with whom professionals have dealings brought into line in the matter of discounts, and all professionals treated alike, under similar circumstances, which is not the case at present. Fortunately, I do not feel "fettered" in the sense in which "Unfettered Lance" has interpreted me; as my "nom-de-plume" has nothing to do with the matter under discussion.—I am, yours, &c.,

FETTERED LANCE.

TRAILL TAYLOR MEMORIAL LECTURE.

To the EDITORS.

GENTLEMEN,—From the notice in the photographic press I see the next lecture of this course is announced, and that admission will be by ticket, obtainable at the cost of 2d.

I am writing to inquire why ticket? It has been the proud boast of the committee and the hon. secretary that admission was free, and that no ticket was required. I can quite understand tickets being issued and sent to various persons as a compliment and reminder, and I really think that those who worked at the commencement for the furtherance of this memorial, and also those who gave a subscription, should be so complimented as well as other persons, if it so please the committee. Surely the object of the fund was to spread special photographic information to the greatest number of those interested.

If for any special reason a ticket has to be issued, let the uninvited public come in free, and allow tickets for the vacant seats, of which, doubtless, the committee will see a goodly number by this change of front. I beg therefore to enter my protest against this change, which is unfair to the lecturer and to the photographic public.—I am, yours, &c., ARCHER CLARKE.

REDUCING THE WHOLE OF THE SILVER IN A PLATE.

To the EDITORS.

GENTLEMEN,—In your impression of October 11, page 643, you remark that, "I accepted a challenge to prove that the whole of the silver could be reduced through a plate." I did make that statement, and I still say so, in spite of the report of the meeting of the L.P.P.A., that I had been beaten. "The anticipated lively meeting" did not take place, on account of my absence, attending at the meeting of the British Association at Glasgow. On my return I saw the result, and a more miserable attempt to disprove my statement could not have been produced; in fact, they prove my case. I had no idea that at the present day anyone could be found, knowing the merest rudiments of photography, that would gainsay the fact. Some of your readers may think the subject worth an experiment. The following might suggest itself, viz., expose a plate through the glass sufficiently long to affect the film right through, then give a full development. After, apply a solvent of metallic silver. Some years ago (about eighteen) I gave a formula by which the image developed visibly at the back first. Some of the old Thursday evening members may remember it, I will not repeat it here, and I will not be able to continue what I consider a stupid and silly subject for at least six months. I leave for Spain in a few days.—I am, yours, &c., A. L. HENDERSON.

Westmoor Hall, Brimsdown, Ponders End, Middlesex.

THE KODAK AMATEUR COMPETITION.

To the EDITORS.

GENTLEMEN,—We have pleasure in notifying you that Sir W. de W. Abney, Mr. J. Craig Annan, and Viscount Maitland, have kindly consented to act as judges in connection with our Kodak Amateur Competition. The last date of entry is November 30 next. Prospectuses can be had on application to us or to any dealer. With compliments.—We are, yours, &c., KODAK, LIMITED.

43, Clerkenwell-road, London, E.C., October 12, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. H. Ainley 426, London road, Sheffield. *Two photographs of E. Glover.*

C. Hands, 42, Kingswood-road, Brixton, S.W. *Photograph of cricket group.*

BROMIDE.—The address of the Rotary Photographic Company, is 14, New Union-street, Moorfields, E.C.

PRINTING PAPERS, &c.—P. C. SMITH asks: "1. Where can Rives' or Saxe's paper be bought? 2. What is the difference between P.O.P. white and P.O.P. mauve? 3. Who is the maker of Carbona P.O.P.? 4. Do you know of any dealer selling envelopes in which to store 5 × 4 negatives? 5. What are planiscope lenses, and what are they used for?"—In reply: 1. The former is supplied by Marion & Co., Soho-square; the latter by Otto König & Co., Cross-street, Finsbury. 2. A difference in tint only. 3. Messrs. J. J. Griffin & Sons, Sardinia-street, W.C. 4. All dealers supply them. 5. Simple lenses to lengthen or shorten the foci of ordinary lenses.

LENS QUERY.—THE MAJOR writes: "I wish to go in for high-speed focal plane work, and have two lenses at my disposal for fitting to camera. One is a Dallmeyer stigmatic, *f*·6, and the other a good cabinet portrait at *f*·4. Of course, the stigmatic is not so quick as the other, but would the cabinet portrait lens give good enough definition to warrant it being fixed in preference?"—In reply: The portrait lens will, of course, be the quicker of the two, but it will probably require stopping down in order to get the different planes in focus; then there will be little difference in the rapidity. We should certainly prefer the stigmatic ourselves, because it is rapid enough for ordinary work, when used with a focal plane shutter; also it is far less bulky than a portrait combination.

CAMERA WANTED.—CONSTANT READER writes: "Can you inform me where I can get a camera with one lens to take fifteen on cabinet plate, also adjustments to take twelve, and three midgets with four stamp-size photographs?"—In reply: Most of the large dealers supply such cameras. Fallowfields, Houghton's, and such firms supply them. They will send you lists if you write for them.

ADDRESS WANTED.—G. WALKER writes: "Please be good enough to inform me of the address of a maker of stamps for making an impression on the photo mount."—In reply: We hardly understand what you mean by "making an impression on the mount." If you mean blocking, or impressing the name, &c., Mr. O. Sichel, Berners Street, W., supplies a very neat and inexpensive press for the purpose.

BACKGROUNDS.—E. A. K. writes: "Will you kindly inform me where I can purchase canvas any length suitable for painting backgrounds on?"—In reply: It may be obtained of any linen-draper's or upholsterer's, in any length and up to seven or eight feet wide, under the name of unbleached sheeting. We think it may be had even wider than that.

CINEMATOGRAPH FILMS.—E. WEST asks: "Can you please tell me the firms that let cinematograph films on hire and buy second hand films?"—In reply: Probably those who let lanterns and slides out on hire also let out cinematograph films. We should advise you to write to the Tella Camera Company, 110, Shaftesbury-avenue, or to W. Tyler, Waterloo-road.

P.O.P. TROUBLES.—T. W. W. writes: "May I trouble you for a little information in your next issue regarding some trouble I have with glossy P.O.P. I generally order a gross at a time, and find, after a little while, it sticks together, and I find a difficulty in separating every two sheets asunder. What is the cause and remedy?"—In reply: The cause of the paper sticking together is, without doubt, that it has been exposed to damp—stored in a damp place. The remedy is obvious. You, no doubt, have seen on the envelope that encloses the paper an intimation that it must be kept dry.

MATERIAL FOR LECTURE.—"LECTURE" asks: "Could you give me any advice as to where I could gather interesting matter for the formation of a paper on photography to give to a mixed company at our Church Guild; something light and of general interest I think would suit the gathering best?"—In reply: If you are familiar with photography you should have no difficulty in getting up the lecture. If not, you will gain much for a lecture from any of the text-books. Some of the older ones, such as Hunt's "Photography," will enlighten you very much on the early history of the art. In the back volumes of the JOURNAL you may also learn much that will be useful in getting up the lecture.

STUDIO ADAPTATION.—A. B. writes: "I am thinking of converting two bedrooms into a studio, but the windows of these are on the wrong side. What I require is a side-light in the opposite direction, which would look direct into a tradesman's private house situated in the yard adjoining the premises. Can I make the required alterations providing I glaze with ground-glass?"—You can certainly do what you desire, but your neighbour has the right, if he chooses to use it, of putting up anything he likes on his premises that will stop out your light. We should recommend you to consult him, and explain that you will glaze the studio with ground-glass, or do anything else that will avoid inconvenience to him. It is always well to live peaceably with neighbours.

COPYRIGHT QUESTION.—"DERBIE" writes: "I should be much obliged if you would let me know through the medium of your valuable journal, whether a photographer has any right to dispose of a copy of my photograph without my written consent. Some eighteen months or so back, I went to a recently established so-called high-class photographer, and had a family group taken cabinet size, paying 25s. per dozen for them. It is necessary to state that I am a medical man attached to a dispensary here. I had until quite recently a colleague upon the staff, who somehow was not very successful, and whose services were dispensed with by the Committee. This man and his wife took it into their heads that I had been the cause of his dismissal, and in every possible way tried to do me all the injury they could. The woman went into this photographer's and saw this group upon the table. Ordered a copy (she asserts without any questions being asked) This copy has since been sent all over the country, to every place where my address could be obtained from old directories, and inquiries made as to my character and antecedents. The queries are put in such a manner as to lead people to imagine who have known me in the past that I have got recently into some great trouble, and am in a very unfortunate position, and have been the means of causing me a great deal of annoyance. Some of my old friends write to ask me what I have been up to, and altogether the situation is unpleasant. The photographer says he asked if my consent had been obtained, and was answered in the affirmative. But he ought to have had a written consent. Has he any right to dispose of copies? Have I not copyright in the negative? Have I right of action against either vendor or purchaser? It is hard to say which is the bigger liar of the two. I requested the photographer to get back the photo, offering to refund its value, but my application was treated with silent contempt. Apologising for troubling you at such length."—In reply: The photographer has no right to dispose of copies without the sitter's consent. That was decided in the Chancery Court in the case of Pollard *v.* The Photographic Company, some years ago. You can sue the photographer for damages, and also obtain an injunction restraining further sale of the prints. Also, we imagine, one against those who are making such an improper use of the photographs. You had better place the matter in the hands of a solicitor without further delay.

FAULTY FINDER.—S. CLEMENTS.—The reason why the negatives do not show the same subject as is seen on the finder is, that it is not adjusted accurately to the axis of the lens. It is a very common fault with finders, especially with those on cameras of the cheaper form.

CARBON PRINTING.—We are not surprised at all that you have failed to get prints on the carbon tissue, a sample of which you enclose. It is quite insoluble, and, consequently, is useless. It would be of no use to expose longer, or shorter, than you have done with it, because it is absolutely unworkable. Probably it has been kept too long, and so become spoilt.

PHOTOGRAPHING IN BELGIUM.—T. TEGGART says: "I am going to have a week's holiday in Belgium. If I take a hand camera with me shall I want any special permit to take photos in the streets there? If so, from whom must I get it?"—In reply: No permit is necessary. You can photograph without let or hindrance in Belgium. But you must not do so near any fortifications.

DRYING PRINTS QUICKLY.—T. BIDDLE writes: "Is there any process of printing (printing out) in which the prints can be dried off quickly after they are washed, as I often have to supply some in a hurry?"—In reply: Yes. Albumenised paper prints can be blotted off and dried before the fire directly they are taken from the washing water; so may be collodio-chloride prints. Either may be dried in a minute or two.

ALLEGED MISREPRESENTATION.—S. W.—Yours is by no means an isolated case. Often the purchaser of a business finds, after he has purchased it, that it is not so good as it was represented to be. But that is often the case with other than photographic businesses. Unless you can prove a fraudulent misrepresentation, we fear you will not be able to recover your money back. We do not think you have any remedy against the agent who sold the business, unless you can prove collusion with its late owner. Agents sell on the faith of the particulars supplied to them, and the purchaser is supposed to inquire into them for himself.

PHOTOGRAPHIC POST CARDS.—POST CARD writes: "Is there any process of producing photo. post cards of local views that one could undertake oneself to supply at a reasonable price to the public? I seem to have a recollection of reading of some method in THE BRITISH JOURNAL OF PHOTOGRAPHY but cannot trace anything just now, or in the YEAR BOOK; failing this can you oblige with the address of any firm undertaking the work where I could apply for terms?"—In reply: Messrs. Marion & Co., Soho-square, supply a preparation called "Panak" for printing on post cards; Messrs. J. J. Griffin & Sons, Southampton-street, W.C., supply the cards prepared ready for printing. Any of the collotype printers will print the cards for you by the collotype process.

PRINTING FROM TWO SECTIONS OF A GROUP.—"ZOLVEREIN" writes: "Will you kindly inform me what is the best way of obtaining a complete picture from two sections of a group. I have to make a 12×10 group, and only half the persons can attend at the same time. I have therefore taken one half in two long rows on about half of the 12×10 plate, and I propose to take the other in the same way, and then print them at twice on a 12×10 sheet of P.O.P., unless there is a better way, and you will kindly inform me what that better way is?"—In reply: The plan you suggest will answer very well, and will probably be the simplest way of doing the work, if care be taken that the camera is placed at the same distance away when both sections are taken, so that the background matches exactly at the junction. It will be well to mask out that portion of each negative that is not required in the complete picture.

PRINTS FOR CRITICISM.—"ASPIRANT" writes: "I send you, under separate cover, registered, two specimens of my average studio work. Two prints are on the ordinary P.O.P., and one on matt carbona. Will you kindly let me know your candid opinion of these portraits as professional work? I am very far away from anywhere, and have no opportunities of examining high class work, or of making comparisons, and would be glad to know your opinion of my work. Will you please point out faults and suggest remedies, that is, if you find them faulty?"—In reply: The portraits sent are tolerably good, but they are not what would be classed as high class here. They would be better if there were more shadow on the faces, which would give them greater rotundity. The portraits would also have been better had they been taken less full face and with less direct front light. Still, on the whole, as we have just said, the work is fairly good.

PYRO-ACETONE.—A. M. Z. writes: "(1) I shall be much obliged if you would kindly let me know if when using the pyro-acetone developer, the acetone and soda sulphite should be in certain proportions, i.e., supposing after the developer has been made up the acetone is found to be in insufficient quantity, and more has to be added, is it necessary to add sulphite also? Should it be necessary to add sulphite, as I have suggested, it would of course be necessary to have another solution of sulphite alone. (2) Do you consider pyro acetone a good developer? It does not always seem to me to act satisfactorily; but that is, probably, because I do not understand it."—In reply: (1) No, it is not necessary to add any additional acetone, when that proportion of sulphite is used. (2) Yes, it is a very good developer, and we can only attribute your finding it unsatisfactory to inexperience in its use.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The forty-first annual issue of The British Journal Photographic Almanac will be published early in December next. Its preparation is already receiving attention. This year's Almanac reached a total of 1552 pages, and the entire edition of 20,500 copies was sold out within a few weeks of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirement of its readers and supporters. Upon such lines we propose compiling the volume for 1902. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1902 will appear to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us by October 31.

The publishers asks us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

The Oxford Convention.

The splendid success of the meeting of the Photographic Convention of the United Kingdom, at Oxford, last July, was due in a very large measure to the efforts of the General Honorary Secretary and Treasurer, Mr. F. A. Bridge, than whom perhaps no one is better qualified to narrate the history of the photographic doings of a delightful and memorable week. We are pleased to announce that, thanks to Mr. Bridge, Oxford conventioners are to have an early opportunity of living their pleasant experiences over again. On Wednesday next, October 30, at eight o'clock, at the Photographic Club, Anderton's Hotel, Fleet-street, London, E.C., Mr. Bridge will give a paper (illustrated by members' slides) on "The Photographic Convention at Oxford." The Honorary Secretary of the Club, Mr. E. A. Newell, 4, Maiden-lane, London, E.C., will be pleased to forward invitation cards on receipt of stamped envelope. Visitors, especially ladies and gentlemen who are members of the Convention, will receive a hearty welcome to the meeting on the 30th inst. As a lantern lecturer Mr. Bridge has few equals in experience and

ability; and with such a congenial subject as the Oxford Convention to discourse upon and illustrate, he may be safely trusted to give his audience a first rate evening's entertainment.

* * *

Further Investigations on Nitro-cellulose. We have on previous occasions recently referred to these investigations by G. Lunge and J. Bebie, as under course of publication in the "Chemical News," and have called attention to the ignorance of the writers of Hardwich's exact work on the subject, an ignorance which is unaccountably especially shown in the instalment published in the current number of the periodical. Thus, with regard to "collodion-cotton," or "soluble nitro-cellulose . . . . hitherto no definite publication has appeared as to the properties requisite for each case, and the means by which they may be obtained; but for the first purpose (collodion) a smaller quantity of nitrogen than in the second (explosive gelatine) seems requisite." And, again, we find that Hardwich's special instructions (as exemplified in the formulæ we gave a fortnight ago) seem to be rediscovered by these writers, as will be seen in the following sentence from the instalment referred to, "Accordingly we do not think the undesirable deviations of results in nitrating cotton can be explained by the use of different materials as the starting-point; but they are more likely to be due to differences in the proportion of water, which have hitherto been overlooked and considered unimportant." It will be remembered we referred to Hardwich's having tried both paper and flax in addition to cotton-wool. The reference to different materials is as follows: "According to Nettlefold, wood-cellulose and cotton behave differently on nitration: with the same acid mixture we obtained from the former a product with 11.2 per cent. N, and 41.6 per cent. soluble matter, from the latter the highest degree of nitration and a solubility of only 8 per cent. . . . The view is held in some places that different kinds of cotton show a dissimilar behaviour among themselves, and to this is traceable the phenomenon reported that with the same acid mixtures sometimes soluble, and then again only difficultly soluble, products are obtained." The very points which are fully elucidated by Hardwich, who, however, did not make an analysis of his products as to show the nitrogen contents. Nevertheless he left nothing undone to show the cause of the varying qualities and solubility of the collodion-cottons. While dealing with this subject we may refer to some interesting properties of nitro-cellulose when exposed to extremely low temperatures. It has been shown that at temperatures of -50^0 the insoluble variety of nitro-cellulose becomes soluble in ether-alcohol, and Lieut. John B. Bernadon, in a work recently published, says that the solubility extends to their treatment with ethyl-ether, and with the exception of the highly nitrated insoluble variety, absolute alcohol also dissolves them. It is well known that neither ether nor absolute alcohol alone suffices to dissolve "soluble cotton."

* * *

The Mülhausen Awards. The Industrial Society of Mulhausen awards periodically a number of medals and premiums for essays upon a variety of technical and chemical subjects, among these, as interesting to photographers, the awards being for essays sent in before February 15 next year may be named, "A medal of honour and 800 marks (about £40) for a substance which may be used as a cheaper substitute for dry egg-albumen. Also similar rewards "for a colourless blood albumen which will not become coloured when steamed." This apparently well-known fact of the non-permanence of blood albumen, at any rate under treatment with steam, opens out a very important question. There is a common impression that in the albumenised paper of commerce blood albumen is largely used, and this question is, "Does blood albumen change spontaneously after coagulation by nitrate of silver in the same way that appears to be admitted that it does when coagulated by steam?" Any light that can be thrown on the subject of the change undergone by albumen prints by the lapse of time would be welcomed. There cannot be a doubt that prints on albumenised paper as produced during, say, the last decade, show a larger proportion of faded prints than those done at an earlier period. Many photographers put down the cause of this to the inferiority of modern mounts; but though this may be one factor, it is certainly not the only one, for we have seen collections of prints, ranging in age from 30 years to a few months, mounted in books of apparently similar paper, in which the earlier prints are actually in better condition than those ten to twenty years of age. Mounts may have a voice in the matter, but we have a strong suspicion that the chief cause is the use of much thinner negatives, which give an image that is not so well sunk into the albumen as when strong negatives, such as the old wet plates gave, were employed. In the new type of negative, quickly printed in comparison, the silver image lies near the surface; in the wet plate period the image extended below the surface, and if there is a well-authenticated fact with regard to albumenised paper prints it is that the action of the atmosphere upon them leads inevitably to fading. At the same time the possibilities of the effect of blood albumen should now always be borne in mind when discussing the causes of that fading which nowadays is so lamentably frequent in prints upon albumenised paper.

* * *

The Three-colour Process. This process is gradually forging ahead, thanks to the labours of the handful of experimentalists who have for so long been devoting their energies to a solution of the many problems by which it is hedged. Very beautiful specimens are now being executed by this process, and we may safely predict that the literature of the future will be largely illustrated by it. For large editions, especially, it presents features of economy which will commend it to publishers, and therefore we may reasonably look for its extensive employment in periodicals of the more ornate kind, before it makes any decided invasion into the book world. It might be assumed that there is a wide field for three-colour work in the production of the pictorial posters of gorgeous hues, which are now so prominent on every street hoarding. But this is not necessarily the case. The present tendency is to design these posters in broad masses of colour, and to use only two or three pigments at the most. And such a course is certainly the right one to pursue for pictures whose primary object is to arrest attention. Such colouring can be secured

with better effect, and by cheaper and simpler means, by using unetched surfaces to print from, and for this reason the older method of printing is not likely to be superseded. By the way, a curious point was raised not long ago by a lady medical practitioner, Dr. Sarah Buckley, of Chicago, anent pictorial posters. She affirmed that the various big advertisements referring to indigestion, consumption, liver troubles, nerve disorders—indeed to every ill to which human flesh is heir—act by suggestion in inducing the diseases which the remedies they laud are supposed to cure. "People," she said, "become convinced that they are afflicted with diseases when they see the remedy advertised. The process of suggestion is responsible for this, and posters are the cause of it." This theory opens out a terrible vista of possibilities, and will, in the first place, cause an immediate increase in the bill-sticking business. But surely if it be correct, the various soaps advertised should long ago have brought about an awful epidemic of personal cleanliness among the masses. We have as yet detected no evidence of this in Britain, but it may be different in America.

* * *

Fine Grain and its Relation to Colour Sensitiveness.

A very interesting article by Dr. Luppo-Cramer is published in the "Photographische Correspondenz" concerning the loss of actinism of the spectral colours at sunset. The immediate subject of discussion is rather academic, as it concerns the true interpretation of certain spectrum photographs made by the Lippmann process on the 7th May, 1892. The photograph made at 6.8 p.m. only rendered red and green distinctly, whilst one made exactly two hours earlier gave an almost perfect spectrum of a brilliant character, stretching into the ultra-violet. Krone attributes the difference to loss of actinism. Dr. Luppo-Cramer, on the other hand, thinks it is due to under exposure, and a peculiarity he has observed in the especially fine grained emulsions used for the Lippmann process, which he has found very susceptible to sensitisation for the red to green. Even without a screen the rays of lower refrangibility have their colours reproduced with greater intensity than the blue. Dr. Luppo-Cramer compares this with the capacity for colour sensitisation of the coarser grained extra rapid plates, which are of opposite character. With short exposure the Lumière panchromatic plates only render the blue-violet. The absorption band in the red does not appear till later, and its breadth increases with the exposure. From this it appears that the ideal panchromatic plate has yet to be found. It should not only be sensitive from the ultra-violet to the infra-red, but it should also be equally sensitive throughout the entire spectrum. The test in this case would have to be made with a grating.

* * *

An Imperfection of the Lippmann Process.

The fact referred to in the preceding paragraph, that the more refrangible portion of the spectrum lags behind, when the exposure is short, constitutes a drawback to the Lippmann process, so far as at present developed. In the ordinary photographic process the eye is not satisfied unless it sees an approximately correct rendering of tone, but an appreciable error in exposure with the Lippmann process gives an incorrect rendering of colour, that impresses the eye in a much more marked degree than a false rendering of tone. Dr. Luppo-Cramer thinks that the perfect colour process should be independent of the individual. So long as we select our sensitisers and colour screens, and expose for a definite purpose, the rendering of colour is dependent upon the brain of the operator. Concerning the subjective nature of colour, Schopenhauer wrote the following remarkable sentence in 1854:—"An additional proof of the subjective nature of colour, showing that it is a function of the eye, immediately belonging to it, and only secondarily and indirectly to the object is afforded by the Daguerreotype, which in a purely objective manner renders all that is visible, with the exception of colour."

* * *

Blue in the Ultra Red.

Dr. Luppo-Cramer, in the article to which we have drawn attention, refers to a peculiar phenomenon, of which he gave an account last year in the September number of the "Photographische Correspondenz." The limited number of sensitisers which had been used for the Lippmann process induced him to make experiments with chlorophyl, amongst others. The chlorophyl was freshly prepared from grass for each experiment, in the form of an alcoholic extract. It was found to be a better sensitiser for red than cyanine. A small band of blue was observed in each case beyond the red, but at the time did not excite much interest. The impossibility of determining the exact quantity of chlorophyl used, led to the substitution of other sensitisers, such as Formyl-violet, Wollschwarz 4 B, Malachite-green, and Benzyl-blue. These and other sensitisers continued to give the same band of blue beyond the red. The fact was mentioned to Dr. V. Buss, who suggested that it might be due to the action of rays of twice the wave length of the normal blue. Dr. Luppo-Cramer has named this band of colour contra-blue. He leaves the determination of the theory, that it is due to rays of twice the wave length of normal blue, to Dr. Buss, but he enumerates a number of interesting facts which appear to support the theory. For instance, when the grain of the Lippmann emulsion is coarse, the contra-blue appears with certainty, although the normal blue may be absent and the green and red very indifferent.

* * *

The Permanganate Reducer.

Professor Namias returns to this subject and states that he finds the process is gaining rapidly in favour. He recommends the use of $\frac{1}{2}$ gramme of permanganate of potash to a litre of water acidified with 5 to 10 c. c. of sulphuric acid. From more recent experience he finds that the action of this reducer is more general than that of persulphate of ammonium, which in its earlier stage only attacks the denser portions of the negative. It has also been found that by using a strong solution (10 c. c. of sulphuric acid, instead of 5 c. c.), its action upon a dried negative is much more vigorous in the high lights than in the intermediate tones, during the first few seconds of immersion. Complaints have been made that stains appear upon the negative, and as the bath of oxalic acid had been used, Professor Namias attributes them to the salt of silver remaining in the film after the metal had been converted, sulphate of silver being rather insoluble, especially when the washing water contains chlorides. The subsequent bath of oxalic acid converts the sulphate to oxalate of silver, which, being insoluble, remains in the film and turns yellow upon exposure to light. The difficulty

is overcome by using a fresh solution of bisulphite of soda instead of the oxalic acid bath. It eliminates both the dioxide of manganese, as well as the sulphate of silver. As it is difficult to get good bisulphite of soda commercially, the following solution may be used instead:—

Sulphite of soda	150 grammes.
Water.....	1 litre
Oxalic acid	30 grammes.

* * *

"The Glass of Fashion." For an idle hour there is nothing more amusing than the perusal of a set of old fashion plates. They remind us that, notwithstanding the divine precept that we should take no thought for the morrow as to our personal adornment, matters of detail in dress have always been things of the gravest moment to a large section of mankind. It is true that these fashion pictures only came into use at the beginning of the nineteenth century, but that is only because the means were lacking for their cheap multiplication. It may be presumed that Mother Eve would have started them had it not been for this difficulty, coupled with the fact that her command of textiles was so limited. These pictures, with few exceptions, have ever been remarkable for their faulty drawing, but since photography has become so common a great improvement has been effected. The camera has taught the draughtsman to be more truthful, but it has by no means superseded the brush and pencil for this class of work, and probably it never will do so. The public require that the newest things in female apparel should be depicted in a certain conventional manner. The model for these pictures must have a pretty doll-like face, a tiny waist, and impossibly small hands and feet. Moreover, every stitch of lace and other finery must be as clearly displayed as if it were stretched out on a draper's counter. Photography will not ensure these conditions, so that while it is largely employed as a useful aid, the finished pictures are executed by hand. In looking over the modern publications which make a feature of these drawings of up-to-date raiment, it will be noted what good work is put into them in spite of the afore-mentioned conventions. And this applies to the advertisement pages as well as to the editorial matter. The welcome change is, as we have just indicated, mainly due to the influence of photography.

* * *

The Use of Gelatine Plates. It would be interesting to know the value of the gelatine plates which are spoilt and thrown aside as useless in the course of a single year. Certainly, in this country alone, the amount would tot up to a very high figure, for it is only the experienced worker who can turn all the twelve plates in a box into serviceable negatives. And when we come to consider the case of the presumptuous tyro who skips in boldly where a seasoned photographer would fear to tread, the havoc in the silver-bromide must be appalling. These thoughts were suggested to us the other day by watching the photographic operations of a young lady who happened to be in the same carriage with us of the boat express from Dover. She had a hand camera, and was prompted by her companion, who evidently knew the country much better than she herself did, to take snapshot after snapshot through the carriage window, although the train, which had been delayed at Dover, was travelling at its utmost speed. "Now then," would say the companion, "get ready for Canterbury Cathedral." "No, that's not it; that's the Old Castle. There it is." In another minute, "There, that's a hop garden; I should have a shot at that, if I were you," and so on through Chatham, Rochester, etc., until, heaven be thanked, the stock of plates came to an end. It would be interesting to witness that young lady's dismay when she sees the results of her efforts to catch the fleeting scenery of Kent through a railway carriage window. Probably she will blame the plate-maker, and try another brand.

DO PATENTS RETARD PROGRESS IN PHOTOGRAPHY?

Now that so many patents are taken out, the above question often propounds itself when one reads the list relating to photography that are applied for week by week. Other queries arise in one's mind—one of them is, do the majority of patents applied for prove remunerative to those who apply for them? Another is, what becomes of so many inventions, or improvements, for which provisional protections are applied for, and granted, because a very large proportion of them are heard nothing more about, or even what they really were for beyond what was in the often very vague title given in the application? If a patent is not completed the public have no means of learning anything about the invention for which provisional protection was granted. When one reads through the weekly lists we usually see, from the titles, something in which we naturally take an interest, particularly when it is considered the number of changes that have been rung on almost every known process, and every conceivable piece of apparatus. Here is a query that often occurs to us, as it doubtless does to many others. Why are so many applications made for patents that are never completed? The application, if made by the applicant himself, always costs a sovereign, and if made through a patent agent very much more. The applicant gains nothing by it, and the invention, though there may be something original in it, brings no credit to him either in profit or reputation, as the thing is never made public. If the applicant finds, after he has obtained his protection, that his idea is unworkable, or that it has been anticipated, or has no commercial value, one would have surmised that he would have inquired into those matters before incurring an unnecessary and useless expense.

Evidently the idea of those who take out patents is to make money out of them, and no one can blame any one for profiting by his inventions when he has the opportunity of doing so. Though it is more often than not, with patents now taken in connection with photography, that they result in a loss instead of a profit.

Here is a query one is inclined to put: Are inventors, or pseudo inventors, more mercenary now than they were in the early days of the art? If one refers back to the JOURNALS of forty or fifty years ago, when the art was in its infancy, and when there was plenty of scope for real invention, we find them teeming with new and original inventions and suggested modifications, but now it would seem that any such are mostly made subject-matter for patents. If, by way,

of illustration, we take the three years 1850-1-2, which includes the year that the collodion process was invented, we find that only seven patents relating to photography were taken out in the three years, less than are often applied for in a single week now; and, what is more, that most valuable process, collodion, was not amongst them. The majority of the most valuable inventions in photography were freely given to the public, and were never trammelled by patent rights. The collodion process was not patented, nor were the collodio-bromide or the collodio-chloride processes. Gelatine dry plates and the gelatino-chloride (P.O.P.) process also were never patented. The inventors of these processes gave them free to all who liked to make use of them —commercially valuable as they were. At the present time, however, the most trivial modification of anything connected with photography seems to be patented; possibly this in a measure may be accounted for by the cheap rate at which patents for a few years may now be obtained.

It is not a little surprising to find on referring back how many of the modern inventions were anticipated, even in the very early days of the art. For example, roller slides and daylight spools were in use in the wax-paper days. The latter Captain Barr fully described in the first issue of the "Journal" of the Photographic Society of Bombay, and the description was reprinted in "Notes and Queries" in 1855. The paper was fastened to a band of black calico, which was then wound on a roller, which was placed in the camera, the other end of the calico was then attached to another roller the opposite side of the camera, and so the paper was wound from one roller to the other, being kept flat by a plate of glass. Captain Barr also had the black calico longer than the paper, so that when all was wound on the rollers there were several plies of the black calico which protected the paper from light, so that the spools could be changed in daylight. There are many instances that might be quoted where old inventions, which were published before the photographic world was really ready for them, that have since been patented, and turned to profitable account by modern "inventors," though the patents, of course, would not prove valid if they were contested in a court of law.

The question we propounded in the heading of this article is, "Does a patent retard photographic progress?" In some cases it does, and in others it does the reverse. Sometimes a thing that is really good is published by its inventor, so that any one may avail himself of it if he chooses. The description is read, and often afterwards entirely forgotten. Whereas if it were patented the owner of the patent would probably put it upon the market, and, by well advertising and "booming" it, bring it prominently before the photographic world, in which case it may not only become profitable to him, but at the same time prove a benefit to the public who, without the "booming," might not have known anything about what may be a very useful acquisition in their working. This is notably the case with some very useful apparatus we have in our minds.

On the other hand, a patent may retard progress. For example, if the patentee who holds the monopoly—for, after all, a patent is a monopoly that is acquired under certain conditions—places undue restrictions on its working, either by exacting high prices for licenses for working it, or charging an exorbitant price for the article or the materials for its working. But this is now seldom the case, as the owners of patents find it to their interests to give every facility for working under them, finding that it is better to sell the largest quantity of goods, and thus enhance the profits accruing from them. We might here mention in reference to this point that although the patents in connection with the two processes, by which the largest number of pictures now exhibiting at the Royal were produced, have long since expired, we venture to say, without fear of contradiction, that the former holders of the patents are now turning out far more material than they ever did before, thought the price of it remains unchanged, notwithstanding the lapse of the patents.

MEASURING THE INTENSITY OF LIGHT.

I SHREWDLY suspect that the writer of the article upon the "Measurement of Diaphragms," in the issue of this JOURNAL for September 27 last, has been amusing himself by penning a series of ingenious paradoxes, without serious intention behind them; but lest he may be taken in earnest by some readers it may be worth while to take the paper seriously and show where real error exists.

Leaving aside his prefatory remarks, we first meet with the difficulty regarding the expression—or use of it—"square," viz., that two metres square and two square metres not being the same thing, the system of nomenclature is wrong through two different expressions for units being employed. Such is not the case. Two metres square is a popular expression only, and is a colloquial shortening understood by most, representing some such expression as a "square of two metre sides."

Next we have, "I cannot believe that the following law is correct: 'The quantity of light falling on a given surface varies inversely as the squares of the distance from the source.' First because calculations by this law are lost in error on the slightest departure from certain prescribed conditions in approaching infinity. For example, suppose a so-called 'point' of light be 1 cm. from a surface which has an area of one square metre. We see a spot of illuminated surface close around the light, and a swift approach to shadow all around the edges of that illumination."

This last assertion is assuredly incorrect. To begin with, it would be utterly impossible to have a surface of one metre exposed to a point of light one centimetre from it under the given conditions of the law that he apparently quotes. Mr. Steadman depicts what would happen truly enough with a plane surface, but then the edges of that metre plane would not be the same distance from the point as would be the centre of that plane. The only conditions that would satisfy the law he enunciates would be when the interior of a spherical surface was exposed to a light emanating from the centre of the sphere.

We are further asked whether, "if a surface having an area of one square centimetre be illuminated by a light surface of one square metre at a distance of 1 cm., and that surface be moved to a distance of 2 cm., it is true that the light value or the illumination of the small area would be only a quarter of what it was when the light was 1 cm. distant?"

This query deserves very close attention, for it promulgates afresh an error which has been made by writers of eminence. It is not the case that such proportions of received light would exist. The error originates from supposing that the converse of the law first stated by Mr. Steadman is true. It is correct to say that a surface illuminated by a point of light situated at equal distances from any portion of that surface is illuminated by an intensity proportional to the squares of the distances; but. it is not true that, granted the illumination of such a surface, the light received from it at any point is proportional to the squares of the distance between point and nearest part of surface.

The true law that governs such receipt of light is as will follow, and is well worth remembering, for, to the best of my belief, no one but myself has ever published it.

It is useful to know, as so many calculations of light received by

sitters from a window have been given on the assumption that the illumination of the sitter will vary, as the squares of the distances of the sitter from that window.

The following may be given as a rough statement of the law. Taking any one point of surface upon the sitter, the light there received will vary as the squares of twice the sine of half the angle of light as received on that point. When small angles are involved it will be seen that the light received is almost inversely proportional to the distance, and not to the squares of the distance.

The rule thus enunciated is applicable of course to Mr. Steadman's other example of a cylinder, with regard to which he says, "Now, according to the accepted law, if this cylinder be enlarged in diameter it must admit light from . . . . $\frac{12}{16}$ of all space." In a further example he shows that the "accepted law" would make the enlarged cylinder admit $\frac{48}{16}$ of all space, which, in the language of Euclid as presented to us in school books, "is absurd."

It can, of course, only be observed here that there are accepted authorities and accepted authorities. The shining lights of pictorial photography are not necessarily to be accepted as authorities in scientific questions.

Briefly, Mr. Steadman's paradoxes are founded first on the error of treating a point of light as radiating on to a plane surface in close proximity, and secondly, in accepting the dicta of those who assume the converse of the law of the squares and distances to be correct.

G. Watmough Webster, F.C.S., F.R.P.S.

THE PRESENT POSITION OF PROFESSIONAL PHOTOGRAPHY.

[Abstract of an address delivered at the opening of the Polytechnic Photographic School.]

On the occasion of our opening night it is permissible to depart some what from our regular educational duties, and consider subjects which, although they do not come under this heading, have nevertheless a real educational value, and are equally near to our hearts and interests. And, further, the custom we have adopted in so many previous years of asking some special authority to address you on some special branch of photography has this to be said against it that whatever branch is taken, there are so many divisions and sub-divisions of photography in actual trade practice that the subject chosen can only interest or possess any special interest for a small proportion of those attending a gathering such as this, which represents probably every section of the trade. Now the subject brought forward for your consideration to-night is one which not only has a special interest for all, but in the case of the majority of photographers intimately concerns their welfare. Some little time back (about this time last year) considerable excitement arose over the action of one or two big advertising firms, who became at once a danger to the trade, by extensively advertising that they would supply copies of photographs at nominal rates, they receiving their return in the advertisement of their wares, so that any one could go to a clever photographer, pay him only for one or two copies, and then have these copied by the said firms, at wholesale prices. Without going into the details of this business, as it is probably well known to the majority of those present, it will not be unprofitable to call attention to some points in connection with it in a manner perhaps more prominently than has yet been done. First, to the causes which led up to this action of these firms, and some changes in the business procedure of photographers which may or should ensue from this kind of competition, and (2) to the recent formation of the Professional Photographers' Association for united protection against this system of trading.

Although the subject is divided into these two divisions they are in fact the same—the one being the cause, and the other the first effect so far as photographers are concerned. First, then, as to the cause. The immediate cause is, as I have said, the action of one or two big advertising firms; but let us go a little deeper and look the true cause, or several causes if they exist, in the face. Immediately this is done we are confronted with this very obvious fact—that the firms referred to are pre-eminent examples of what may be termed pushfulness in business methods—that is they carry out to the full the modern principle—do not wait for, but create business, and we at once recognise in their action in supplying these cheap photographs, not a wilful intent to injure us, but the desire to create a demand for their wares. Twenty years ago a good practical knowledge and skilful workmanship were considered sufficient to insure success in photography, as in other crafts, but changing conditions and increasing competition has altered this, and we have to accept or adapt ourselves to the newer conditions of business. Look around and see how numberless are the methods employed to create demand; look especially at the publishing trade, which in a sense is akin to photography. Look only at one section of our trade, the manufacturing section, how by their system of giving prizes for work done with their plates or their cameras, they utilise to the full the spirit of emulation and rivalry for increasing the sale of their goods, and in looking at these various stimulants note how uniformly they are successful. The full recognition of this principle—the recognition that it is not sufficient to be able to supply goods or take photographs, but that nowadays you must also create or stimulate the demand for them, should turn the threatened injury to our business into an object lesson of the highest educational and practical value. We all know how frequently it happens that the clever craftsman is a poor business man—in our line—a clever operator is often a poor touter. In many instances photographers are such simply out of love for the work, and this, although a great incentive to good work is sometimes apt to become a danger to business, and it is but natural that this should be the case. We also know how many of the best photographic firms have been founded and run by men having very little, if any, skill as photographers.

Take the case of a photographer in a small town or suburb of, say, 10,000 inhabitants, who feels he wants to wake things up a bit. Let him go round personally to all the business houses and announce he is going to publish an illustrated pamphlet to advertise their Christmas goods. He will take probably 20 or more small photographs illustrating special goods, new premises, building estates, or the new church, or anything of general interest in the neighbourhood, not forgetting one or two portraits. He will send the photographs to the nearest process firm and get half-tone blocks. He will write short descriptive notes giving a distinctly local colour to his production, and developing matters of local interest. And, finally, he will publish and deliver in every home a neat little picture pamphlet that any business man might be proud of. The net result to himself will be that he has come out of his shell, and become personally known to the heads of every business house in the town, he has also advertised himself in every home in the town, and probably has a surplus in hand, and the knowledge that he can publish regular pamphlets monthly with increasing popularity and profits both directly and indirectly to himself. Every photographer should be a publisher in his own town, either by himself or in conjunction with the local printer or stationer. It may occur to some one that in many cases it would not be practical to be absent from the studio in case of sitters requiring attention. To overcome this difficulty the suggestion might be made to employ a lady operator at certain hours during the week as a special attraction in connection with ladies and very young children, excepting the few photographers whose names are as familiar as household words in connection with children and some others who are also specially gifted in this direction, it is a question whether women are not very much better adapted for photographing young children than men. Both mothers and children are not half so nervous with a woman as with a man; the youngster probably thinks the strange man is a doctor, or wonders what he is there for, and what he is going to do, and in consequence is not so natural. If the child cries the man is quite helpless, and if he touches the darling probably creases the frock or something of the sort. Now ladies instinctively understand these things and know exactly how to set things right. In the case of the photographer feeling he is not adapted to this search for business, he should at once recognise that he has only half the qualifications for success, and should associate himself with a partner or assistant having the business abilities which he lacks.

Having now pointed out one cause of this action of these big firms is that they recognise the importance of continually making fresh efforts to create business, let us turn to another, and that is the extreme ease with which these copies are produced. It is not likely these reproductions would be supplied if they required really skilful craftsmen for their production, and this points to a danger to professional photography which has been threatening for a long time past. During the last twelve years, from a variety of causes, but chiefly from the enormous demand created by amateurs, there has been a gradual simplification of the processes and operations involved in making reproductions by photography, until at the present time practically no skill whatever is required, and this threatens to produce a feeling that the photographer is not a skilled craftsman, and both the dignity and

public estimation of him as a worker are in danger of being lowered. This lowering of his status as a craftsman, so to speak, constitutes a danger compared to which the injury done by advertising cheap copying is utterly negligible. The universal respect and admiration which is justly accorded to a painter-artist is very largely due to the fact that every one recognises, and is conscious, that he or she is quite incapable of such work, and if every Tom, Dick, and Harry could, or thought they could, by buying a few brushes and colours, produce equal results the reputation of the artist would be very different. Now this is just the danger which is being run by photographers.

The remedy for this very real danger is the obvious one of utilising every simplification of process, not to save work, but to raise the standard of it, and this not only by combining with the aid of greater skill and higher knowledge, perfect gradation in our prints, with the bloom of a mezzotint, and with tones of the value of Vandyke brown, but also by the exercise of talents which only come with long training, those of good taste and artistic arrangements. One or two suggestions may be given in this direction: the first is the employment of photogravure as a method of printing, and the second is the encouragement of a taste for colour. Now that platinotypes and bromides are so generally recognised and accepted for portraiture, there is no difficulty in training young women to colour them by hand both tastefully and quickly, and at the same time the work is raised above the scope of the amateur and the cheap advertiser. "The important element of time." Year in and year out the attention of photographers has been directed here at the Polytechnic to the fearful injury to and paralysis of business which results from the inability to deliver photographs, except after long delays. A lady ordered photographs from a West-End firm, and more than a year elapsed before they were delivered. A friend of mine and his wife were photographed last March, and the proofs came promptly, but the finished prints have not yet been delivered. These are, of course, very exceptional cases, but even in a well-managed business the prints are rarely delivered under three weeks, especially in the winter-time. Why does not some enterprising trade printer open an establishment in the South of France or some other place where there is plenty of light, and arrange for the daily transportation of negatives and return of prints by the express Continental mails? Why do not photographers guarantee to deliver in 24 hours, if bromides are accepted, there being no reason why these should not be as good as platinotypes, and they are at least as permanent as any other silver prints. If you can give your customers new photographs quickly they are not likely to have old ones copied, for you may take it that except in special cases their friends do not want a portrait of the dead past, ten years or even two years back—but a living, graceful, and characteristic representation of him or her as they appear to-day. Take, again, the biograph. A man goes down to Dover or elsewhere in the middle of the day, takes thousands of negatives on a long spool, develops and finishes these negatives, prints, develops, and finishes transparencies from them, and shows them to an audience at the Palace Theatre the same evening. Is not this a practical demonstration of business promptitude of the highest educational value to photographers, and does it not seem that something must be amiss with a system which takes three weeks or more to supply a dozen prints from one negative.

Perhaps some one here will mentally hold up their hands in horror and say, "What about art, and the higher cultivation of the ideal in portraiture?" If there is any one who thinks this, the answer is, "Don't hurry your operator; don't let him have any connection with your mechanical or other time-saving appliances. Let him have everything he wants, and as much time with each sitter as he wants. Let him live in an atmosphere of the ideal, but directly he has made his exposure there is nothing you can do to improve or finish his work that cannot be done in a few hours." In connection with this question of time, we have arranged a demonstration of proofs at the time of sitting. It consists simply in taking a negative (a portrait) with the electric light, and obtaining from the developed and fixed, but undried, negative, a bromide print or bromide opal with the aid of a copying camera. Now please observe, although it may be very useful sometimes to know you have a pleasing portrait of your client before he or she leaves the premises, it does not seem a very valuable process this of getting proof a few minutes after the exposure has been made, but the reason for giving the demonstration is this: if any photographer starts making proofs in this way it will lead him to fully recognise the commercial value of promptness, and once this is realised he will not be satisfied with showing rough proofs, and will work out a system for delivering finished copies. In case it may be supposed there would be an insuperable difficulty in the retouching, it may be answered that there are half a dozen methods of avoiding retouching, and in any case it can be done in a few hours.

We now come to the last point we have to consider under our first section, that of the copyright. It certainly does seem very unjust that when a person has paid only a few shillings for what is really a valuable portrait, and the good qualities of which are the result of long experience and the exercise of natural talent on the part of the photographer, that the buyer can send the portrait to any one he pleases to be copied. The only suggestion I can put forward on this point is the one that we should try the experiment of taking the negatives and supplying proofs to householders and their families free, thereby, presumably, retaining the copyright, or, if disinclined for this, why not try the same system as the soap and cigarette firms, and make a private arrangement with the local furniture emporium to supply a photo of baby to any one who buys a bassinette at his establishment. Having pointed out five different factors:—(1) The modern business practice of creating demand by any legitimate means; (2) the ease with which photographic reproductions can be made; (3) the delays which occur in the photographer's present system of working; (4) the exploitation of the demand for inexpensive photography, which has hitherto been overlooked or insufficiently recognised by photographers themselves; (5) the non-retention of the copyright by the photographer, all of which factors have in greater or less degree assisted any one caring to increase their business at the expense of the photographer. And having also shown that in some measure the remedy for this state of things is in the hands of the individual worker, we next come to the irresistible powers and influence either for good or evil possessed by a unanimous union or association of workers for their collective action. It is the power of an organized army as compared with that of spasmodic and unsupported individual efforts. The formation of the Professional Photographers' Association has been the immediate effect of the threatened injury to their business. An Association which already numbers in its ranks the heads of 500 business houses or firms. We have here copies of the rules and aims of the Association, and we shall be glad to give them to any one who will ask for a copy. Briefly, its objects are the protection of professional photographers from unfair competition and the uplifting of their status and dignity as professional men. It is, in fact, in conception, a trades union of photographers in the highest sense of the term, and as such should command the support, not only the passive support, but the active support of every photographer. The records of trade progress, especially trades involving skilled craftsmanship, are full of examples of the power of these associations, and that this power is proportional to the unanimity with which they are supported. It becomes therefore not only a sentiment, but the duty of every photographer to assist by his personal interest and membership this unanimity of action.

And not only should we as photographers come forward, not one here and there, but all of us, and apply for membership for the sake of our mutual interests, but we have the further duty to perform in recognising by our actions the immense services which have been rendered by the pioneers of the Association, who have by their efforts made it as it stands to-day an assured success. I believe you will agree there is no one to whom photographers are more indebted, and no one who should have a greater hold on their professional admiration, affection, and gratitude than our Chairman, Mr. Thomas Bedding, and those who have been connected with him in founding the P.P. Association. Let me add that I believe we shall have the hearty support and concurrence of the hundreds of our professional students in making a new departure by asking Mr. Bedding if he will honour us by becoming the President of our School for the ensuing year.

In conclusion, there is one suggestion which I should like to make if we can do so without offence, and that is that steps should be taken to make the Association, in the full sense of the term, what its name implies, that is the Professional Photographers' Association. At present it is, correctly speaking, the P.P. Masters' Association, and excludes all except employers and those in business for themselves. Surely this should now be remedied. There can be no present reason for this limitation. Look around at other similar organizations—the goldsmiths, the doctors, the lawyers, the architects, the chemists, the coach-builders, the plumbers, the painters, and dozens of others. At starting, it was a splendid line to insure the support of the masters, for without their hearty concurrence nothing could be done, but now they have come forward in such strength to form the backbone of the Association, its portals should be opened wide, and comprise the whole of the profession.

E. Howard Farmer.

B

MOTIVE AND METHOD IN PICTORIAL PHOTOGRAPHY.

[Abstract of President's Address to the Edinburgh Photographic Society.]

In the history of our art there is no aspect of it so remarkable as the extraordinary progress and popularity of what is, for want of a better phrase, termed pictorial photography. Sooner or later the majority of the great army of photographers, save those who have an inclination for special phases of the scientific or technical side, are attracted to the pictorial aspect. Within the last ten years exhibitions have become the order of the day. Increase in the numbers who pursue an art does not necessarily imply real progress or advancement of aim. Taking the average exhibition, we may find several hundred productions covering the walls, but to say what proportion of these may legitimately be included within the category of successful pictorial effect is an altogether different matter. It may be a bold statement, but there is little doubt that perhaps less than a tenth of the work which is sent to the average photographic exhibition can truly be termed pictorial. In looking over the pictures in most exhibitions the candid critic who has the welfare and progress of pictorial art at heart, must confess to a feeling of disappointment and sometimes of disillusionment as to the possibilities of our art as a means of pictorial representation. Pictures are shown with poetical titles, nicely composed according to what are termed the laws of composition, executed with the highest technical skill, tastefully mounted and suitably framed, and yet they awaken no sentiment of delight or pleasure in the mind of the beholder, such as a real work of art ever does; they are good photographs but nothing more. Others again captivate us by their charm; we feel a real pleasure in beholding them; we go back to them with increasing pleasure; we feel in a modified degree, but none the less feel, somewhat of that pleasing sensation with which we look at and admire a great work of art. Why, then, should there be these different feelings created in the beholder of works which, judged by purely photographic standards, may be of equal excellence? The explanation is to be found in the fact that the latter bear the stamp of motive and personality, while the others might be produced by any one who is skilful at photography. What has been termed the "fatal facility," with which we may expose and produce photographic prints, is responsible for much of this slovenly work which is sought to be termed pictorial. The best of us are at times afflicted with this fever to produce, and we too often only realise our weakness and our errors when we see our productions hanging alongside of others with the stamp of pictorial on them as clearly as if they were labelled. The importance of motive, or emphasis of idea, has been borne in on me in a most forcible fashion while looking over some of my own productions which have been lying aside for a time. In trying to recall the motives which prompted me to portray the effects I had done, in vain did I ransack my memory for definite ideas or purpose. My one wonder is now that time, energy, and skill were ever exercised in the production of prints so stale and unprofitable from the pictorial point of view. It cannot be too strongly emphasised that the first essential feature in a picture is that it should be interesting. The late H. P. Robinson, who did so much in his time for the advancement of our art on the pictorial side, once said: "The one intolerable defect in modern art is its dulness." If this can be said of art generally, how aptly it applies to photography. It is true, within recent years, many photographers have tried, and a few succeeded, in breaking down the barriers of sameness. Others have imitated the successful men, and the result has been too often pure imitation or eccentricity. This will always be a danger in photography—it is so easy to imitate. If we want to be successful then in our pictorial attempts, our productions must exemplify some idea, tell some story, fascinate by their grace, charm, and expression. The question arises, how are we to train our minds and our eyes to be able to select suitable subjects into which we may infuse motive and the personal touch of individuality? It may be questioned whether, in our pursuit of the pictorial, we take advantage of the opportunities which an intimate study of nature will afford in stimulating our imaginations and suggesting ideas for pictures. It has been said that "art must anchor in nature, or it is the sport and breath of every folly." So far so true, but the photographer, mostly with a meagre art training, is apt to be led into pitfalls, unless he is an intimate student and lover of nature. "Nature never cares whether she has a sky or a foreground: the photographer should take care that the bit of her he selects has both." The more we know of nature the better we shall be enabled to interpret her, not slavishly, but taking her at her best—watching and waiting for the subtle effects she sometimes, without effort or design, spreads out for the observing and discriminating photographer to make use of, and to fashion into a picture which he may justly claim as his own. Many photographers who become imbued with the desire to make pictures miss much of the pleasure and most of the suggestiveness which a close study of nature invariably gives. They set forth with their cameras bent on securing something that will tell at the next exhibition. As they pursue their quest their view meter or the camera is ever and again set up, and they pass on to something else if the subject does not conform to the laws of composition or their notions of lighting. The beauty that meets them in their path is passed by without appreciation, the wayside flowers, the graceful trees, the twittering birds in the woodland glade, the ever-changing panorama of clouds scudding across the sky, the subtle light glancing ever here and there, throwing objects into shadow and relief with ever-varying charm—all this is as nothing to them if it provide not subjects for their camera. They are like Wordsworth's "Peter Bell"—

> "The primrose by the river's brim,
> A yellow primrose was to him,
> And it was nothing more."

We would improve our pictures both as to motive and treatment much more if we were to leave our camera oftener at home and set forth in quest of suggestion, stimulus, to say nothing of enjoyment, with only a view finder. A day spent like this occasionally is fruitful in suggestion, and with mental and written notes made will provide ample material even in a limited and often apparently unpicturesque district. All great landscape artists have been close students of nature, and if it is essential for the painter to know nature well, how much more so is it for the photographer, who, with his limited medium of pictorial expression, ought to know and love nature so well that he will always be careful to interpret her in her best and most inspiriting moods. Constable tells us that it was his associations with nature in boyhood that made him an artist. In speaking of the district now known as the Constable country, and in which he found the material for most of his landscapes, he writes:—

"I associate my careless boyhood with all that lies on the banks of the Stour. These scenes made me a painter, and I am grateful. The beauty of the surrounding scenery, its gentle declivities, its luxuriant meadow flats sprinkled with flocks and herds, its well-cultivated uplands, its woods and rivers, with numerous scattered villages and churches, farms and picturesque cottages, all impart to this particular spot an amenity and elegance hardly anywhere else to be found."

Method in pictorial effect is almost, if not equally important with motive. If we be not careful we may, through lack of knowledge, carelessness of treatment, or other reasons, introduce some disturbing element which may minimise, if not altogether destroy, the motive of our picture. Of the means at our disposal two most important points in the success of a picture are selection and suppression. Selection of the best point of view and lighting to give justice to the motive inspiring our effort. Of these selection is the easiest, and it is to the photographer what arrangement and composition are to the painter. Too often in our photographic work our subjects select themselves; this, however, is the fault of the photographer. A knowledge of the laws of composition is of essential value in selection. There are accepted laws in the composition of a picture which should be carefully attended to, with a view of placing our principal object to the best advantage for effect. These rules the photographer need not allow to shackle him, but a knowledge of them is essential, otherwise he would be groping in the dark as to what would and would not make a picture. Suppression is a much more difficult quality to obtain, essential though it be; for without suppression he will often have distracting elements which may mar an otherwise excellent picture. How to obtain this is a matter of personal taste; the wise use of the lens, working at the largest aperture possible which will allow the lens to cover the plate sharply to the corners. Focussing on the principal object, even putting the whole picture slightly out of focus is permissible, so long as form is not destroyed. This is a most important point, many photographers imagining that so long as detail is suppressed form is of little or no moment. Perhaps the most important means of suppression, however, and one which always lends an additional charm to a picture, is atmospheric effect. It is difficult to analyse and say why atmospheric effect is almost always charming in itself. There is no difficulty in a humid climate such as ours of frequently obtaining the aid of atmospheric effect to give charm and mystery to our pictures. Many unpromising subjects may under the soft veil which atmospheric effect throws around harsh outlines and obtrusive details give us pictures well worth waiting for. The charm of atmosphere is little understood by many photographers. They call it fog, and do all in their power to get clear sparkling pictures. In this

respect I recall an observation which I overheard while looking over a recent exhibition. One exhibitor was taking a friend round who evidently, from his comments, was a skilful photographer so far as technique went. His comments were pointed enough regarding the purely mechanical side of the exhibition, but when his friend asked his opinion of the show, he replied, "It is a very good one, but, man, the pictures are awfu' misty." The beauty of atmospheric effect was quite lost on this individual. In nature atmosphere is always present, sometimes in a greater or lesser degree, but always present. It is this quality which is so invariably absent from the view produced with f-64, or a smaller stop, and which in the early days of landscape photography gave critics an opportunity to deride the idea of our art being capable of producing anything pictorial. We are learning slowly, and as isochromatic plates and a judicious use of the yellow screen become better known and appreciated for the truer rendering of colour values, the stigma may be removed altogether. Tone is an important factor in successful pictorial effect. "It is," says Ruskin, "often confounded with what is usually termed 'aerial perspective.' Tone is the exact relief and relation of objects against and to each other in substance and darkness, as they are nearer and more distant, and the perfect relation of the shades of all of them to the chief light of the picture, whether that be sky, water, or anything else." It is impossible for our art, or any art, to render the same range of tones as nature. Still it may be questioned if we have many of us yet realised the capabilities of the photographic plate, properly used, in rendering tone or colour values. Of the importance of the matter there can be no question. In a recent number of the "Amateur Photographer" an eminent art critic alludes to the question of values as follows:—"There is one matter that should receive the utmost attention in artistic photography, especially as it seems to present extraordinary difficulty through the conditions of production. This is a matter of 'values.' They are very elusive, and though the graphic artist can study them and record them from nature, he often finds it necessary to number them in order to ensure correctness. The photographer, developing his negative away from nature, is at a disadvantage in this respect. I therefore venture to offer him a little piece of advice, and with this I will conclude. Let him carefully note his highest light and his deepest shadow, as well as all such intermediate tones as are important, numbering them according to their degrees of intensity. This may be done on a rough sketch, or even by a written memorandum. It will be of the greatest assistance in completing the picture, for the 'values' of nature can never be guessed."

In the application of our methods let us try to forget sometimes that we are using photography to gain a pictorial result. Too often our anxiety to produce a good photograph leads us to forget some points in our picture. By this do not understand me to advocate slip-shod methods of working. But is it not the case that too often we allow the conventional idea of what is the correct thing in printing, or texture, or something else, to lead us away from the substance—which is the production of a picture—in quest of the shadow, which after all, is only the means we should employ and subordinate to our own purposes. Let us change the method we have of criticising and analysing our pictures to death. Why should we concern ourselves as to the plate, exposure, process, or locality? It is sufficient to produce a picture—never mind the means. If it conveys no message to us, if it tells no story, gives us no pleasure, condemn it or pass by, but leave questions of process and other matters of technique out of consideration altogether.

JAMES BURNS.

RADIOGRAPHIC WORK.

[Reprinted from the "Pharmaceutical Journal."]

THE time has now arrived, I think, when it is possible to assay the true value of X-rays to surgery. Hitherto, although I have always answered the numerous inquiries on the different points received from both medical men and chemists, I have felt that there was too much popular magazine exaggeration on the one hand, and perhaps too much depreciation on the other, to render any account of laboratory experience advisable.

The inquiries which have reached me may be grouped as follows:—(1) The best methods of working suitable for hospital and general practice; (2) the extent of present knowledge; (3) the reason of, and prevention of, harm to the patient; (4) the income to be derived from X-ray practice; (5) the relations between surgeon and radiographer.

Before considering these in detail it would be as well to state what good skiagraphs, or, as I prefer to call them, electrographs, should be; they should represent without distortion the exact position of foreign bodies, fractures, injuries, or growths; they should not be mere shadows, but, in spite of the opinion lately expressed by a London hospital expert, should be true photographs, showing the grain and texture of all bones near the plate, and the form of those, such as the ribs and pelvis, which cannot be placed in contact. They should specially portray the exact thing wished by the surgeon at the expense of all other parts—e.g., ulcer on the bone, the exposure should be timed to give the extent of the ulcer, not prolonged to give a good image of the bone.

(1) Although my experiments date from the day after the publication of Prof. Röntgen's paper, and have been continued to the present time, almost without a break, and although I have taken some thousands of electrographs, I do not pretend to say that other apparatus, in other hands, is not capable of giving as good results. All I can say is that I have bought, tried, and discarded most of them. The apparatus I use at present is a 14-inch spark Ruhmkorff coil of English make, a lithanode accumulator, and a home-made Wehnelt break; the mechanical break worked from the accumulator for softer tissues, the Wehnelt direct from the mains through a resistance for bones and the thick parts of the body. The plates, the slowest I can get, and thickly coated; developer, quinol, strongly restrained with bromide. The advantage of the Wehnelt is the reduction in exposure, which rarely exceeds thirty seconds. There is no general rule for exposure; so many things enter into the equation. Should there be much suffusion it must be prolonged, if the patient is very anæmic it may be shortened; highly nervous people, especially women, require less than phlegmatic ones, and so on. A good rule when uncertain is to view through the body on the screen.

(2) At present it is possible to locate all foreign bodies, steel, glass, etc., to electrograph all fractures and dislocations, to prove in some cases stone in the bladder or kidneys; but a negative result does not prove the absence of stone. Many exaggerated opinions have been expressed on this subject. A calcareous deposit may show, one of uric acid will seldom do so. I do not think it is possible to infallibly show aneurism of heart or disease of lungs; it may be shown occasionally, but at present it is uncertain. For old, stiff joints, where the patient has been unable to move them for months, an exposure of thirty seconds, at intervals of three days, with a lead plate under the patient, has in several cases proved curative. This branch of usefulness is little known, and, I think, very promising.

(3) The reason of burns and harm to patients, several of which have been referred to me, is generally the ignorance—I may say the culpable ignorance—of the operator. To avoid it the rays should never be used at all where there is acute inflammation. The exposure with a mechanical break should not exceed thirty minutes; with a Wehnelt, four to five minutes at a time. The tubes should never be nearer to the plate than twenty-two inches, and these exposures should be reduced to two-thirds when passing the rays through the abdomen. The hair, when near the tube, should be covered with thick lead foil.

(4) Fortunately for the future of the science, it is quite impossible for a conscientious operator to make the practice of X-rays lucrative. The rapid deterioration of plant, the continuous expense entailed by experiments, and the comparatively small number of cases in any district preclude this; but against this, as a pursuit it offers endless opportunity for original work and discovery.

(5) I have heard of friction between surgeon and radiographer, although personally I have met nothing but the greatest consideration and kindness from all the surgeons I have worked with. In every case, I think, such friction arises from a misunderstanding. Radiography is a new pursuit. It requires a man who is first and last an electrician, a scientific man, accustomed to weigh the value of physical experiments, and possessing an entirely different attitude of mind to that of a medical man. He can make electrographs; if he attempts to translate them he is a quack. He possesses neither the training nor the mental acumen acquired by the surgeon during long and arduous study. It is as absurd for the radiographer to offer an opinion on one of his electrographs as it would be for the surgeon to dictate to him what voltage he should use. Of course, no case should be undertaken except by direction of the medical attendant. The two pursuits are distinctly apart, each worker going on parallel lines, mutually helping each other to attain the two greatest of all human ideals—the lessening of human suffering, the advance of human knowledge.

S. HENRY SMITH.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Scarborough.

A meeting of the Scarborough photographers was held at the Savings Bank, Scarborough, on Friday, October 18, Mr. S. W. Fisher, J.P. (Sarony and Co.), presiding. There were also present Messrs. Boxell, Cromack, Smith, Taylor, Watkin, and others. Letters expressing sympathy with the object of the meeting were received from Messrs. W. D. Brigham and H. Hare. After some discussion it was resolved to support the newly formed Professional Photographers' Association, and a resolution was unanimously passed approving the action of the Association in regard to trade discounts.

Seventh List of Members of the Association.

The following gentlemen were elected members of the Association at the meeting of the Committee on Friday, October 18:—

Bell, Joseph (Brown, Barnes, and Bell), 31, Bold-street, Liverpool.
Browning, John R., 11, Bedford-circus, Exeter.
Cooper, Edward Charles (Mitchell and Cooper), 49 Spring-bank, Hull.
Downey, William (W. and D. Downey), 61, Ebury-street, Pimlico, S.W.
Fisher, Samuel Waind (Sarony and Co.), Sarony-square, Scarborough.
Hancock, W., 293, Holderness-road, Hull.
Hartley, Joseph (Hartley Bros.), 2, South-road, Waterloo, Liverpool.
Hartley, Thos. (Hartley Bros), 2, South-road, Waterloo, Liverpool.
Kevis, Walter, Petworth, Sussex.
Lubosky, Nahum E., 20, Yeoman's-row, Brompton-road.
Morris, Robert William, Cathedral Studio, Chester.
Payne, Samuel Glendinning, 43, High-street, Aylesbury.
Shares, John Waite, Promenade, Bridlington.
Spratley, John Edward, 18, Rock-lane, West Rockferry, Cheshire.
Stewart, Robert, Elgin.
Thompson, George Edward, Kingston Studio, 220 Holderness-road, Hull.
Werner, Alfred (Werner and Son), 38-39, Grafton-street, Dublin.

ANNUAL MEETING OF THE PHOTOGRAPHIC COPYRIGHT UNION.

[Official Report.]

The annual general meeting of the members of the Photographic Copyright Union was held on Tuesday, October 15, at the Imperial Restaurant, Regent-street, W. The chair was taken at 8 p.m. by Mr. Frank Bishop (President), supported by the Vice-President, Mr. Joseph J. Elliott, Mr. Bulmer Howell (solicitor of the Union), and Messrs. W. E. Downey, A. Ellis, W. Grove, and J. Lillie Mitchell. Amongst other members present were noticed such well-known members of the profession as Messrs. William Downey, Mr. Lyd Sawyer, Mr. Bedford Lemere, Mr. H. N. King, etc.

The President commenced the proceedings with his address, as follows:—In the report now presented you will find that this Society is now in the eighth year of its existence, and it may not be uninteresting to say a few words how and why the Union was started. Before the perfection obtained in half-tone process blocks, illustrations were largely made from engraved wood blocks, and it was quite customary for many of the leading photographers to supply illustrated journals with their photographs for reproduction, without charge, provided their name and address was printed beneath, and it answered their purpose to do so, for the public, seeing the wood block, and knowing they could get original prints from the photographer, which they much preferred, it created a considerable demand for the prints which the photographer supplied; but when the half-tone process blocks came to such a state of perfection, and were largely used by all the illustrated papers, and in other illustrated matters, they were in reality rivals to the photographer's photographs and damaged his sale. The photographer could not stop the success of the half-tone blocks, but he had the right to charge for the reproduction of his copyright photographs. It was found extremely difficult to carry this out effectually by individual action, hence the formation of the Copyright Union, which, in the face of great difficulties, has succeeded in making the rights of photographers in their copyrights respected. Photographers had not only to meet opposition, but to formulate, by many meetings, rules for their guidance, and for the establishment of a reasonable fee for the right of reproduction. He remembered at the first very extravagant ideas were put forward as to the minimum fee. Some suggested two guineas for the right to reproduce a view, but this was considered excessive, and the minimum of 10s. 6d. was eventually established. Of course there was great opposition on the part of users of photographic reproductions, but the 10s. 6d. minimum has been found reasonable, and is now generally accepted. In some cases, such as Frank Sutcliffe's "Boys Looking Over Bridge," and some animal studies by Charles Reed, of Wishaw, and a great many other famous productions, it would be a folly to allow the reproduction for 10s. 6d.

The movement for the protection of photographers' rights in this respect had not been peculiar to our own country, but similar societies on the same lines as ours followed both in France and America.

Not only has this operated in favour of the members of the Union, but it has benefited all photographers, whether members or not, and it makes it much easier for them to obtain a remuneration for their photographs; and I would remind photographers that it is very much to their interests to support the Union. Perhaps the biggest work done by the Union has been that of influencing the prospective copyright legislation in the Bills of the late Lord Herschell, and the two later Bills of Lord Monkswell. Meetings for many months at Mr. John Murray's, meetings at the Royal Photographic Society, meetings on behalf of photographers before the Select Committees of the House of Lords, for the different Bills introduced, and certainly the last Bill, in my opinion, is a very great improvement on the other Bills previously introduced; but even in this one there are some points that require alteration. As stated in our report, we shall keep a vigilant watch on copyright legislation when brought forward before Parliament. I mention these few facts that our friends in the north may not fear that we have not been vigilant in the past, and that we shall not be equally vigilant in the future.

I understand that one of the cases that was successfully carried out in court is going to be appealed against. Our committee will fight this appeal, and, if necessary, carry it to a higher court. It is sometimes thought that the committee work solely for the interests of photographers in London. Such is not the case. We may say that this very case which we have to meet on appeal is for a member in a far distant colony. The second case that we carried in court successfully was in the interest of a photographer in a small provincial town in Essex.

Your committee also do not lose sight of aiding to the best of their power any legislation that might be proposed for the uniformity of copyright in the Dominion of Canada, Australasia, South Africa, and other portions of the empire. At present the law is apparently different in each colony, and in a perfect chaos. I think this is a very important subject, and will become each year of greater importance. It does seem very unfair that whilst any colonial photographer can get his photographs easily registered and protected in England, the English photographer finds it extremely difficult to get any like protection in any of the colonies. What is really required is a universal copyright law for England and the whole of the colonies. I do not consider it right on the part of the English Government to grant protection here to any foreign nation, or to any of the colonies, unless reciprocal rights are accorded to Englishmen.

Respecting the new Association of Professional Photographers, the Copyright Union have every sympathy with any movement for raising the status of the profession. It has been stated that there is a certain jealousy on the part of the Union against this Association. I can assure the Photographers' Association that this does not exist, but that our sympathies are entirely with them in any action they may take for the benefit of the profession. The Photographic Copyright Union is purely for the protection of photographic copyright, but it is in no way antagonistic to any other society that works for the prosperity of photographers.

The addition to Rule 19, as mentioned in the Committee's report, having been proposed, seconded, and carried unanimously,

The Committee's report was read and adopted.

Mr. J. Lillie Mitchell (Hon. Secretary) spoke as to the charge for the use of photographs for cigarette stiffeners, etc., in large quantities, and reproductions from cinematograph films. Some discussion took place on these subjects, in which the opinion seemed to be that photographers would be well advised not to allow their photographs to be reproduced by bromide process for such purposes as cigarette stiffeners, etc. It was ultimately decided that this was a question that could not be legislated for at that meeting, but had better be left for the Committee to consider.

The Treasurer's report, duly audited, was laid on the table.

The auditors, Mr. Thomas Bedding and Mr. Lyd Sawyer, were thanked for their services, and were unanimously re-elected for the current year.

Mr. Warwick Brooks and Mr. W. Magrath were re-elected to the committee.

Votes of thanks to the Solicitors of the Union, the photographic press, and the President and Committee of the Union, brought the proceedings to a close.

EDWARDS' AND NELSON'S IMPROVED PROCESS OF DRYING PHOTOGRAPHIC PLATES, FILMS AND PAPERS.

[Patent No. 14,625 of 1900.]

The patentees say: The object to be attained by this invention is the drying of photographic plates, films, and papers, in a better manner than hitherto, and so that the surface of the plates, etc., shall not become decomposed or damaged by moisture or heat during the

process of drying. We attain this object by removing the moisture from the air in the room or chamber in which the plates, etc., are dried, by means of pipes into which ammonia is allowed to expand, or by means of pipes containing cold brine or glycerine, or any other suitable medium which may be employed for refrigeration as is generally understood, in combination with any convenient method of heating the air in the said room or chamber, such as hot water pipes, or steam pipes. In the usual methods of drying photographic plates, etc., the air is heated so as to take up the moisture from the plates, etc., to be dried, and is then carried off from the room or chamber in which the drying is done, and fresh air introduced to replace the air charged with the moisture from the plates, etc. In our improved process the hot water pipes, or their equivalent, heat the air, which takes up the moisture from the plates to be dried, and then deposits that moisture in the form of frost or snow on the surfaces of the refrigerating pipes, thus leaving the air dry, and fit to again circulate over the surfaces of the plates, etc., to be dried, and so on. It will be seen that by this improved method of utilising both heating and refrigerating pipes in the same room or chamber, it becomes unnecessary to introduce fresh air, as the processes of taking up moisture from the surfaces to be dried, and depositing such moisture in the form of frost or snow upon the surfaces of the refrigerating pipes, and again taking up the moisture from the plates, etc., are automatically continued so long as there be any moisture to be taken up, and this is of enormous benefit in the drying of photographic plates, films, and papers, as the room may be practically hermetically sealed; and therefore the difficulty of introducing fresh air without at the same time allowing dust to enter, is avoided. It will also be seen that the room or chamber in which photographic plates, etc., are dried by this improved method may be kept at any desired temperature by adjusting the proportionate activity of the heating or refrigerating pipes, without affecting or reducing the efficiency of the process of drying.

News and Notes.

THE Austin-Edwards Monthly Film Negative Competition.—The Prize Camera for the current month has been awarded to Mr. Clifford W. Thomas, Ryecroft, Crosshills, near Keighley, for his negative "Street Scene in Stromness."

PHOTOGRAPHIC Convention of the United Kingdom.—There will be a meeting of the Council at Anderton's Hotel, Fleet-street, London, E.C., on Wednesday, October 30, 1901, at six o'clock. Agenda:—To receive the balance sheets of the Oxford meeting; to fill two vacancies on the Council; to elect an honorary secretary; general business.

THE California Camera Club announces that in conjunction with the San Francisco Art Association, the Second San Francisco Photographic Salon will be held in the galleries of the Mark Hopkins Institute of Art in the City of San Francisco, beginning January 9, 1902, and continuing two weeks. The pictures will be selected by a competent committee of artists and photographers appointed by the San Francisco Art Association and the California Camera Club. Exhibitors of pictures which have been hung in other salons and exhibitions are specially invited to contribute.

IN our review of the work of professional photographers at the New Gallery Exhibition, we inadvertently omitted to notice the tasteful display of Miss Lena Connell, of 3, Blenheim-place, St. John's-wood, N.W. Miss Connell, like most lady photographers, seems to devote herself principally to the portraiture of ladies and children, and in these subjects, the natural feminine daintiness and the less likelihood of constraint on the part of the sitters in the hands of a lady, are advantages that our fair sisters enjoy, and make the most of, in their competition with mere man.

AN exhibition of a novel and interesting character will be held by the School Board for London at the Examination Hall, Victoria Embankment, W.C. (adjoining Waterloo Bridge), on Thursday, Friday, Saturday and Monday, the 31st October, 1st, 2nd, and 4th November, 1901. It will consist of scientific apparatus which has been constructed by pupils and teachers for the purpose of teaching and illustrating some of the branches of experimental science. Amongst the exhibits will be found induction coils, telegraph instruments, motors, voltameters, galvanometers, etc., used in the teaching of magnetism and electricity, Boyle's tubes, balances, etc., for chemistry, lantern and microscopic slides for botany and physiology, and many others for use in mechanics, sound light and heat, mensuration, mechanical drawing, etc. There will also be shown dissections in a preservative spirit of such things as a skate's ear, sheep's kidney, rabbit's lung, etc., for the teaching of physiology. The exhibits, it is expected, will number altogether about 200, and amongst them will be seen many which have been constructed from apparently waste materials. The Board, in holding an exhibition of this character, have in view the possibility, that, by encouraging the construction of apparatus by pupils and teachers, it may be possible to reduce their present heavy accounts for scientific apparatus, and also that at the same time it may be the means of familiarising the pupils more fully with the working of apparatus made by themselves than with apparatus which is obtained from the makers. Not only will apparatus which has been constructed by pupils be of very great use in teaching, but the act of making the apparatus will be of itself one of the very best forms of education, as many of the exhibits require that very careful and accurate measurements should be made in order that the apparatus should be workable. The teaching of the construction of simple pieces of apparatus to be used for scientific purposes has been recently initiated by the Board, and they have arranged for pupils who are taking courses of practical science to attend at some of the wood-work centres for this purpose; but the innovation is of too recent a date for any results to be forthcoming. It is hoped, however, at future exhibitions of the Board's work, of which the science apparatus will form a section, that many useful pieces of apparatus will be shown, and it is felt that in the future an exhibition of this kind will be an absolute necessity in order that the large army of pupils and teachers from the different schools of the Board scattered all over London may see in one central building what is being done in schools other than their own. It is also anticipated that the pupils and teachers, by seeing the exhibits, will be able for future exhibitions, to either improve the present apparatus or devise new apparatus, and, possibly, for different subjects. Not the least of the expectations is that the sight of apparatus of a cheap and home-made character will be the means of encouraging the study of practical science at home, which, hitherto, has not been possible, on account of the prohibitive cost of the necessary apparatus. It is of course to be expected that the exhibits will be of rather rough construction, but their merits or demerits will be judged by their originality and simplicity of design, and accuracy and clearness, rather than by their refinement of finish. Although the majority of the exhibits will be of a technical or scientific character, there will be shown many which should prove of interest to the ordinary visitor, and, inasmuch as the admission is entirely free, it is hoped that the ratepayers of London will take this opportunity of seeing the really ingenious specimens exhibited at this exhibition.

Commercial & Legal Intelligence.

SOME pleasing specimens of Christmas Card mounts for photographs have been received from Messrs. H. and W. Green, the Crown Photo Works, Rotherham. They are supplied gold and silver bevelled; with blocked mottoes; fancy folding; slip in, etc.

THE Metric System.—Mr. W. H. Holland, M.P., has presented a report of the committee on the metric system to the Association of Chambers of Commerce. The committee have unanimously adopted the following resolutions:—"(1) That, after considering various suggestions, this committee is unanimously of opinion that the Chambers should unite in urging upon the Government the compulsory adoption of the metrical system of weights and measures, leaving matters of detail to be considered later. (2) That the committee is unanimously of opinion that a British decimal system of coinage must be on the basis of retaining the sovereign, with the florin as a unit, divided into a hundred cents or farthings. (3) The committee recommends that there should be nickel coins of five and ten cents, and bronze coins of one, two, and four cents or farthings."

A SECRET Photo Process.—At the Lord Mayor's Court, last week, an action was brought by Sprague and Co., Limited, 4, East Riding-street, against Messrs. Johnson, Riddle, and Couchman, printers, 22, Southwark Bridge-road, to recover the sum of £5 10s. Mr. Norman Craig, plaintiffs' counsel, said the plaintiffs owned a secret process by which designs were transferred by a photographic process on to stone. In July the defendants asked the plaintiffs for an estimate to supply a transfer of a drawing of some buildings in Broad-street-place. The work had been done, and the charge was £5 10s. The defendants objected to pay because they maintained that it was a breach of a trade custom for them to supply it to one Martin, for whom the defendants had been working. It appeared that the defendants had been working for Martin, who was dissatisfied with their work, and had rejected it. Martin came to the plaintiffs direct. The defendants' manager told the court that the plaintiffs' work ought not to have been so thick and heavy. The learned Judge said he could not go into trade customs. That was only a matter of honour. The work was good enough, and there must be judgment for the plaintiffs.

AT the Derbyshire Quarter Sessions, on Thursday last, Frank Wilson alias Samuel Foulks, aged 30, and Tom Sinclair McCall, aged 26, photographers, were charged with fraudulently obtaining £2 from Robert Rowland at Baslow on September 25, and further with fraudulently obtaining 12s. from George Ollivant, at Bakewell, on September 24. The case for the prosecution was that the prisoners went to people and obtained cash for photographs, which they agreed to supply, and also to publish in what they called "The Midland Railway Guide." Mr. Ollivant, a publican, said prisoners went to his house, which they photographed, and subsequently he paid them 12s., on the understanding that the photograph would appear in the "Guide." Mr. Rowland, landlord of a public-house at Bakewell, said he paid the prisoners £2 on condition that photographs of his house appeared in the "Guide," and also in the Midland Railway carriages, and the prisoners agreed to do that for him. The prisoners did not actually say they were agents for the Midland Railway Company, but they led him to infer that they were. Evidence was given by an official in the employ of the Midland Railway Company that the

prisoners were not authorised by the company to promise the insertion of advertisements in any of the company's books or carriages. The prisoners went into the box, and denied that they had any intention of fraud, but they were found guilty and sentenced to three months' hard labour each.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
28	Camera Club	*Carbon Working.* Messrs. Elliott Bros.
28	Croydon Microscopical	Mr. Rudler's Fourth University Extension Lecture.
29	Birmingham Photo. Society	Annual Meeting.
29	Stonehouse	*Artistic Christmas Cards.* Mr. Walling.
30	Borough Polytechnic	*Westminster Abbey: its Architectural Beauties and Historic Associations.* E. W. Harvey Piper.
30	Croydon Camera Club	*Home-made Apparatus.* J. Noaks.
30	Photographic Club	*The Convention at Oxford.* F. A. Bridge.
31	Camera Club	*Two Years' Motor Car Progress.* J. H. Knight.
31	Liverpool Amateur	Lantern Lecture: *The Queen of English Rivers.* Dr. J. W. Ellis.
31	London and Provincial	Demonstration of the "Kammatograph."
31	Richmond	*Ozotype.* T. Manly.
31	Rodley, Farsley, and District	Lantern Lecture: *Old Churches.* S Margerison.
November.		
1	Borough Polytechnic	Instruction Evening: *Enlarging.* P. C. Cornford.
1	Croydon Microscopical	Trial Night for Lantern Slides.
1	Leicester Literary	*A Gossip on Flower and Tree Photography.* J. Porritt.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 17.—Mr. H. J. Froggatt in the chair.

Mr. R. Beckett brought before the notice of the meeting a rather curious instance in connection with an enlarging lantern. The light employed was an electric arc lamp, and which acts perfectly with fairly strong negatives. However, the light being found to be too powerful for some certain negatives, a piece of yellow glass was introduced between the light and the condenser, and the resulting enlargements were found to be perfect in every detail; but this yellow screen rather prolonged the exposure, so a piece of ordinary ground glass was substituted. The image thrown on the screen was visually perfectly sharp, but on development, the enlargement was found to be far from sharp, and, in fact, considerably blurred. Mr. Beckett's point was, why a piece of perfectly-ground glass, such as that used, should upset the chemical rays?

Mr. Child Bayley remarked that even if the ground glass were optically worked, and perfectly flat, he would expect the illumination to be bad, as, by the introduction of a piece of ground glass between the condenser and the light, the point of light, which is so essential in enlarging, would no longer be a point, as the cone of light, immediately it reached the ground glass, would be broadened by the diffusion caused by the ground glass, and so very effectively damage the definition.

Other members were of the same opinion as Mr. Child Bayley, and Mr. Grant suggested that the correct position of the ground glass would be in direct contact with the negative.

Mr. Beckett thought that the only other theory that might be suggested was, that the objective used might be wanting in colour correction, and, if so, this result might be expected.

Mr. Henderson said he had received a communication from an American firm, who required a set of about twenty-five stereoscopic negatives of the forthcoming Coronation ceremonies, and who were willing to pay a fair price for them. Mr. Henderson would be pleased to send full particulars to any photographer who would care to undertake the commission.

Mr. Drage, speaking of a German illustrated journal he had shown at a meeting a few weeks ago, said he had received several complaints from English journals as to his remarks that this particular journal was superior to anything turned out here, and Mr. Drage wished it to be made clear that he was drawing the comparison from our journals of like value, the price of this German one being 20 pf., or a little over 2d., this fact being omitted at the time of the report.

Mr. A. L. Henderson made an offer to the Association of a gift of £5, to be given each year by this Association to a member of this or any other society, or to any person connected with photography, for the best paper on anything new, or advancements in the chemistry of photography, the judges to be drawn from members of the London and Provincial Photographic Association.

This offer of Mr. Henderson's generosity led to numerous suggestions and propositions, but in the end it was proposed by Mr. Child Bayley, and seconded by Mr. S. H. Fry, that Mr. Henderson's offer of a sum of five pounds, to be awarded by the London and Provincial, annually, for the best communication on the subject of photographic chemistry made during the year, be gratefully accepted, and also, that the name of Mr. Henderson be permanently associated with the Society in making this award.

This proposition was put to the meeting and carried unanimously.

PHOTOGRAPHIC CLUB.

OCTOBER 9.—Mr. J. R. Gotz in the chair.

Mr. W. R. Stretton showed some transparencies bearing upon the subject of altering the colours of images by subsequent treatment. Ordinary gelatino-bromide plates, developed and fixed, had been intensified with mercury, and subsequently treated with hypo-sulphite solution. They showed what colours the treatment made possible, but only in the direction of dark browns; whereas, at a previous meeting, Mr. Mason spoke of reddish browns by similar treatment. Mr. Stretton further showed some plates in which a second treatment had produced a decidedly warm sepia, and another with a vermilion image that he had been unable to repeat. Some irregularities in the colouring he attributed to unequal action of the mercury, on the supposition that where a heavy deposit of silver occurred, the gelatine was rendered less absorbent of the mercury salt which produced the red colouring.

The Chairman said he had got the same red tone on paper of the "Velox" type, but only once. He suggested that some developers were more prone than others to give these colours.

Mr. F. A. Bridge spoke of some negatives that had been treated with Edwards' intensifier. They were of the usual canary yellow colour, but he found that careful printing gave prints that were not to be excelled by those done before the negative turned to the yellow colour. In enlarging, too, there was no reason to doubt that they would give fine prints, although they presented a very thin appearance. He did not object to the yellowness at all.

Mr. Stretton said that they gave enlargements that were superior to those obtainable from the unaltered image, but, if deemed necessary, the negatives could be re-blackened.

A short discussion took place regarding the exhibitions at the New and Dudley Galleries.

Croydon Camera Club.—There was a well attended and representative assembly on Wednesday, 16th inst., when Mr. W. H. Smith gave a series of demonstrations to his fellow members of various elementary operations in the working of glass by means of the ordinary gas flame and the blow pipe flame. In the practice of experimental photography there are frequently arising circumstances when some small glass attachments are called for. The simpler forms of some of the above were shown and made by Mr. Smith. The bending and joining of tubing, the making of thistle-headed funnels, and of tee pipes, etc., were demonstrated. In the course of various experiments, the singular property of "reduced" lead igniting with brilliant flashes and sparks on exposure to air was shown by means of decomposing tartrate of lead in a glass tube, which, being sealed up, preserved the reduced lead from air. On breaking the tube end and shaking out the lead it deflagrates. Another striking experiment was made with a gas tourniquet, made by Mr. Smith, of glass tubing. On connecting it with the gas supply four small arms were lit, and the contrivance was made to spin round at a great rate by means of the pressure of the gas escaping from the pin-hole orifices of each arm. Amongst the practical uses of glass working were shown several ingenious arrangements whereby small quantities of solutions can be quickly and accurately drawn off from bottles without tipping or uncorking. The oxydising action which is apt to ensue where stoppers are removed whenever any part of a solution is required is by the above expedient obviated. It was suggested by Mr. Mees that to still further reduce the oxydisation a thin layer of paraffin oil should be poured on to the surface of solutions.

West Surrey Photographic Society.—Mr. R. Baskett gave a demonstration last week at the West Surrey (Clapham Junction) Rooms, on a mechanical as against a chemical reduction of excessive density in a negative. Pointing out the uncertainty of the latter mode, he said it seemed more reasonable that as the error to be mended was principally on the surface of the gelatine film, a sufficient wearing away of that surface should be the true remedy, and a mechanical should be the true method. He had made many experiments, and knowing how gelatine refused to allow even so penetrating a thing as varnish to enter its bulk, he tried that first as a vehicle; that proving tacky and troublesome, he added oil, and finally, left out the varnish. In the result he found as perfect a means of reducing as he could wish for in a mixture composed of two ounces of salad oil, two ounces of terebene, and a twopenny tin of Globe polish. The whole well mingled, and then strained carefully once or twice through fine muslin, and bottled. It was cheap, easy to prepare, and effective. To use, pour a little on the negative, and then, with a pad of fine cotton-wool, rub the surface with an even pressure all over if for general reduction, using a smaller pad and more pressure to effect local reduction. When reduced enough, all that remains to do is to clear off any surplus oil, etc., with clean wool, and then, with a pad moistened with benzine, gently rub the surface. The result should be a clear, lustrous, and nearly waterproof negative. Mr. Baskett said that the printing powers of all negatives would be improved by a slight cleaning by this process, there being a slight scum surface, due to the natural action of gelatines and glues when drying, and which contained whatever impurities the maker had been unable to stop out. He mentioned that it was a good polish for lenses, but required great care. The demonstration was most successful and interesting, the members who had brought up negatives for the purposes of the evening, reducing them straight away. The effect on a negative is so very brilliant that it is difficult to tell the front from the back.

Woolwich Photographic Society.—On the 10th this society held its ninth annual meeting, when a most satisfactory state of affairs was revealed. It may be within recollection that most of the members are engaged in the Royal Arsenal, and that through war pressure, the society

had to break its sequence of exhibitions, and abandon that for 1900. The executive, however, rose to the occasion, and during the past year carried out the programme in its entirety, held a most successful exhibition, a dinner, a social evening, inaugurated a library, and closed the year with a wholesome balance. Mr. Charles Churchill, F.R.P.S., was re-elected President, together with the following officers:—Vice-Presidents, Messrs. W. H. Dawson, J. Desforges, J. B. Panting, F.R.P.S. Council, Messrs. Douglas English, B.A., S. Hughesdon, A. E. Harris, W. Slater, F.R.P.S., G. Tapp, and A. J. Wing. Hon. Secretary, W. H. Nichols, 30, Heavitree-road, Plumstead. Hon. Assistant Secretary, H G. Weekes, 6, Delafield-road, Charlton.

Liverpool Amateur Photographic Society.—At the last weekly meeting a discussion took place on "Direct versus Enlarged Negatives." The debate was opened by the president (Dr. Ll. Morgan), who spoke in favour of large direct negatives. Mr. Appleby, Mr. Anyon, Dr. Ellis, and Messrs. Inston, Schierwater, Parkinson, and Simnet all took the part of the enlarged negative. Dr. Morgan, in closing the discussion, admitted he was in a minority of one, but he hoped that other members would try large direct prints.

FORTHCOMING EXHIBITIONS.

1901.

October 25–Nov. 2 ... Photographic Salon, Dudley Gallery, Egyptian Hall, London, W. Hon. Secretary, Reginald W. Craigie, Dudley Gallery.

,, 25 ,, 2 ... Royal Photographic Society, New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.

,, 29 ,, 2 ... Rotherham Photographic Society, Drill Hall, Rotherham. Hon. Secretary, H. C. Hemingway, Tooker-road, Rotherham.

November 6–8 ..... Hackney Photographic Society, Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.

,, 23–30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.

Dec. 3–7 ..... Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.

,, 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

,, 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.

Patent News.

THE following applications for Patents were made between October 7 and October 12, 1901:—

FLASH-LIGHT CARTRIDGE.—No. 20,117. "An Improved Flash-light Cartridge for Photographic and other purposes." G. KREBS.

PRINTING BY ARTIFICIAL LIGHT.—No. 20,164. "Improvements in Printing Photographs by Artificial Light." WALLIS ASKHAM.

PANORAMIC CAMERAS.—No. 20,173. "Improvements in Panoramic Photographic Apparatus." (Communicated by Auguste Lumière and Louis Lumière.) BENJAMIN JOSEPH BARNARD MILLS.

SHUTTERS.—No. 20,388. "Improvements in Exposing Apparatus, more particularly for Cinematographic Photographs." (Communicated by W. Elsner and Paul Latta.) Complete specification. HERBERT JOHN HADDAN.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITORS.

GENTLEMEN,—There is one striking distinction between the Royal Photographic Society's Exhibition, now being held at the New Gallery, Regent-street, and the Photographic Salon at the Dudley Gallery, viz., the absence of awards at the latter show. This distinction has probably impressed itself more forcibly this year on the attention of visitors. The judging of several hundred photographic exhibits can be no light task, and however competent the jury, differences of opinion among exhibitors and visitors concerning the merits of medalled works in comparison with certain others which have found a place on the Exhibition walls are inevitable. The task of the judges is not an enviable one; and for some reasons, one cannot but admire the policy of the Salon authorities in this respect: the members of the Hanging Committee constitute the sole jury, and there are no awards beyond the acceptance or rejection of the works for exhibition. And good workers are content to exhibit an these lines. Whether the suggested abolition of the awarding of medals at the older show will commend itself to the majority of the exhibitors and would-be exhibitors it would be difficult to say without a canvass. There is a good deal to be said against the awarding of medals, although it might be desirable to continue the custom in respect of the technical exhibits. The abolition of medals in respect of the pictorial exhibits, and their rentention in respect of those in the technical section, would probably tend to attract more attention to the latter. Interesting as the exhibits in the technical section are, some scheme should be formulated to make them more numerous. The fact that they are shown in the gallery prevents many of the visitors giving them attention. It is difficult to say where else they could be conveniently exhibited under the circumstances.

It is rather curious that some of the medalled pictorial exhibits are not reproduced in the catalogue. Whatever may be the reason for this, it allows other attractive and notable work to be thus honoured; and it will be generally agreed that a judicious selection has been made, of which one at least might have been awarded higher honours. Those who are unable to visit the Exhibition might, with advantage, purchase a copy of the catalogue. Besides the twenty-four notable pictorial exhibits reproduced in half-tone, it contains an excellent photogravure from a photograph of the President (Mr. Thomas R. Dallmeyer, F.R.A.S.) Mr. Hugh Fisher's little sketches appear as usual. Some would prefer that the number of these were increased rather than diminished, as some, it seems, consider desirable.

One notable feature worth mentioning is the fact that none of the medalled work is particularly large in size. Indeed, two of the medalled pictures are considerably below the average size. It is interesting to note that several of the works from negatives by the late H. P. Robinson found purchasers.

There appear to be one or two discrepancies in respect of the advertisements in the catalogue, which, by the way, show an increase over those in last year's catalogue. The address of the printers of the frontispiece is stated to be at Lancaster in one place, and Leicester in another; and the indexing of the advertisements does not appear to be quite complete.

It is fairly certain that the general verdict will be that, taking it as a whole, the forty-sixth Annual Exhibition of the Royal Photographic Society is a good one. The most hypercritical of critics will admit that there is plenty to see, and most people will say that there is much that is interesting and attractive. To appreciate it at its proper value, it deserves to be visited more than once.—I am, yours, &c.,

J. A. R.

To the EDITORS.

GENTLEMEN,—With reference to my letter in your issue of the 18th as to the R. P. Society, I yesterday received an answer from the Hon. Secretary explaining matters and expressing regret. Will you kindly, in justice to that gentleman, publish in your next issue the enclosed copy of my answer, which speaks for itself.—I am yours, &c.,

E. LLOYD.

25, Colville-terrace, Bayswater, October 20, 1901.

[COPY.] "October 20.

"Dear Sir,—I was very glad to get your letter yesterday, also one from the Assistant Secretary explaining that, through inadvertence, he did not hand my letter of the 5th inst. to you until the 18th inst. This, of course, exonerates you from the charge of being discourteous. . . .—Yours faithfully, E. LLOYD.

"The Hon. Secretary R.P.S."

THE WOOLWICH PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—I take this opportunity of enclosing a report of the Woolwich Photographic Society for the year ending September 30 last, and should be glad of a short notice.

I have some pleasure in sending this, as it tells of good labour done. We give no awards, the Society being sustained purely by the keen photographic interest of its members, among whom we have the plea-

sure of including Mr. Douglas English, B.A., one of the medallists at the Royal.

I wish here to record my best thanks to those gentlemen of the photographic press in general, and to yourself in particular, for the kindly notice given in response to my individual personal appeal at the last South London dinner, the press feeling displayed being encouraging to the members, who were grateful for the recognition given.—I am, yours, &c., C. CHURCHILL.

5, Annandale-road, Greenwich, S.E., October 19, 1901.

THE PROPER RECOGNITION OF PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I find in the JOURNAL of August 16 a very friendly criticism of one of the features of the proposition submitted by me to Governor Francis, President of the Louisiana Purchase Exposition (World's Fair), to be held in this city in 1903.

"Cosmos" takes exception to the suggestion that the pictures entered for exhibit should be submitted to a jury of competent artists, not photographers. Under different circumstances this might be a stultification, but when the existing conditions are considered I believe the wisdom of my suggestion will be conceded. What are those conditions? Heretofore, with a single exception, and that an accidental one at Philadelphia in 1876, at every international exposition pictorial photography has been classified with products of manufacture, and exhibited in a manner such that displays were practically lost. One has always had to go on a special hunt for photographic displays—hidden in some obscure corner, or up in an out-of-the-way balcony. Now, we want photography recognised as one of the arts. We present our claim for a separate building, devoted wholly to pictorial photographs, on the basis that they are art products. I am aware that many artists who wield the brush and pencil still sneer at the photographer and his work. Consequently I would consider it more creditable to our craft if artists, as such, accord to our creations the position which we claim they should occupy. The Committee of the Directors of our World's Fair, which will have the greatest influence in the decision of this matter, is the Art Committee. Do we not fortify our position by showing a willingness to submit our work to our severest critics?

There is another phase of this subject. In this country there are among the more prominent photographers two well-defined factions, or schools, if you prefer. They are, in photographic matters, as bitterly opposed to each other as orthodox and heterodox in religion, or as Democrat and Republican in our country's politics. It would be next to impossible, in my judgment, to appoint a jury of photographers that would be tolerated by both schools. It is but right and just that each should be fairly judged, and it seems to me that this can be best accomplished by selecting the jury from among artists, broad-minded enough to recognise artistic conceptions and creations wherever found, regardless of the medium in which they find expression. "Cosmos" will admit that even among painters, sculptors, etchers, and the like, such men can be found. Then, too, he should remember we have none of that "silly worship of initials" to which he refers on our side of the Atlantic, at least not so far to the interior as the sunset side of the Mississippi. I wish to say further that the suggestions published are wholly individual. Should we have the separate building in 1903 it by no means follows that my ideas as to the regulations of exhibits would be adopted. I do not wish to create the impression that my views will be the only ones considered. What I want to see accomplished is the proper recognition of photography. With that an assured fact, "Cosmos" and I will not quarrel about the secondary arrangements.—I am, yours, &c.,

St. Louis, Oct. 5, 1901. J. C. STRAUSS.

THE PHOTOGRAPHY OF MOVING WHEELS.

To the EDITORS.

GENTLEMEN,—I have recently seen a snapshot of a motor-car taken whilst running at the rate of 30 miles an hour. The details are quite distinct, with the exception of the upper spokes of the wheels, which are blurred. This effect is, of course, due to the well-recognised law that the upper part of a wheel moving along the ground has a greater speed than the lower part at any given moment. In connection with this a friend has put to me the following problem, which I am unable to solve:—"Given the same exposure and conditions as to light, etc., would there have been any difference in the result if the photograph had been taken from another vehicle moving alongside at the same rate of speed, and, if so, what?"

My friend seems to think that under such circumstances the blurring of the upper spokes would disappear, but I confess I cannot see this. May I venture to ask for your opinion, or that of your readers, if you think the matter sufficiently interesting.—Yours, &c., J. M.

October 15, 1901.

THE SEFTON PARK PHOTOGRAPHIC SOCIETY'S THIRD ANNUAL EXHIBITION.

To the EDITORS.

GENTLEMEN,—I beg to inform you that our third Annual Exhibition will be held January 7 to 11, 1902, both days inclusive. Entry forms will be ready in a few days, and will be sent post free to all who apply for same. Entries close December 28.—I am, yours, &c.,

GEO. BIRTWHISTLE, Hon. Exhibition Secretary.

7, Gainsborough-road, Liverpool, October 16, 1901.

THE PYRO-ACETONE DEVELOPER.

To the EDITORS.

GENTLEMEN,—Having used the pyro-acetone developer almost exclusively for the past three years, I shall be pleased to give your correspondent, "A. M. Z.," the benefit of my experience if he will communicate with me.—I am, yours, &c., J. TILFOR.

231, Elgin-avenue, Maida Vale, W., October 19, 1901.

THE TRAILL TAYLOR MEMORIAL LECTURE.

To the EDITORS.

GENTLEMEN,—Mr. Archer Clarke's remark is quite true that the Committee feel great satisfaction in the fact of the free character of the Traill Taylor Memorial Lecture, and I trust that he will see, after further consideration, that the present arrangement is quite right, when the circumstances under which the lecture is given are taken into account. The Royal Photographic Society has generously placed the use of the New Gallery at the disposal of the Committee free of charge, but we have been asked to grant admission by ticket, so that the man in the street may not have free run of the building. The gallery is rented by the Royal Photographic Society, and it is their duty to protect the property in their charge. I have sent a supply of tickets to each of the London and suburban photographic societies, and, to facilitate further distribution, have written to the photographic press that I shall be happy to send tickets upon receipt of a stamped addressed envelope. The income from the fund is insufficient to permit of tickets being sent broadcast through the post, and I trust that those who have the interest of this memorial at heart will not object to a request which tends to diminish the cost of administration, as well as the work that falls upon your obedient servant.

P. EVERITT, Hon. Secretary.

88, Evering-road, N., October 18, 1901.

RE PROFESSIONAL DISCOUNTS AND OTHER MATTERS.

To the EDITORS.

GENTLEMEN,—The only solution that I can see to the matter of professional discounts, so as to be fair to dealers and photographers alike, is for the plate-makers to allow a sliding-scale of discounts, according to the amount of plates purchased at one time, say, the full dealer's discount on £10 and upwards; three-quarters ditto, over £5 and under £10; half ditto, over £2 10s. and under £5.

This would prevent several evils, viz.: (1) The chemist who sells but little plates, but is enabled to cut the prices in trade enlargements, etc., by reason of the extra discount he gets off his material. (2) The photographer who practises as a dealer as well, and exhibits a couple of cameras in his window as a blind, and does not sell half a dozen boxes of plates in a year. This is the particular fiend that ought to be stamped out, as he has an unfair advantage over his brethren. (3) The half-and-half, the amateur-professional, who works Saturday and evenings at photography, and goes to his calling in the week. This fellow can be found in every town, and by reason of the bill-heading, "John Jones, Photo-Artist," gets the professional discount, and generally cuts the prices, as he does not depend upon it for a living, and is therefore in a position to do so.

With regard to travelling landscape and professional photographers who do not possess studios, I think they ought to have the same advantage as their brethren. This is where a sliding-scale of discounts would come in, for it depends, then, upon the amount of trade a man does what discount he gets. Many dealers (especially in small towns) sell but little plates; a great deal less than the smallest professional photographer uses. Why should the dealer get better terms than the photographer? Most photographers have their plates straight from the manufacturer, and I think should be treated under the same terms. "Northern Light" and "J. A. R." mention about "photographers of high standing sending operators to various parts soliciting orders for various purposes." This they seem to think is disgraceful for members of the P.P.A.

Personally, I see no harm whatever in it. I think it is healthy competition, and generally awakens the slumbering professional, and shows him what can be done by tact and perseverance. I must remind them that England is a free country, and there is no more harm in Peek, Frean's selling biscuits in Reading, the domain of Huntley and Palmer's, which they and other biscuit firms do, than of professional photographers canvassing out of their district. A man is known by his works, and a good man need not be afraid of competition.—I am, yours, &c., OSBORN THORNBERY.

Derby-road, Worcester.

PROFESSIONAL PHOTOGRAPHERS AND PLATE-MAKERS' DISCOUNTS.

To the EDITORS.

GENTLEMEN,—I beg to protest against the apparent hostility of professional photographers to all dealers, as expressed in several letters addressed to you recently. I quite believe that they have been, and will continue to be, a great help to the professional and amateur; for how many little articles are there the sale of which would not repay the cost of separate manufacturing (at least when they are first introduced) and advertising, whereas a big firm can undertake the production and sale in combination with many other similar articles, all of which are advertised in his catalogue and by his travellers; he also keeps a large stock of all requisites, which saves much times and saves the bother of having several accounts.

The dealer has nothing to do with the allowance of discount to professional photographers, as that is settled by the Plate-makers Association. By dealers, I don't mean local chemists, ironmongers, stationers, etc., but people such as Marion's, Sichel's, Fallowfield's, etc. If the Plate-makers' Association allowed such as these to give the same discount to professionals as they allow them to give to chemists there would be very little to grumble at.

Why cannot a photographer get the 25 per cent. from the big dealers as well as the local chemist? Any of the chemists in my district will allow me 10 per cent. on photographic goods, and get 25 per cent. himself, though he rarely ever handles them. He orders from a big dealer's, and they forward direct to me. Surely I have as much right to the discount as he has, who perhaps only stocks one quarter-plate box of plates. I don't begrudge him his 25 per cent. when supplying amateurs, but don't see why we cannot have the same.—I am, yours, &c., DISCOUNT.

October 19, 1901.

THE "SPY MANIA" ABROAD.

To the EDITORS.

GENTLEMEN,—Allow me to call your attention to the following sentence printed in the esteemed JOURNAL, page 643:—"The spy mania seems to be as rampant as ever on the other side of the Channel, and English amateur photographers would do well to avoid giving offence to our impressionable neighbours." When you are wrong I respectfully call your attention to it, but when you are right I take the liberty to say so, and even improve on it if possible. Without knowing if the same English objection as to this "spy mania" holds good for Germany and Italy, which would not make it a French speciality, I must say that you are right in your above writing. English tolerance and liberty-loving runs so high that I am not astonished at your finding fault with this miserable French "spy mania." In one or more former numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY you objected rightly to the same defect in French manners as to allowing English amateurs to photograph forts or around them, and now it is even gunboats. This, I understand, is carrying the thing too far, and however it is difficult to see at first glance the difference between an English spy and an amateur, it is easy enough to discern from a spy a common English button-presser. Therefore, as a consequence, the ridicule of this spy mania.

Now let us reverse the table a little. You know I am not a spy. You know England has not got to this spy mania, and is therefore entirely liberal all round. I therefore beg to ask your kind services in obtaining for me the permission (if at all necessary) to take views in and around Gibraltar, which is, after all, only a rock, and when this easy matter is obtained then I would like to be allowed to take views in and around Woolwich. To begin with, this is sufficient at present, but I may ask some more permits later on, and then showing these views as taken by me on the boulevards of Paris, we will put these mean Frenchmen to shame with their nonsensical "spy mania," as applied to inoffensive English amateurs. Tirez les premiers, Messieurs les Anglais.—I am, yours, &c., A. LEVY.

Asnières (Seine), October 20, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED:—

J. E. Reeves, 48, Hermit-road, Canning Town, E. *Photograph of West Ham United Football Club.*

W. H. BRISON.—We are pleased to hear that, by acting on our advice, you have brought the firm "to book," and that they have paid the money. You will get the costs in due course. Such people require dealing with firmly, and then they "pay up."

VELLUM MOUNTS.—"MOUNTS" asks: "Can you tell me the address of firms that supply vellum mounts?"—In reply: We imagine that any of the large houses, such as Marion's, Houghton's, &c., and the like, will supply the mounts to order, if they do not stock them. We know of no one who really makes a speciality of vellum mounts.

ELECTRIC LIGHT FOR LANTERN.—"LECTURE" asks: "Which do you consider the best light for the lantern, the arc light or the incandescent light? I want to work with as little trouble as possible, but I must have a good light, as some of the slides I have are denser than they ought to be?"—In reply: By all means use the arc light if you wish to get the best effects.

BOOK ON PHOTOGRAVURE.—A. B. writes: "I should feel greatly obliged if you would kindly inform me whether I can obtain a book of instructions on the photogravure process."—In reply: "The treatise on Photogravure in Intaglio, by Herbert Denison, is a very good work. It may be had from Dawbarn and Ward, Farringdon-avenue, E.C., or through any photographic dealer.

MR. W. W. WINTER, of Midland-road, Derby, writes: "If you would put us in communication with your correspondent 'Constant Reader,' we can give him particulars of a camera back, whereby he will be able to take 15 portraits (more or less) with the aid of but one lens, on one plate (cabinet size). Paragraph referred to is on page 672 (top left hand corner) of last week's issue.

DEFECTIVE BURNISHER.—G. L. writes: "Can you please tell me how to remedy my burnisher. Nearly every print I put through is more or less scratched. I use P.O.P. and a burnisher, 10½-inch roller? Also, please state what is best to clean with."—In reply: It is probable that the burnishing surface is scratched, in which case it must be re-polished. The most satisfactory way will be to send the burnishing part of the machine to the makers to do the needful. Unless it is badly scratched the cost will not be great.

ADDRESSES WANTED.—P. H. H. writes: "Could you inform me of the names or addresses of people where I could purchase some specimens for show-case purposes?"—In reply: We know of no one who supplies specimens for show-case purposes. Most photographers exhibit their own productions, from which the public can judge of the work turned out of the establishment. You might possibly get some specimens by advertising for them. But is it honest to show in your cases better work than you can produce yourself?

HEATING DARK ROOM.—GEO. MITCHELL writes: "My dark room, which is very small, is situated in the basement, and in the winter is very cold. I cannot get gas down there, and, of course, there is no fireplace. I want something inexpensive which will not give off injurious fumes."—In reply: The only thing we can suggest is one or other of the paraffin and kerosine stoves, of which there are several inexpensive forms. The fumes from them are not injurious in photography, and if the stove is kept clean, and the wicks in order, they will not be unpleasant.

UNPAID SITTINGS.—A. M. B. writes: "Two years ago a London gentleman, who was then staying at a farm-house, about seven miles from this town, had three members of his family photographed (cabinet) in our studio. The proofs were pronounced satisfactory, and the copies ordered were duly sent to the London address; further copies, moreover, being written for about two months later. We have made repeated applications, per post, for a remittance of the account, but no notice has been taken of our communications. Must proceedings be taken in London, 50 miles distant? or can we get at the individual through the County Court of this district?"—In reply: Summons in the County Court of the district in which the debt was contracted—that is, in your own town.

DISCOLOURED COLLODIO PAPER.—G. DUNKLEY writes: "I have bought a 'job lot' of photographic materials, amongst which are two or three quires of ———'s collodio-chloride paper, of which I enclose sample. You will see it is much discoloured, and the colour does not disappear in the fixing. Can you tell me of any way in which the paper can be utilised?"—In reply: We regret we cannot. We should judge by its colour that it has been made some years, and therefore become useless. The only way to utilise it will be to burn it, and add the ashes to the stock of residues.

INTENSIFICATION; DEVELOPER.—J. B. writes: "(1) Please say by what means, if any is possible, a negative intensified with mercury and sodium sulphite may have the intensification removed or reduced. (2) Please refer me to any number of your JOURNAL or ALMANAC where stand development is explained."—In reply: (1) Re-immerse the negative in the bichloride, and that will bleach it again, but stop its action when sufficient reduction has been obtained. (2) There is nothing to explain in "stand development." The plates are merely put into a very weak developer and allowed to take their time.

PYRO-ACETONE DEVELOPMENT.—A. M. Z. writes: "While thanking you for your answer in your issue of 18th inst., you do not give me the information I require as to the pyro-acetone developer. Supposing in developing a plate I mix a developer containing pyro gr. 2, sodium sulphite anhydrous gr. 10, acetone min. 20, water to oz. 1, and I find that, owing to the plate not developing sufficiently quickly, it is necessary to add more acetone (i.e., accelerator), is it necessary to add also more sulphite to keep the proportion of sulphite to acetone as 1 to 2?—In reply: It is not necessary to add more sulphite.

LENSES AND DEVELOPERS.—"TERRANT" writes: "(1) I should like to know what kind of lens is most suitable for outdoor groups, whole-plate size. I use the amidol developer for bromide enlargements, but can never get all the amidol to dissolve. I weigh as per instructions, and pour the necessary amount of boiling water on it, and stir it about for 10 minutes or so, but fail to dissolve the amidol."—In reply: (1) The best lens for the purpose is one of the anastigmatic type, with an aperture of f-6 to f-8, and about twelve inches focus. Or, if price is an object, one of the R R type of similar focus. (2) You do not say the formula by which the developer is to be compounded. However, if you use more water you will get the amidol into solution. You can then employ proportionately less water in diluting for use.

LANTERN FOR ENLARGING.—"BROMIDE" says: "(1) I have a lantern of the old "Sciopticon" make, which I have used for slides for many years. I enclose an illustration, and shall be glad if you will tell me how to adapt it for making good enlargements. (2) The position and size of stops required in the objective. (3) Whether the condensers (4-inch) are suitable, and in right position. I can manage any mechanical work, but do not understand the necessary optical requirements."—In reply: (1) The lantern will do very well as it is, provided that the lens has its chemical and visual foci coincident, as most likely it has. (2) The stops should be in the centre of the combination, as in the ordinary portrait lens. (3) The condensers are in the right position, and will be suitable for negatives not exceeding the size of the lantern slide.

THE SULPHOCYANIDE OF AMMONIUM TONING BATH.—L. B. writes: "Will you be good enough to let me know through your honourable journal how to prevent sores breaking out on my arms and hands through using sulphocyanide of ammonium toning bath. I generally tone on the average 6000 prints per week. Is the above bath injurious to health, and what would be the cure?"—In reply: The only thing we can suggest in the way of a preventative, if the trouble is really caused by the sulphocyanide, is to put the hands in the solution as little as possible, and to thoroughly wash them as soon as the work is done. You might try rubbing the hands and fingers over with lanoline, or vaseline, before beginning to tone. That will, to an extent, prevent the solution entering the pores of the skin. As for the cure, you had better consult a medical man.

COPYRIGHT MATTERS.—"POLLAY" writes: "(1) You kindly made copyright for me five or six photographs about three years ago, and as they are some of a large selection of similar pictures, I am not sure which are actually copyright and which are not. How can I find out? (2) A periodical has been sent to me by a friend, published by a large firm, more as an advertisement of their specialities. The frontispiece is a copyright photograph of mine, and the date of publication is March, 1901. Is it too late to take steps in the matter? I might mention that no charge is made for the paper in question."—In reply: (1) Only by searching the register at Stationers' Hall. If you know about the dates, it will be an easy matter. (2) No; it is not too late, but we should advise you to take proceedings at once. The fact that no charge is made for the publication makes no difference whatever. Your copyright has been infringed all the same.

CAMERA MAKING.—A. FINLAYSON writes:—"I have a ¼-plate lens by me, and I want to know if I could make a camera, either with bellows, or hand camera. Please answer, if possible, with full particulars. In reply: "Whether you can make a camera for the lens, or not, depends entirely upon your mechanical skill, and of that we have no means of forming an opinion. We should advise you to try your hand at the work. Some amateur cabinet makers have turned out very good cameras. You should get the loan of an apparatus that you approve of, and copy it.

BACKGROUNDS.—"PLATINUM" writes: "I have a plain background on which I wish to paint clouds, etc. Please let me know what is the best mixture or paint to use, or would you advise me to send it to the makers to do."—In reply: You do not say whether the background is done in flatting colour or in distemper. If the former, the clouds must be done in flatting colour; if in the latter, in distemper. If you have had no experience in background painting, it will probably be better to have the work done by the makers; or perhaps as cheap, get a fresh background with clouds.

PRINT CRITICISMS.—"COLLODIO" writes: "Can I trespass on your kindness, and ask you to do for me what you have done for others? I enclose one or two specimens of my work. Would you kindly say what you think of them? A candid opinion would be much appreciated. I may say that I have had no photographic education, my knowledge having been gained by reading, and through practice. What are my defects, and how can I improve my work? —In reply: The portraits sent show fair average work, and we have no doubt that with a more extended experience, and care, you will improve. One or two of the pictures would have been better if they had been a little more exposed. We should think that you would be able to obtain the salary mentioned in the other portion of your letter. But, possibly, you may have to take a little less for the winter months.

DEVELOPMENT.—J. BROWN writes: "(1) Although a developer of pyro and metol is recommended for Imperial Sovereign plates, do you think as good results will be obtained by developing these plates with such a formula as the Ilford pyro soda? (2) Which of the developers, pyro and kachin, produces the better negatives? (3) Will you kindly give a formula for bromide paper with kachin? (4) Can kachin be used for 'gaslight' paper?"—In reply: (1) We should say so, though we have not tried. Why not try the experiment yourself? (2) Both will produce excellent negatives. Some prefer one and some the other. (3) British system—kachin, 160 grains; sodium sulphite (cryst.) 2½ ozs.; water, up to 20 fl. oz. Sol. B: potassium carbonate, 1¼ ozs.; potassium bromide, 4 grains; water, up to 20 fl. ozs. Metric system—Sol. A: kachin, 9 grammes; sodium sulphite (cryst.), 62.5 grammes; water, up to 500 cc. Sol. B: potassium carbonate, 31.25 grammes; potassium bromide, .23 grammes; water, up to 500 cc. Take equal parts of A and B. In case of over exposure add a few drops of 10 per cent. solution of bromide. (4) Yes.

FLASHLIGHT PHOTOGRAPHY OUT OF DOORS.—"FLASHLIGHT" writes: "Can you suggest a method of photographing a procession of people by night. The part of the procession I want would be about 300 yards long. I imagine it might be done with flash lights along the route, but cannot see how to start them all at once. Electric light is out of the question, as there is none in the town. If you think the flashlights might do, can you give me an idea how many would be required, and how much powder for each."—In reply: In undertaking to photograph a procession 300 yards long at night you are accepting a rather "large order," though the thing may be possible. The only way to start the lights simultaneously is to fire them electrically. Failing that, the lights might be fired from different points at nearly the same moment, if all the different operators were to fire theirs at the same moment that they see a signal flash. We can give no idea as to how many lights would be required, or the amount of powder required. That will depend upon how far they are from the procession. Better make a few preliminary experiments.

COLLODION FOR LANTERN SLIDE MAKING.—F. J. DEARSLEY writes:—"I have a bottle of Mawson's negative collodion and iodiser for iron development, and am anxious to know if it will answer for lantern slide making, or, if not, how I can alter it? Also, what formulæ would you advise for toning to a decided blue black, and what solution can I use to entirely clear out the skies before toning? Are there any books published on the wet collodion (slides) process, and where obtainable?"—In reply: The collodion will do quite well. If the plates are developed with the ordinary iron developer they will have much the tone you desire; if not, they may be toned with a plain solution of chloride of gold. If the process is rightly worked the skies will not require clearing. If they appear slightly veiled, that will disappear when they are varnished. A weak solution of iodine in one of iodide of potassium will clear any part of the picture, if it be afterwards treated with a dilute solution of cyanide of potassium. But that should not be necessary. Any of the old books on photography, that include the collodion process, will give the desired information. Hughes' or Abney's are as good as any.

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EX CATHEDRÂ.

The Effect of Monopoly upon Trade.

We recently drew the attention of our readers to the remarks of the Editor of the "Photographisches Wochenblatt" concerning the monopoly of the platinum industry. We dissented from his opinion that the owners should be controlled by a jury of commercial men, to regulate the price, and we still think it preferable that it should be left to the "higgling of the market." Platinum partakes to some extent of the nature of those articles that are absolutely limited in supply, and the price is regulated on the one hand by a species of natural monopoly, and the necessity for its use on the other. There are, however, other articles for which the raw material exists practically in unlimited quantity, and it is more especially in relation to these that the bad effects of monopoly through trusts, rings, and other devices are felt. Herr Gaedicke attempts a classification of these combinations under the headings of aggressive and defensive. The defensive ring may be justifiable for the prevention of excessive competition, which might affect permanently the quality of an article, but it means an organization of forces that might be used for illegitimate purposes as, for instance, maintaining prices that would fall in the ordinary course of events. On the other hand, the aggressive ring merely seeks to exploit the consumers for the benefit of the monopolists, and this lays a tax on industry. Herr Gaedicke's remarks seem to be prompted by information from America concerning an international dry-plate ring, with a capital of about £6,000,000. He forecasts the action of this trust by pointing out that it will probably endeavour to obtain control of the English and Belgian glass factories and the few makes of gelatine. With the hilt of the sword in their hands, they could easily sacrifice the small makers, and prepare the way for an increase of prices to provide the dividend for capital invested in the combination. This must be at the expense of the consumers. Dry-plate makers will do well to give the matter their earnest, collective attention. It is a moot question whether the manufacture of glass can be monopolised with the same facility as that of some other articles, but under any circumstances the disorganization of the British dry-plate trade for a time would be a great misfortune for photography. Herr Gaedicke warns German glass manufacturers not to be tempted if approached by the dry-plate trust, as it would be short-sighted policy to accept a small immediate profit, rather than wait for the large demand for German glass free from control. In Herr Gaedicke's opinion, German glass need only be made with more care in regard to thickness, and it would then be admirably suited to dry-plate manufacture, if properly cut to size. Will the English and Belgian glass manufacturers have sufficient respect for national honour to resist the blandishments of the American speculators?

* * *

The German Dry-plate Industry and the Proposed New Tariff.

In contrast with Herr Gaedicke's optimism concerning German glass as a rival to the American dry-plate trust, we may cite the opinion of Herr Traut, an enterprising Munich photographer, who recently addressed the National Union of German Photographers.

Germany is anxiously discussing the proposed additions to import duties, and Herr Traut has drawn attention to the bearing of the new tariff upon the photographic trade. In Germany, glass bears an import duty of six to ten marks per hundred kilos, and it is proposed to add two marks per hundred kilos all round. Herr Traut states that German glass manufacturers have been informed repeatedly that it would be to their advantage to make good glass, free from blisters, but they have neglected the advice, and have no claim to sympathy. Even if they succeeded in making a suitable article they would raise their price in proportion to the duty so that German dry-plate makers would still be in a worse position, especially in relation to the export trade. May we not go one step further and say, that if a combination obtains control of the English and Belgian supplies, and raises the price, will not the German manufacturers also make some addition, though perhaps not to the same extent? The proposed increase of the duty on glass is certainly a menace to the German dry-plate business, for it appears that two-thirds of the plates made in Germany are exported. It is also a question whether these additions to the tariff may not incite other countries to impose further import duties upon German manufactures.

* * *

To the Memory of a Noted German Optician. We gather from the "Allgemeine Photographen Zeitung" that the hundredth birthday of Dr. C. A. Steinheil was made the occasion of a touching tribute to the memory of the celebrated physicist and optician. The Gemeindecollegium passed a resolution in recognition of the event, and decided to place a wreath upon his grave as a mark of their esteem. Dr. C. A. Steinheil was born on the 12th October, 1801, and was the founder of the firm which stills bears his name. He was invited by the late King of Bavaria, Maximilian II., to establish himself as an optician at Munich, so that the association which Fraunhofer had created for optics with that city might be preserved.

* * *

Artificial Lighting. The photographer is perhaps more directly interested in the question of artificial illumination than most persons, for he may be so circumstanced that portrait taking at night is a necessity of his business, or he may be situated in some manufacturing town where the atmosphere renders daylight of most uncertain quality, and he must perforce adopt something more reliable. He has therefore to solve the problem what that something is to be. Of course, the electric light is to be "the light of the future"; that has been settled long ago, but it is quite certain that, as long as it costs about three times as much as its equivalent in gas, it cannot be recognised as the light of the present. And although the purse of the photographer may be deep enough to go to the expense of setting up an electrical installation, the mains have possibly not yet arrived at his street, and he must therefore, for the present, put electricity out of court. Acetylene, for some reason or other, does not seem to make headway in this country, although it is largely employed abroad. We have seen grand examples of its powers at various exhibitions, and a few years ago a special exhibit was made of it at the Albert Hall, but it does not get into common use. One may walk down all the chief thoroughfares in most of our large towns and cities and look for it in vain. It is very different with the incandescent gas mantle, which is not only in evidence in every street, but has found its way to remote villages. Its light is most brilliant, the mantles have a far longer life than used to be the case, and they are cheap. Good mantles are now purchasable in London retail at 4½d. each, and in Germany, according to a speaker at the recent British Association meeting at Glasgow, they cost only 2½d. each. On the whole, therefore, and in view of the fact that it has been adopted so largely, we may look upon the incandescent gas system as being the most practicable of all recently invented methods of artificial illumination. There is another point in its favour which will tell in the near future, and which will probably lead it into keen rivalry with the electrical glow lamp. A non-illuminating gas will serve quite as well to make the mantle incandescent as will the gas now used in our houses. It is stated, on good authority, that such a gas can be produced and sold at a profit at about one-fifth the price of the ordinary product of the gas works. We may therefore look forward to the time when this cheap gas only will be made, and when mantles will replace every other kind of burner.

* * *

Vanishing London. It seems to be the fate of all big commercial centres nowadays to assume the condition of dissolving views. The change is, as a rule, so gradual, and the houses attacked are such small items in the great whole that it does not attract much attention, save that of some antiquarian, who protests in a letter to the "Times," that such and such a building, full of hallowed memories, is about to disappear, and "will no philanthropist step in to save it?" But although a building may be spared here and there, the work of the house-breaker goes on apace, and our old lamps are exchanged for new ones. The making of a new street, which is to extend from London's historic thoroughfare, the Strand, to that other great artery known as Holborn, has caused a wholesale destruction of houses. Holywell-street, with its overhanging dwellings, is completely wiped out, and the entire appearance of that portion of the Strand which lies between the churches dedicated respectively to St. Mary and St. Clement is being altered for the better. But we trust that photographic records of the thoroughfares destroyed have been preserved, so that our descendants may have some idea of London as it was before the dawn of the twentieth century. We know what good work has been done in the same direction of late years by Sir Benjamin Stone, M.P. But he was not the first to note the necessity of photographing vanishing London. About a quarter of a century ago a small society was established which called itself the "Society for Photographing Relics of Old London," and it did good work in preserving for posterity the presentment of places which were at that time threatened by the destroyer. The pictures were taken by the late Mr. Dixon, of Albany-street, and were issued to subscribers in the form of carbon prints. Some of these were of extreme interest, and we may cite as an instance the set of views of the "Oxford Arms"—an old-

fashioned inn which, with its picturesque galleried courtyard, stood almost under the shadow of St. Paul's Cathedral. The place has long ago disappeared, and its site is occupied by Amen Court. The other prints issued by the Society referred to comprised many other features of Old London which have, like the "Oxford Arms," disappeared for ever.

* * *

A Much-wanted Photograph. There are very few things in the world which have not been photographed, whether we look on its surface, or above, or below it. By aid of convenient magnesium the deepest mines and caves have yielded up their images, and, so far as cloudland is concerned, we all know that the camera is regarded as a necessary part of a balloonist's equipment. The earth's fauna and flora are extensively portrayed by means of the ubiquitous camera, but there is one notable exception, the sea serpent has not yet been photographed. Scoffers may plead that this creature is the Mrs. Harris of the animal creation, and that "there is no such pusson," and they may reasonably point to the circumstance that reports of the appearance of the creature are generally published in the silly season, in company with accounts of abnormal gooseberries, etc. But those who will take the trouble to look up the literature of the subject will find that many of these reports are of a most circumstantial nature, and are drawn up on the authority of officers of the navy and of the mercantile marine, whose veracity may fairly be considered as being beyond question. One of these reports came to hand quite lately, in the shape of a signed statement from the officers and crew of the revenue launch "Lungtsing." The chief officer of this vessel is Mr. F. Wolfe, and he tells how he sighted a serpent which he judged to be forty or fifty feet long, and how a boat sent from his ship approached so near to the monster that the latter struck one of the oars. The episode took place in the Chinese seas, and in the account referred to the serpent is described with minute detail. But why was there no camera on board, so that the verbal description could have been supplemented by a photograph? We cannot but believe that Mr. Wolfe and his crew, as well as so many eye-witnesses in the past who have signed similar statements, must have seen a serpent, or something so nearly resembling it that they mistook it for one. A photograph would settle the matter once for all, and we hope that, next time the good ship "Lungtsing" finds itself in the same neighbourhood, a camera and plate will be ready.

MONOPOLY RUMOURS IN THE PHOTOGRAPHIC TRADE.

In the first paragraph of this week's JOURNAL we refer to the apprehensions of our confrère, the editor of the "Photographisches Wochenblatt," that the recent creation of a gigantic American dry-plate combination may be followed by a similar movement designed to consolidate the whole of the dry-plate industry of England and the Continent. The information on this subject that has reached us from many well-informed quarters during the past few weeks, disposes us to regard Herr Gaedicke's apprehensions as not unreasonable. Negotiations have been entered into, we are informed, for the control of the entire output of glass used in the preparation of photographic dry plates. It need hardly be stated that with this vast idea the one name coupled is that of Mr. George Eastman, who is also said to have "bought up" the colossal dry plate, film and sensitive paper making establishments of Messrs. A. and L. Lumière, at Lyons, France. Moreover, an English factory for the production of "Kodak" dry plates is talked of; and, not to unduly lengthen the list of far-reaching intentions attributed to Mr. Eastman and the great company of which he is the head, we may close this little summary of remarkable rumours with mention of the most remarkable one of all, namely, a desire on the part of Mr. Eastman to dominate the photographic trade of the world!

We live in times of semi-panic, and the slow-going Briton who perceives his steamship lines; his tobacco; his places of amusement; his London underground railways, and other profit-yielding businesses "run" by astute Transatlantic financiers, may, perhaps, be forgiven if he betrays a little nervousness at the bare mention of a trust or combination, and wonders where the American invasion of our industries will find its limit. The particular rumours to which we have referred are, probably, in some measure exaggerated by a nervous dread that the realisation of whatever commercial projects Mr. Eastman and his company may entertain will be disastrous to British photographic industry. But a world-wide monopoly in the innumerable articles of photographic production will be rather a difficult thing to bring about and maintain, as anybody acquainted with the ramifications of a very complex trade will at once admit, so that this "danger," at which nobody would probably smile so much as Mr. Eastman himself, may be at once dismissed. Far more serious consideration, however, is demanded when it comes to the particular case of English plate, film and paper manufacture. Here the possibilities of monopoly cast a broad and well-defined shadow of danger, to which no patriotic and thinking person can afford to close his eyes. The channels of supply for glass, paper, gelatine, chemicals, and, possibly, celluloid, are so few and so narrow, that command of them, given sufficiency of capital, is not insuperably difficult to obtain, and a virtual, if temporary, monopoly in the indispensable requisites of the photographer could thus be set up by the exchange of a few briefly worded agreements.

We hope, of course, that these monopoly rumours will shortly prove to be baseless: but a sense of duty to our readers obliges us to reflect the very general feeling which prevails in regard to the matter. To foresee the full effects which would follow the concentration of British plate, film and paper manufacturing in one concern is not possible to the shrewdest amongst us, but it is tolerably certain that a violent dislocation of the trade would immediately occur. The forcing up of prices; the prohibition of imported plates, etc.; the stifling of competition; the crushing out of small makers, and the termination of the independent existence of the larger firms: some at any rate of these things must inevitably follow in the footsteps of a monopoly, trust, or combination. The sentimental aspect of the matter is one, too, not to be lightly ignored. In regard to dry plate making Britain is the very cradle of the industry, and the over-sea trade done in English plates is enormous. We seriously question whether American-controlled, if British-made plates, would sell so well as the uncontrolled productions do. There is much in the association of ideas, and the

photographer who "swears by" a particular brand of plates or paper, likes to feel that he is using the productions of a free English house. But this is a minor point. We have no doubt that the course of affairs in the photographic trade will be closely watched during this winter. Granting that the control of the glass, paper, gelatine, etc., is all that is sought by Mr. Eastman, and that the manufacturers are to be left unfettered as at present it remains to be seen whether even this state of things would be tolerated. Again, given an English monopoly, free trade, and the nearness of France, Germany, and Belgium have to be reckoned with. It would be a difficult thing to exclude all continental plates and papers from this market for any length of time, as new glass, gelatine, and paper works would assuredly be started abroad in opposition to the "tied" factories. It is not inconceivable that the same thing would happen in this laggard England of ours. We take leave of these rumours for the present. Their declared baselessness, we are persuaded, would give satisfaction to those who have the vital interests of British photographic manufacturers at heart. It is remarkable to contemplate how greatly, under the stimulus of competition, the British photographic industry has expanded during the last decade. In very recent times complaints have appeared that labour and raw materials have become more costly and that profits have been increasingly difficult to sustain: but it is doubtful if monopolistic combines could remedy that state of things.

WINTER WORK IN SMALL STUDIOS.

Trade is slackening off as the days get duller and shorter. Soon the professional will have plenty of time on his hands. If the past season will have been a good one, the leisure for a while will not prove ungrateful. It is also useful. It keeps him from getting stale. But too much leisure soon palls upon a busy and an energetic man. Yet the winter season gives time and opportunity that may be with advantage devoted to the enlarging of business in a direct way. There is leisure for thinking of advertising. We presume there is now no need to discuss the value of advertising in general with an intelligent business man of average push. He must see clearly enough that it is nowadays the main essential of success. The photographer does not make anything like the use he should of the high and effective advertising power which his special kind of work places in his hands. The peculiar incidence of weight of business in the year makes against him perhaps in this. In summer he is too busy to need much more work, and in the winter he knows he cannot induce customers to walk into the studio, let him advertise ever so well. Advertising, too, he realises is expensive work, and more particularly adapted to concerns where larger amounts of capital are invested, and returns handled, than in his business. All this is true, but there are directions in which he can act.

It will probably be admitted by all who have studied the art of advertising that the main elements that mean success are persistence, novelty, and an appeal to some well-defined human quality. Even a slight attention to street hoardings and the pages of magazines will readily prove this. The value of persistence is clear, for owing to it the names of certain pills, soaps, and condiments have become household words. Novelty is as well marked, and equally valuable. Chief amongst novelties are pictures. A catchy picture is a gold mine, and, without adding further to the value of any special one by mentioning it here, instances will readily occur to all our readers. As to the last factor, an appeal to a broad and general human quality, the pill fortune is built up on the solid basis of the superior attraction to normal human nature of the statement of the quack over the restrained, more scientific, and truer one of the doctor; the soap fortune is built upon vanity, and the desire to reduce expenditure of elbow grease; the condiment fortune upon love of eating nice things. The same elements introduced by the photographer would mean equal success to his advertising. Persistence from the nature of his work he should be reasonably blessed with, and know the value of. Novelties in pictures he is in the best position to produce, and in the universal love of a photograph of one's self, his sweetheart, wife, children, and friends, there is surely an ample introduction of the human touch. Space will not admit of many examples to prove the point, but we quote one for the purpose, viz., a method of inducing people to go in for Christmas cards. The photographer, knowing the people of his town, should pick out the likeliest, as to means and so on, for his purpose, whom he may have taken in the past season, reduce their carte-de-visites and cabinets to a suitable size, mount one upon a good Christmas card, and send it as a sample, with a neatly got-up circular to something of the following effect:—"The natural falling off in the taking of portraits in the dull and dark winter season enables us to devote attention to other branches of our work which can be carried on by artificial light. The preparation of private Christmas cards is one such branch. We beg to enclose herewith for your inspection a reduction to suitable size, and mounted, of the picture of your little girl, whom we had the pleasure of taking in the summer. Her dainty little form thus presented, we venture to suggest, would form a most effective and agreeable improvement upon the ordinary Christmas card. If you care for the idea, our prices are ..... In any case, pray accept, with our compliments, thanks for past support.—Yours faithfully, ——."

The pictures would be of suitable size, and gain the charm that attaches to all small things, from children, puppies, and Shetland ponies, to pictures. Artistically got up, very few parents, young men, and lasses would be able to resist buying a dozen—and a mere dozen to many Christmas card senders is a very small number. All would not mean, of course, immediate further business, but not one would be lost. All would lead to a favourable opinion of the sender as a sensible and smart man of business, to whom they would go later by preference when they wanted any photographic work done. This simply carries us on to Christmas, half-way through the winter. After Christmas it might not be a bad plan to make a few head and bust miniatures of figures from groups that may have been taken and submitting them in a similar way to their originals. There are a hundred other different—maybe better—ways of advertising, which the leisure of winter could materially help into practical development and gain. The suggestion

of possibilities is what we seek more particularly to convey. It all means time, trouble, and money. But so does everything else worth gaining. If the suggestion were adopted it would mean a brisk, active man full of work and hope in winter, realising that he is enlarging his business connections along good lines, instead of, too often, a grumbler brooding over the studio stove.

SOME NEW PRINTING PAPERS.

[A Paper read before the members of the Croydon Microscopical and Natural History Club.]

Recently, several new printing papers have been placed on the market, the object being to enable prints of various colours to be obtained with simplicity and ease, and so do away with the somewhat troublesome and uncertain process of toning as usually carried out. Whether these papers will prove a commercial success; or whether, which is more important, they will prove to be permanent, I think it is too early to speak positively, although the makers say they are so; but certain it is that very pleasing results can be obtained with them, and with very little trouble. I think it is always better, if possible, to tone all prints in diffused daylight, as it is so much easier to judge the colour than by artificial light. Although the sulpho-cyanide bath can be made to yield prints of great beauty, yet I fancy this bath is responsible for a greater number of bad prints, as regards colour and double toning than any other toning bath ever suggested.

Well, to-night I propose to treat of three of these new papers, *i.e.*, Paget self-toning, Carbona, and V.B., reserving till next month the consideration of the remainder, some three or four in number.

First, then, Paget self-toning paper is a collodion paper, prints rapidly, is extremely easy to work, and gives good colours. I hand round some papers of instructions, and then proceed to finish off some prints I have made and brought with me. You will notice that salt may or may not be used; if employed, a colder tone is obtained than the colour given when no salt is used. A rather greater apparent loss is suffered with the salted print than the other, which may not be without advantage, as if you over-print, the necessary reduction may be got by using the salt solution. I show you two prints, one of which is over-printed, the other about right, and on finishing them off you will see exactly what I mean, but this colder tone may not suit all subjects. The prints are then rinsed, fixed in hypo, two ounces to one pint of water, for fifteen minutes, washed for one hour and dried. Like all collodion prints they may be pressed between blotting paper and dried before the fire. One caution is necessary, be careful not to crack the collodion film.

The V.B. paper, so called because the prints obtained with it are of a Vandyke Brown colour, is even more simple in use than the Paget, and the colour is decidedly pleasant. All that is necessary is to print lightly in a bright light, but *not* sunlight, and immerse the prints in water; the first effect noticed will be a change of colour to rich brown, gradually lightening to a lemon colour, after two or three changes of water. When this stage is reached, the prints are transferred to a very weak solution of hypo, quarter of an ounce to one pint of water, for about thirty seconds, then washed and dried; they darken considerably in drying. A colder tone may be got by leaving them longer in hypo. I have made several prints on this paper, which I will now proceed to finish off. One naturally wonders what this paper can be to require so short a time to fix in such a very weak solution of hypo; I noticed that this question was raised at one of the London societies the other day, but the maker said it was all right. These prints, like Paget's, can be blotted off and dried before a fire. What I always use is Robosal blotting paper for *all* kinds of prints, even the gelatine may be squeegeed on to it to dry them without damaging the surface. My experience of this paper is that it wants printing darker, and is not quite so sensitive, as the instructions would seem to indicate. Through the kindness of Mr. Mallandain I am enabled to give you samples of this paper.

Carbona paper, the last I have to mention, is an interesting paper to work, and can be had either matt or glossy. This is a not a self-toning paper, but pleasing shades of brown or black can be easily obtained by using the formulæ given by the makers. I show you several prints I have done, and will now proceed to tone some prints I have made and brought with me, also some untoned prints kindly sent by Messrs. Griffin, who also send mounted prints and papers of instructions. These instructions are too long to read all through, so I will content myself with handing you copies, and merely making comments on them as I go along. The acetate and borax bath is so easily made and keeps so well, unmixed, that there is no occasion to buy it, though Messrs. Griffin supply it in the form of dry powder, a few samples of which I give you. Various tones from brown to black may be obtained with it by varying the strength, but if the best black is wanted, the *matt* paper should be used with the platinum bath, a formula for which is given, or any of the usual acid platinum baths. With platinum toning printing should be carried further than for silver toning. As in either case the toning is very rapid, only a very few prints should be toned at one time. A table is given showing, approximately, the length of time required to obtain any given colour. A form for combined bath is, as I think, injudiciously given, which cannot be recommended either for this or any other paper. I may say that with none of these new papers have I noticed any uneven or double toning, which is so common with the sulpho-cyanide bath. I hand round several finished prints on each of these three papers, which will prove the truth of that statement. I always use the cabinet size of paper, it saves trimming, and if an edge is wanted, Percy Lund's Nature mounts supply the want at once. In conclusion, I have to thank the makers of the papers for their kindness in responding to my request for samples and instructions.

J. H. Baldock, F.C.S.

THE APOCHROMATIC COLLINEAR LENS.

[A paper read before the Royal Photographic Society and reprinted from its "Journal."]

Since the discovery of the principles of achromatism, manufacturing opticians have been endeavouring to make their instruments more perfect by obtaining absolute achromatism. Experiments in this direction were first made in connection with the oldest optical instrument, the telescope, the relatively simple form of which has for a long time engaged the attention of mathematicians, although up to the present the problem of making completely achromatic telescope objectives can by no means be considered finally solved. Remarkably perfect microscope objectives—the Abbe apochromats—are available, and they are found indispensable for critical work.

Before drawing your attention to the production and application of perfectly achromatic instruments for the microscope, terrestrial and astronomical telescopes, I would first make a few introductory explanations.

All that I have to describe in this paper refers to the problem of correcting the secondary spectrum, as it is usually called. The term secondary spectrum is the name given to the remaining uncorrected colour of an ordinary achromatic telescope objective. The correction for the primary colours is generally obtained by the use of two lenses, a converging lens of small dispersion, and a diverging lens of large dispersion, the well-known crown and flint glasses. This kind of combination of two glasses permits of the correction of two colours, and, with the glasses obtainable until quite recently, of only two colours.

The precise colours of the spectrum which are to be brought together are naturally determined by the purpose for which the instrument is required. We will take three cases. Firstly, for ordinary visual observations, the telescope objective should be chromatically corrected so that the rays which make the strongest impression upon the retina have the greatest attention, and, consequently, the remaining secondary spectrum does as little harm as possible. Fraunhofer was the first who made accurate research in that direction, and among later authorities, I will only mention Seidel and Schiebner. The result obtained theoretically, which is found to be accurate in practice, is that the most rational division of errors and the utmost efficiency are obtained if the light of the Fraunhofer lines C and F are brought together, viz., the red and green-blue hydrogen lines. This is on the supposition that the object observed be white. If it

be coloured, the centre of the spectrum is nearer the red or the blue side. For instance, the telescope used by Schiaparelli in observing Mars was specially corrected for red light, as this observer chiefly desired to see fine details, which cannot be taken up with ordinary telescope object glasses. As a general rule, we are considering that the eye and the eye-piece are achromatic. It would take too long to consider the cases in which the eye and eye-piece show considerable colour.

The above method of correction for visual observations is the opposite to that required for photography. In order to concentrate the actinic rays as powerfully as possible on the plate, the blue-green Fraunhofer F line and the indigo-coloured hydrogen line must be brought together. It must be remembered, however, that we cannot definitely fix the correction of object glasses for actinic light, because the plates used frequently differ very much in their sensitiveness for light of any fixed wave length. As in most cases, however, only plates which are very little sensitive to physiological light are used, all objectives achromatised for actinic light will have a difference in their focus for the brightest light showing the so-called chemical focus.

This inconvenient property is so harmful that in most cases we are unable to use the rational method of achromatising only for actinic light. There is only one case, that of astro-photography, in which this defect does not matter much, as, when taking stars, sharp focussing for infinite distance can be done by means of trial and error. Unfortunately, in all other cases, nothing else remains but to give up the achromatism for actinic light, and to use in its place an incomplete achromatism, namely, by bringing together the two parts of the spectrum in which, approximately, the optical and actinic rays reach their maximum strength. This lies between the yellow line D and the green mercury line on one side and the two hydrogen lines in the ultra-violet part of the spectrum.

Bearing in mind what I have already said about the different methods of achromatising that are possible, it is quite clear that with all instruments the rays of which are regulated in the manner just described, the actinic achromatism cannot be considered, and, further, that in consequence of the want of rational division of the chromatic aberration, the amount of the secondary spectrum remaining is, in this case, larger than in the two other cases of purely optical or purely actinic achromatism.

We will now endeavour to make clear what possibility there is of removing the disturbing remainder of colour of the secondary spectrum, in order to bring instruments in this respect to the highest degree of perfection.

According to Abbe's theory, the optical position of a glass is defined by the refraction quotient for the yellow D line and the dispersion, that is, the different between the refraction quotients and the lines D, C, F, and G between each other. Moreover, the figure V serves to characterise a glass which is found by dividing the dispersion between the F and C line in the refraction quotient N'D after deducting one. By adding or subtracting, as the case may be, the dispersion and the value for N'D, are found the refraction quotients for the single lines of the spectrum which are used in the examination of an optical instrument, as regards its chromatic properties. Moreover, it is important to consider the partial dispersion which is the quotient of a dispersion between two given lines, and the dispersion between the F and C lines.

In order to give you a small example of the factors mentioned above, I append below the constant for the two forms of glass which have been used in a great number of cases for optical instruments, and from which, both in the present and in the future, the usual twofold objectives have been and will be constructed.

	n_D	$n_F - n_C$	V	$n_D - n_{A^1}$	$n_F - n_D$	$n_{C^1} - n_F$
Hard Crown ...	1·5179	0·00860	60·2	0·00553 0·643	0·00605 0·703	0·00487 0·566
Dense Flint... ...	1·6202	0·01709	36·2	0·00034 0·605	0·01120 0·714	0·01041 0·609

From these figures, the importance of which you will understand, we can see the extent of the secondary spectrum.

You will observe that the partial dispersions (that is, the figures under the dispersions), for example, between G and F, for both sorts of glass are different. This means that with crown glass in comparison with flint glass, the blue part of the spectrum is shortened and the red part is lengthened. If we bring two colours together, for example, B, C, and F, these colours only will fall together, in consequence of the disproportional degree of refraction of the two glasses, wavelets joined together in different places, so that, for instance, between the images formed by the rays C and D, a difference of focus will exist which is owing to the secondary colour. These disappear entirely in the points where the C and F rays fall together, also in all other points, if the dispersion of both glasses could be made proportional and the partial dispersions equal each other. From this it will be seen that all opticians endeavour to use glasses the dispersion of which is proportional, for constructing their instruments.

I do not intend to go into the history of optical glass, though this subject is an exceptionally interesting one. I would only mention that, apart from a few special experiments, there are three periods of research in the production of the glasses so much desired. The first was in the beginning of the last century by Fraunhofer, of Munich, and Benedicksbeuren. The next was about 1830, by the English clergyman Harcourt, and in 1880 by Abbe and Schott, of Jena. I can only go very shortly into the results obtained by this extraordinary amount of diligence and patience. Fraunhofer was the first to be able to produce glass the size and evenness of which enabled him to produce telescope objectives which gave results, especially as regards astronomical measuring instruments, that were better than the reflecting telescopes which at that time were largely made in England, and which had been used by the elder Herschel with so much success. Neither Fraunhofer nor Harcourt was able to obtain the results so much desired by opticians, viz., the production of glasses with equal partial dispersion. It remained for Abbe and Schott to carry this out, enabling extremely important improvements to be made to a certain class of optical instruments, viz., microscope objectives.

The task Abbe placed before himself was the production of new kinds of glass from two points of view, firstly as regards the proportional degree of dispersion, and secondly in order to obtain a greater range of glasses in respect of the refraction quotient and dispersion. This second problem of the Abbe programme has been solved with most satisfactory results. Up to his time the optical properties of the glass available consisted chiefly in an increasing refraction which also increased the dispersion of colour; and at the same time only one group of glasses, namely, the silicate glasses, excluding a few slight modifications, was available.

It was only possible to produce glasses which differ from the kinds then procurable and which combine the high refraction of the dense flint with the small dispersion of the ordinary crown glasses by accurate research regarding the influence of all the elements on the optical properties of glass.

These are the new glasses, called barium silicate glasses, without which the modern anastigmat could not be constructed. Their properties are extremely useful in modern optics, as was foreseen by Petzval and Seidel.

The first point of the Abbe programme regarding the production of pairs of glasses could only be partly carried out. By replacing the principal component of glass, the silica, by phosphoric and boracic acid, groups of glasses are produced which show an important difference as regards the dispersion of colour compared with the older kinds of glass. Notwithstanding that trials in constructing telescope objectives out of these borate and phosphate glasses gave unusually good results as regards efficiency, the use of these glasses for larger instruments proved to be very limited, as they were deficient in point of durability. They therefore proved to be only an advantage for microscopy. The apochromatic microscope objectives first introduced by Abbe proved to be much more efficient in their correction for secondary spectrum than the usual achromats, the new Jena glass completely solving the problem of correcting for secondary spectrum, which Blair, Barlow, and Zenger, among others, had attempted by the use of flint lenses. As previously mentioned, the phosphate and borate glasses have one great drawback which must be taken into account, namely their want of resistance to the atmosphere. This drawback is not felt so much with microscope objectives, which are in enclosed mounts, as in the case of telescope lenses which are nearly always exposed.

For this reason, as also on account of the high price of the special Jena glass, it did not come into use for either telescope objectives or photographic lenses. Before going specially into the subject of photographic lenses, I wish to give some further details regarding the construction of telescope objectives with improved chromatic correction. In the year 1893, Messrs. Cooke and Son, of York, patented a threefold object glass which considerably reduced the secondary spectrum. This construction was invented by Mr. H. Dennis Taylor, who also brought out the Cooke photographic lens. It is well known that by the use of three lenses made of different kinds of glass, three colours of the spectrum can be brought together. This, however, carries with it the necessity for very deep curves and a long focus in proportion to the aperture. Astronomers will recall the Schmidt experiment, which, however, did not lead to any permanent result. By making use of a Schott glass, which has an extremely unusual refractive index, but which does not share the great disadvantage of the specific Jena special glasses, of being sensitive to atmospheric influences, Mr. H. Dennis Taylor succeeded in reducing the secondary spectrum, thus bringing telescope objectives to a high standard of perfection.

A further advance was made a few years ago by the Jena glass works by the production of two kinds of glass, which, especially as regards the physiological part of the spectrum from red to blue, show an almost proportional rate of dispersion, and which, up to the present, have proved to be perfectly durable. In the astronomical department of Messrs. Carl Zeiss, of Jena, under the direction of Dr. Pauly, telescope objectives have been constructed of these new kinds of glass, which give an unusually good colour correction. The superiority of this kind of apochromats was proved by the researches of Professor Wolf, of Heidelberg, respecting object glasses for visual observation and also an f-10 aplanatic lens which was specially constructed by the firm of Carl Zeiss for astrophotographic work, during the time I was on the staff of that firm. It is hoped that the Jena glass works will succeed in constructing even better kinds of glass, so that telescope object glasses may be constructed which have a larger aperture in proportion to their focal length.

I must here refer to one of the most important improvements in telescopes which have been made since the time of Keppler. It is the medial of Professor Schupmann, a combination of a refractor and a reflector which combines the advantages of both constructions, giving an image that is perfectly apochromatic.

With reference to the optical instrument in which we are specially interested, namely the photographic lens, the first to take up the question of correcting the secondary spectrum of a photographic lens appears to have been the English optician, Sutton. When he was going into the construction of his panoramic lens, he thought it might be possible by a careful selection of the glasses used and the liquid enclosed to remove the secondary spectrum. Further consideration of this idea I cannot enter into now, and only mention it on account of its historic interest.

The work of Adolf Steinheil is of greater importance. He went very thoroughly into the design, and especially the selection of the glasses used for his aplanats. These aplanats consist of strong refracting flint glasses, whose quotient and colour dispersion do not much differ. Consequently the disproportion in the degree of dispersion in both glasses does not differ much, and Steinheil saw a considerable advantage in this reduction of the secondary spectrum. Apart from the not very considerable reduction of the secondary spectrum, however, this small advantage could hardly be considered in Steinheil's time. The photographic methods then in use (about thirty years ago) had not developed to the exceptional degree of fineness and precision that they have to-day. The work of the two French mathematicians, Martin and Wallon, remained without any practical results. Both saw the possibility of increasing the efficiency as regards the achromatism for three colours. DR. HANS HARTING.

THE USES OF PHOTOGRAPHY.

[Reprinted from the "Pharmaceutical Journal."]

IT might have been said, a few years ago, that photography was the science that enabled us to reproduce any person, object, or view, either by daylight or artificial light, which was visible to the naked eye; but, to-day, it is possible with the aid of electricity to photograph (as in X-ray work) objects which are invisible to the eye, and by using the telescope and telephotographic lens to photograph the moon and stars, and also views at long distances, while, by the help of the microscope, the actual form and proportions of minute microbes can be photographed in such a manner as to reproduce a more lasting impression and record than could be gained by a hasty glance through a microscope. So it can now be truly said that photography is the science which enables us to reproduce objects which are seen and unseen by the naked eye either by natural or artificial light. We live in a very beautiful world, with the green grass as the carpet of nature, and the blue sea, whether at rest or in motion, like a mirror beneath God's heaven, and each of us, whether great or small, learned or unlearned, can find something of interest, something beautiful which art and nature has scattered around us which will give us pleasure day by day and year by year. So, while we delight in seeking for and finding many historic and beautiful places which lie scattered around us, can it be wondered that we wish to reproduce them by means of photography, and so, in time to come, look upon scenes which gave us joy and happiness in bygone days, and view the forms of friends and relatives since changed—and perchance removed by the unsparing hand of Time? It is not to be wondered, then, that photography has become, perhaps, the most popular of any branch of science, and that the camera has proved itself in the hands of the artist a tool with which he can produce a work of art.

Every one knows that all pictures are not photographs, and it is well that the beginner who practices photography should early realise that all photographs are not pictures. Many people are often heard to say that they took a certain number—perhaps a very large number—of photographs in one day, and it may be they never made the least attempt to produce one picture. It may be well to point out that many photographs are a record of a subject, a mere map as it were; while the technical work, which includes the exposure, development, and printing, may be in every way commendable, it so happens that the photographer has paid little or no attention to the composition of the picture, and has neither arranged the foreground and background as they should be, nor paid the least attention to having the principal object in the picture in the proper place. A good photograph, nowadays, attracts little or no attention, as many people photograph well, but a good picture is always an object of admiration, and can be appreciated by persons, whether they know the subject or not. A careful study of pictures by celebrated artists and prominent photographers will reveal, upon close examination, many points in composition and effect, which will help the thoughtful and painstaking student of photography to utilise the knowledge and art feeling thus gained in the photographs he himself produces. There are many rules for the composition of pictures, some of them to be remembered, some of them to be rejected, and these will be dealt with more fully in another lecture, but enough has been said upon the subject of art in photography to convince you that while a good photograph may please the eye, if it is a good picture in addition it will do more, it will strike deeper and touch those feelings of culture and refinement which are produced by art, and which all true artists possess. So it is of the utmost importance in photographing any subject to remember that it is not merely "What stop shall I use and what exposure shall I give?" but "Have I chosen the best point of view and the most suitable lighting?"

As "one star differs from another star in radiance," so one photographer's result of an exposure on a given subject will vary from the result obtained by another working with the same apparatus and materials under like conditions. Therefore, it becomes evident at once that while the apparatus and materials are tools—as it were—in the hands of the mechanic, the operator himself is enabled—by means of his tools—to stamp his work with that amount of genius, originality, and art feeling with which he may have been blessed, and the student will do well to remember that if he wishes his work to be as good as other students' work, he must take the same pains in producing that work which others take, and by aspiring to produce better work than those who are working around him, he can succeed by taking even more pains in producing his results, being observant of the conditions under which he labours, profiting by the failures of himself and others, learning the cause of failure, and applying his untiring efforts to remove the same. Some persons are blind to their failures: they think everything they produce is perfection—perhaps because they did it themselves—they are blind to failures and defects even when pointed out to them, and, consequently, neither have they been any creditable addition to the ranks of photographers, nor has their work given any

satisfaction or sign of improvement to any one but themselves. However, it would be grossly unfair to blame some photographers because they have never improved in their results obtained, as there are great difficulties, especially in a large country district like our own, under which many beginners labour. The field opened out to the amateur is a wide one. It has many pitfalls. He may be crowned with success one day, and crushed with failure the next. If by any chance he has no one to look to for sympathy, assistance, and guidance, naturally enough his enthusiasm, however keen, will eventually die down, and perhaps be extinguished for ever.

There are so many subjects that the amateur may take up, which are such interesting by-paths of photography, that I have been led—by that enthusiasm in the science which I trust we all possess—to be the sign post, as it were, to direct you to the more attractive paths of photography, where you may, I trust, make a name, and leave a record ever to be remembered by your fellows. Photography of late years has played an important part in our every-day life, and although we are still hoping that in the early future reproduction of colours will be brought nearer perfection than it is at present, it is eminently satisfactory to think that in this age of ours, in which the thirst for education, knowledge, and illustration is one of the principal characteristics of our time, photography has been the means of supplying an ever-increasing demand in the advancement of science, commerce, etc. In astronomy, photography, by means of the telescope, has enabled the astronomer to map out the heavens, and show stars which are too far off to be seen by the naked eye. Lightning has been recorded in its true form, and without an instantaneous shutter. In geology, the formation of the layers of the earth's surface has been portrayed, and records have been taken of mines and minerals deep down in the surface of mother earth, while the aeronaut has been able from his balloon to photograph our mountains, sea coast, large cities, harbours, and fortifications from mid-air.

In medicine, photography now plays its part, and is used with the microscope in photographing the bacilli of different diseases, and it should also be mentioned that the eruption of patients affected with smallpox and other infectious maladies, has been photographed in typical cases to show the ratio of increase and decrease. In surgery—in conjunction with the X-rays—the camera has been the means of determining the position of foreign bodies, such as shot, steel, or iron splinters, needles, buttons, which may have become lodged in the body or limbs of the patient, and it is now possible for a fractured rib or limb to be set by means of the X-rays. Photography plays an important part in legal work, as it is often used as evidence in courts of law, in disputes with regard to ancient lights, rights of way, etc. The use of photography in illustrated literature is so well known that it is hardly required to be mentioned here. There are few industries in which photography cannot be turned to good account. The shipbuilder and the engineer have long recognised the advantage of having photographic records kept of more important work and design, and it would be well to mention in passing that without any exception there is scarcely an industry or business in the land that can not utilise photography either one way or another.

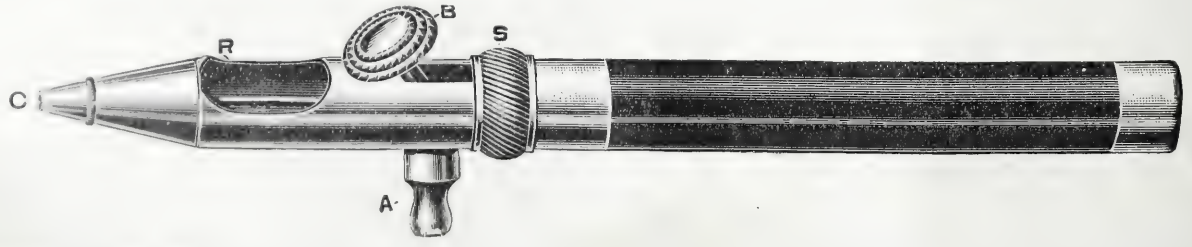
JOHN GIBSON, F.C.S., M.P.S.

Our Editorial Table.

THE AEROGRAPH.

Manufactured by the Aerograph Co., 30, Memorial Hall Buildings, Farringdon-street, E.C.

THE aerograph is probably better known to the majority of photographers as the "air brush," and air-brush finished bromide enlargements are so familiar to every one in business that it is hardly necessary to state that the aerograph is an instrument for applying pigment in the form of paint to paper, canvas, or any other surface. Briefly, it may be summarised as an instrument producing a spray which issues from a minute nozzle, and which can be directed wherever desired. The following description and reference to the illustration will enable the construction of the aerograph to be understood. The illustration represents the handpiece or aerograph proper. R is the receptacle for colour, having a discharge orifice in a finely pointed end, opening within the cap, C. The cap, C, which forms a suction nozzle, has an opening in alignment with the discharge orifice from the colour receptacle for the issue of the spray. The finger button, B, is attached to a lever which has two motions—a downward one to open the air valve, A, and start the action of the tool, and a backward motion which draws back a needle from the discharge orifice, and, according to the distance it is drawn back, allows more or less colour to pass out into the escaping current of air, and be deposited on the paper or canvas. S is a rotating band which, by internal mechanism, limits the motion of the lever, B, and enables the operator to set the tool to supply a uniform quantity of colour. Upon the valve, A, is slipped a flexible india-rubber tube connected with an air reservoir, which in its turn is connected with an air pump so arranged that it may be worked by the foot, a few strokes now and then keeping the air in the reservoir up to the requisite pressure without hindrance to the task in hand. The spray issues from the nozzle in a divergent stream, and it will be easily understood that the closer the instrument is held to the surface of the paper the finer the line that can be made, and the more concentrated the colour; but under no circumstances can a line or a patch of colour be made having an absolutely sharply defined margin. This constitutes one of the features of aerograph work which adapt it so admirably to the finishing of photographs. The delicate gradations of a photograph are extremely difficult to imitate, even approximately, with an ordinary brush and colours, and the utmost skill is required to prevent hand work that is put upon a photograph from showing conspicuously of a different texture from that of the photographic image itself. This difficulty does not occur with the aerograph, and, with a suitable surface to work upon, such as that of a carbon, bromide, or platinotype print, a considerable amount of pigment may be added to the photograph without betraying its presence, even to an expert. It is not only in finishing large work that the aerograph is useful. It may be quite as successfully employed for photographs of cabinet size or even of less dimensions. Indeed, for small platinotype portraits, it would seem almost to be indispensable when the utmost finish is required. Imperfect vignetting may be corrected, backgrounds may be introduced, even errors in lighting may be rectified, and with an expenditure of time which would suffice for hardly more than ordinary spotting with the usual appliances.



SPECIMENS OF BAS-RELIEF PORTRAITS; CHRISTMAS AND NEW YEAR CARDS.

Prepared by the Taber Bas-Relief Photographic Co., 115, Newgate-street, E.C.

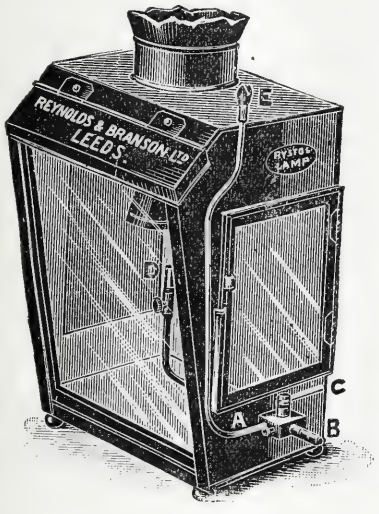
IN the hands of the present company, whose premises are situated in the heart of the City, so that close and ready touch with the wholesale stationery trade is obtainable, the admired process of bas-relief photography associated with the name of Mr. J. W. Taber, of San Francisco, seems to have taken, in the familiar phrase, a new lease of life. If those of our professional readers who are interested in the process will turn to the Taber Company's announcement immediately over the imprint to this number of the JOURNAL the system of business followed will be found outlined. In brief, the company undertake to prepare and mount bas-relief pictures, either from photographers' own negatives or from platinum prints supplied. The mount openings are circular, oblong, panel, etc., and the prices are so calculated as to enable the photographer to place the finished results in the hands of his clients at a reasonable rate. Among the many excellent specimens of the process submitted to us, was a bas-relief of the Grand Duke Alexis, prepared to the special order of a well-known French photographer. Bas-relief photographs of King Edward and Queen Alexandra, from negatives by Messrs. Gunn and Stuart, of Richmond, are also just now attracting great attention. The process is distinctly worth notice and consideration at the hands of those photographers who may be desirous of enlisting the practical support of their sitters for a highly effective system of portraiture. Another

application of the Taber bas-relief process obviously presents itself in the production of Christmas and New Year's cards. By the courtesy of the company a great variety of head, figure, animal, and view subjects in bas-relief have been placed before us, and we readily concede that the process lends itself in a peculiarly effective manner to the production of cards for seasonable purposes at the end of the year. We shall be surprised if, two months hence, sculpturgraph Christmas and New Year cards are not speeding through the post in vast numbers. It may be useful to photographers to learn that their prints are converted into relief photographs and returned within three days.

The Rystos Lamp.

Manufactured and sold by Reynolds and Branson, Leeds.

This is a useful form of lamp for dark-room purposes. The sloping front has three grooves, so that variety as well as combination of illuminants may be obtained. Windows of ruby glass are placed at each side, and the interior has a gas jet controlled externally by the



tap shown at C. A bye-pass is shown at E. The lamp, which is painted white inside, is japanned black outside, and has a metal cowl, not shown in the illustration. We have had a similar lamp in successful use for a considerable time, and can therefore speak from practical experience of the value of the "Rystos."

The "Flashaxe" Candle Flashlight.

Wholesale agents: Fuerst Bros., 17, Philpot-lane, E.C.

A brilliant flash of some seconds' duration is obtained by the ignition of the touch paper at the top of the little candle shown in the annexed illustration. We should imagine that these compact little candle flashlights would be found useful by the amateur taking photographs at home in the evening. They certainly answer their purpose very well. We append the instructions issued by Messrs. Fuerst:—The candle is not dangerous, it burns without noise, does not spurt, and does not



explode. Fix the candle on a fireproof base (its position should be slightly above and at one side of the camera. Light the small tape at top of candle with a match, and after 2-6 seconds the flash commences. It is advisable to affix the candle (especially the large sizes) by means of a drop of stearine to the fireproof base, so as to avoid the candle toppling over during exposure. If the operator wishes to photograph himself he must not fire the tape, but it is recommended to fix to it a piece of touch-paper vertically (about quarter-inch wide). The commencement of the exposure is dependent on the duration of the burning of the touch-paper. When the candle is alight, the whole of the shell burns off, thus giving a very fine and extended source of light (at the back of the candle any sort of white reflector may be placed). The candle must be kept in a dry fireproof place. For interiors, it is recommended that mirrors and very bright objects should be "matted" by rubbing them over with soap, to avoid halation.

Mr. W. Allen, of York-road, Maidenhead, sends for our inspection a specimen of his cheap double dark slides. That which is now before us is for whole plates. It is of book form, and both the material and workmanship are excellent. The finish is, of course, not of that high degree found in the best and most expensive camera work, but it is sufficiently good to satisfy any but the most exacting connoisseur of apparatus. The price of this size is 10s. 6d., and for a dark slide soundly and well constructed, beside being of good appearance, this is remarkably cheap.

Studio Gossip.

Photographing the London School Board.—The London School Board, like other public bodies, evidently like to have themselves photographed, for we see by the report of its meeting last week that "During the meeting, the Chairman announced that the Board were about to be photographed for reproduction in a weekly paper. The picture was taken by flash light. The flash came with a loud and unexpected report and a large volume of smoke. It caused much amusement, and greatly surprised the people in the public gallery above. For a time the room had the appearance of being in a dense fog. It ultimately cleared off, and the meeting proceeded." Of course no one would accuse such an august body as the London School Board of vanity in wishing to see their counterpart presentments in an illustrated paper. The thing was no doubt done in the public interest. But be that as it may, all this sort of thing brings grist to the photographer's mill.

Promiscuous Photography.—The science of photography—it can hardly be justly termed an art as yet—has advanced so rapidly during the past year or two that it bids fair to become (as Mr. Winston Churchill said about the war in South Africa last week) an unmitigated nuisance. Everybody who is nobody is photographed. The illustrated weekly newspapers lack fresh material, writes Guinevere in "The Referee": wherefore any girl who is, as the Americans say, "halfway pretty," can see her counterfeit presentment in print if she chooses to send her photograph to an editor. The result is that every little chorus girl who has been able to buy, or has been given a pretty frock, flies to the photographer. On her way she goes to a hairdresser; a string of imitation pearls can be easily hired from a jeweller, and, lo! when the particular paper to which she has elected to send the resultant picture appears, she is a celebrity; in the eyes of her own folk, at least. People are already becoming weary of this sort of thing; and it is perfectly right that they should. It is very nice to look at pictures of pretty people in the abstract, but at least one-half of the half-tone reproductions of nobodies are not pretty. Mr. Gilbert hit upon the truth prophetically when he said that if every one is somebody—then no one's anybody.

In C. G. Leland's classic treatise on the art and craft of "snooping" we are told that the breeziest types of open-air art critics are to be found among longshoremen. But in the opinion of one of Mr. Whistler's disciples, who has spent the last few weeks wandering up and down London in quest of harmonies and arrangements, there is really not much to choose between the tramps in the parks and the loafers of Deptford and its neighbourhood. The artist in question remembers the days when the fisherfolk of Newlyn and St. Ives discouraged sketching on the Sabbath by means of well-matured fish and double handfuls of sand, and has long since learned to receive the rudest and crudest criticisms of bystanders with a bland smile. But he cannot help thinking that a ragged lounger by the railings in the park, who shouts, "Tuppence a dozen, thirteen to the dozen, an' you teks yer choice!" many times, and ends by throwing his terrible hat at the easel, has slightly exceeded the snooper's right. Much more humane was a riverside critic, whose moon-like face, ruddy with beery benevolence, appeared across "a green sky's minor thirds" on a certain evening down Deptford way. "'Scuse me, sir," said this confidential critic, "but reely you shood not trouble a-rubbin' them clouds in on a week-day. Sun-day, when you got time to spare—that's your day for clouds! I'm no hartist myself, but I've a frien' who his an' makes money at his trade an' has hoften done 'Bubbles' after Millay, an' knows better'n to waste his valyable time. So why waste your (adjective) time, you (adjective) fool!" The recipient of this advice has six unfinished to each single finished study—so ephemeral are the moods of this city of a thousand climates—and wishes it were possible thus to utilise his leisure.

An amusing case of alleged infringement of copyright by the English War Office has recently come to the notice of the "Publishers' Circular," which gives the following account of it:—"It appears that more than two years ago the late Government of the late South African Republic had a special map of the Transvaal prepared by F. and W. Jeppe, from the latest surveys, and printed in six sheets by Wurster,

Randbegger, and Co., of Winterthur. But the map was not published for fear it might fall into the enemy's hands—i.e., into the hands of the British. By some stroke of good fortune our War Office got hold of a copy more than a year ago, and used it very freely in preparing the official 'Map of the Transvaal and Orange Free State.' In 'Petermann's Mitteilungen,' the well-known geographer Habenicht exposes this latest specimen of illegal action on the part of perfidious Albion. He says that, not content with taking this map and enlarging it by photography, although the original was marked 'copyright,' the English War Office have added insult to injury by printing 'all rights reserved' under every section of its pirated copy. This Mr. Habenicht characterises as the 'Gipfel der Unbefangenheit.' It is certainly hard on Kruger and Steyn that their beautiful map should be used to defeat their own people, but it is the fortune of war, and, as Mr. P. Herring points out in the 'Borsenblatt,' to accuse the War Office of infringement of international copyrjght is aiming a little too high, seeing that the late Republics had not joined the Berne Convention. If they had, we fear that their claim to copyright would have ceased to exist when they did. It was smart on the part of the War Office to claim all rights reserved, but we doubt if they would take action against infringements. Even the War Office cannot make a Boer map copyright."

News and Notes.

Messrs. York and Son, of 67, Lancaster-road, Notting-hill, W., have issued their thirty-second annual supplemental catalogue of lantern slides, lecture sets, etc. It extends to 36 pages, and it includes many sets that are calculated to aid in the teaching of geography and history.

Woolwich Photographic Society.—At this Society's meeting, held on the 24th ult., Mr. Nightingale gave a demonstration of "Special Velox Processes," with special reference to post and Christmas cards. He deprecated the use of slip-in mounts as the colours generally were too brilliant. The attendance was much above the average.

On Wednesday evening, October 23, the fourth Traill-Taylor Memorial Lecture was delivered by Professor Silvanus P. Thompson, D.Sc., F.R.S., by the courtesy of the Royal Photographic Society, at the New Gallery, Regent-street. The subject was "Zonal Aberration and its Consequences." Professor Thompson's lecture will be printed in extenso in next week's Journal.

On Thursday, October 24, about 130 members and friends of the Lambeth Carlton Bowling Club met together in the Clarence Rooms, Coldharbour-lane, under the chairmanship of the President, Sir Robert G. C. Mowbray, Bart., M.P. for Brixton, when the annual supper and prize distribution took place. The function was made specially interesting by the presentation of a magnificent epergne to Mr. Lang Sims as a recognition from the club of his seven years' service in the capacity of honorary secretary, a post which he has now relinquished.

We much regret to read in "The Times" of Tuesday last, the following obituary notice:—"Wilmer.—On the 23rd October, from wounds received at Kafirstad, Orange River Colony, on preceding day, Altham Browning Wilmer, Lieut. 2nd Battalion Bedfordshire Regiment, aged 25, eldest son of Horace and Mary Frances Wilmer, of Grove-hill, South Woodford, Essex." Mr. Horace Wilmer was formerly Hon. Secretary of the Royal Photographic Society. We are sure he will have the sympathy of his many photographic friends in his bereavement.

The Southsea Photographic Society's exhibition will be held at the Society's Rooms, Pembroke-road, Portsmouth, on Tuesday, Wednesday, Thursday, Friday and Saturday, December 3, 4, 5, 6 and 7, 1901. There will be 10 open classes, and the awards will consist of gold, silver, and bronze medals, and the Society's diplomas. The judges will be Messrs. H. Snowden Ward, F.R.P.S., A. Debenham, H. T. Lilley, M.A., W. West, H. Symonds. For further information apply to the hon. secretary, Mr. F. J. Mortimer, Cornwall House, Ordnance-row, Portsea, Portsmouth.

At the Rontgen Society's ordinary general meeting, on Thursday, November 7, at 20, Hanover-square, the chair will be taken at 8.30 p.m. The Presidential address will be delivered by Herbert Jackson, Esq., F.C.S. Fixtures:—December 5, Mr. J. Hall Edwards, L.R.C.P., "Bullets and their Billets: Experiences with X rays in South Africa." January 2, 1902, Mr. C. E. S. Phillips—a paper. February 6, Mr. E. W. H. Shenton—a paper. March 6, exhibition evening, probably. August 3, discussion, probably. May 1, Dr. Ch. L. Leonard—a paper. July 3, annual general meeting.

On Tuesday evening, October 22, the members of the general committee of the Photographic Salon were "at home" to their friends at the Dudley Gallery, Egyptian Hall, Piccadilly. The "salon smoker," as this pleasant annual function is generally termed, was attended by a large company of gentlemen prominent in the photographic world. Mr. E. J. Odell and Mr. Reginald Groome were amongst the contributors to the entertainment programme. The Salonists are nothing if not hospitable to their guests, and a delightful evening, varied by music, recitations, refreshments, and last, but not least in appreciation, opportunities for conversation, was terminated by the passing of a hearty vote of thanks to Mr. Reginald W. Craigie, the honorary secretary.

"Beautiful Pictures," Part IV.—"The Dame's School," by T. Webster, R.A., is worthy of a beautiful frame. Barrable's "Foolish Virgins" is a dramatic picture of the five maidens sitting on the steps of St. Paul's Cathedral. Sir Noel Paton's "Quarrel of Oberon and Titania," from "A Midsummer Night's Dream," carries one back to fairyland. Dyckman's "Blind Beggar" is a large print full of human appeal. The Breton peasantry "On the Sands," a group of young nude children with their mother, is a lovely composition. "The Capture of Amynione" (one of the daughters of Danaus) is an exquisite example of Giacomotti's work, and "The Cast Shoe," by Robt. Macbeth, A.R.A., "The Anxious Mother," by Ansdell, are all admirably reproduced, and, at the low price (6d.) at which these reproductions of famous pictures is offered, we think there should be no lack of buyers.

We are sorry to learn of the death of Mr. J. V. Robinson, a former esteemed contributor to this Journal and the Almanac. Mr. Robinson, who was a native of Spalding, Lincolnshire, went to Dublin over 40 years ago, and was for several years engaged in pharmaceutical work, later turning his attention to photography. He, in conjunction with the late Mr. Thomas Millard, was one of the pioneers of photography in Ireland, his experience dating from the days of the old sun pictures or daguerreotype. Since that time he has been closely associated with the art of photography, and was responsible for many of the improvements which have brought this art to such perfection. His improvements in connection with photographic cameras and shutters are well known. Some years ago he constructed a camera capable of taking pictures 5ft. 6in. × 3 ft. 2 in., which at that time was the largest direct photograph that had been attempted. Deceased, who was widely known in scientific circles, was one of the founders of the Photographic Society of Ireland, and for many years a member of the Royal Dublin Society and other scientific bodies taking an active part in their deliberations.

"The Valentine School."—While wishing Mr. Whistler renewed health, there comes into one's mind the meretricious prettiness which is the vogue in modern English society. There are several artists who rely on sham imitations of Gainsborough and Lawrence. Correctness of drawing matters not one whit; it is sufficient to be content with a photographic facial likeness. In the background you shall see an ancestral park; the fair sitter is attired in a nondescript gown of oddly flowing draperies; one of her arms rests lightly upon a stone pedestal. She is generally a duchess. But any photographer would provide you with a composition similarly exact as a likeness at a twentieth part of the cost which the fashionable portrait-painters of to-day exact. It is useless to disguise the fact that we, as a nation, are not excellent in the art of painting portraits. Our one portrait painter who holds the Royal Diploma—for all Royal Academicians hold a signed commission from the reigning Sovereign—is an American. This commission, incidentally, allows the artist to use a cockade, if it so happen that he is sufficiently prosperous as to be able to keep a carriage.—Guinevere in "The Referee."

The Professional Photographers' Association.—Doubtless many of our readers have heard of the Professional Photographers' Association which was formed a short time since under the auspices of our esteemed contemporary The British Journal of Photography, and whose editor, Mr. Thomas Bedding, was elected first President. This Association was caused to see the light of day largely on account of the unfair competition to which the "profession" was subjected by certain firms who made use of photography for the purpose of advertising and extending their businesses. These firms extensively "boomed" an offer of inferior enlargements at slaughter prices to advertise their wares, and succeeded in making the bulk of the photographic profession alive to the danger of their divided condition. Some correspondence thereupon ensued in the photographic press, a meeting was called in London under the presidency of Mr. Bedding, and the Association became an accomplished fact. Although this was only a few months ago there is a membership of over 500, and the Association looks like becoming a powerful factor in matters photographic before it is very much older. Possessed as it is of an influential executive, and with every prospect of a really large membership, there is no doubt that it will be able to accomplish much good for the profession generally, and for the struggling "artist" in particular, by crushing unfair competition, dealing with the vexed question of discounts, and otherwise protecting his interests and those of his customers whenever and wherever possible.—"The Goldsmiths' Institute Journal."

Fatal Poisoning with Bi-chloride of Mercury.—Mr. A. Braxton Hicks, the Mid-Surrey coroner, held an inquiry on Thursday, October 25, at Wandsworth, in reference to the death of Mr. Sidney Charles Wade, 36, private secretary of the Comptroller of the General Post Office, lately residing at Schubert-road, Putney. Mr. George Wade said that his son had lived at home. His son had good health and was most temperate in his habits. During the past week he had a slight cold, but continued at business up to Friday evening. He then had an ulcerated lip, and, exaggerating the matter greatly, was very much depressed. On Saturday evening he went to bed earlier than usual, and stayed in bed on Sunday morning. Witness and his wife went to church, and on returning at a quarter to one o'clock they found Dr. Carter there, and learned that their son had taken poison. Death took place on the following morning. He had no trouble of any kind, and everything was perfectly correct at the General Post Office. He went in for photography, and kept his chemicals on a table in the bath-room, which was on the first floor, his bedroom being on the second floor. To witness his death was altogether inexplicable. Dr. Frederick Heales Carter, of Upper Richmond-road, said he had attended Mr. Sidney Wade for his lip. Mr. Wade was morbidly anxious, thinking it was blood-poisoning. On Sunday witness was summoned, and on being told that Mr. Wade had taken poison he administered an emetic. A 12 oz. bottle of bi-chloride of mercury was found in his room. That drug was largely used in surgery as well as in photography, and Mr. Wade probably knew that it was a good antiseptic.

The bottle contained a saturated solution, which would be about three grains to a teaspoon, while 1-60th part of a grain was a proper dose. Three grains would be sufficient to kill. Mr. Wade seemed exceedingly sorry he had taken the poison, and assisted witness with the stomach pump. When asked why he had taken the poison, he replied, "I must have been mad," and added that he could not think why he took it. Witness firmly believed that Mr. Wade took it for antiseptic purposes, and the fact that he lived so long rendered it difficult to form an estimate as to how much he had swallowed. That he had swallowed some was proved by the fact that salivation had set in, but a small quantity would produce that. The cause of death was exhaustion consequent on salivation, and the irritant effects of bi-chloride of mercury. The bottle was labelled "poison." Mr. Wade was very interested in photography. By the Coroner: He thought Mr. Wade took the bi-chloride of mercury with an idea of killing some poison in his mouth. The Coroner said it was a very interesting case, but the question whether the poison was taken suicidally or accidentally was purely one for the jury. The jury returned a verdict of death from misadventure, and expressed sympathy with the family, in which the Coroner concurred.

Commercial & Legal Intelligence.

We are officially informed that Mr. Auguste Lumière, the well-known photographic expert and chemist, has joined the Board of the Lumière North American Company, which has thereby been considerably strengthened.

Twentieth Century Photographic Company, Limited.—Registered by R. A. Childs, 58. Fairbridge-road, Upper Holloway, N., with a capital of £2000 in £1 shares. Object, to carry on the business of makers of photographic apparatus, cameras, and materials, general storekeepers, etc. Table A mainly applies.

The Morgan Electric Light.—Messrs. O. Sichel and Co. have fitted a complete installation of the Morgan electric light at their showrooms, 20, Berners-street, W., and demonstrations of this light will be given on certain nights. In addition to this the installation can be seen in working order at any time during the day.

City of London Fine Art Association, Limited.—Registered on October 17 by A. A. Archer, 195a, High-street, Kensington, W., with a capital of £5000 in £1 shares. Object, to adopt an agreement between A. A. Archer, of the one part, and the City of London Fine Art Association, of the other part, and to carry on the business of fine art publishers, photographers, fancy stationers, printers, artists' colourmen, dealers in photographic materials, manufacturers, importers, merchants, etc. No initial public issue. A. A. Archer is the managing director. Registered office: 195a, High-street, Kensington, W.

The Statute of Limitations.—At the Nottingham County Court, on October 21, before His Honour Judge Masterman, D.C.L., Samuel Kirk, a photographer, of Pelham-street, Nottingham, sued Isaiah Fisher, accountant, of Ilkeston, for the sum of £4 18s., the value of photographs supplied. Plaintiff said that in September 1895, he went over to Ilkeston on two occasions at the request of the defendant, to take some photographs for him. A week later he sent the defendant proofs of the photographs, and the latter afterwards called and ordered several copies, at the same time sitting for his own portrait. Defendant had not paid, and in September last called at his office, and said if the plaintiff put him into court he should not get a penny, because his property was in the hands of mortgagees. He offered to pay a guinea to settle the matter, but when plaintiff refused to accept it he offered two guineas. Defendant denied that statement, alleging that he said he would rather pay a guinea than spend a day in court, although he did not owe the money. He admitted that the plaintiff came over to Ilkeston and took the photographs, but they were unsatisfactory, and, therefore, he took them back. Plaintiff (re-called) said the photographs produced were not sent back, and they would speak for themselves. Defendant said he did not admit any claim, but if his Honour thought there was one, he would ask leave to plead to the Statute of Limitations. The photographs were taken in April or May, 1895, and not in September. Plaintiff came to photograph a vinery, for one thing, and he never cut his grapes later than July. Plaintiff produced photographs showing late summer flowers in bloom and apple trees with apples on them, which defendant admitted were taken on the occasion in question. His Honour asked plaintiff why he had allowed the matter to stand over so long. Plaintiff replied that he was hoping the defendant would order the other photographs and pay. His Honour: I am afraid you will have to suffer for it. Judgment for defendant, with the costs of the witness.

Patent News.

The following applications for Patents were made between October 14 and October 19, 1901:—

View Meters.—No. 20,568. "Improvements in View Meters for Photographic Cameras." Complete specification. Anthony Heger.

Printing Frames.—No. 20,583. "Improvements in Photographic Printing Frames." Francis Taylor.

Film Cameras.—No. 20,717. "Improvements in Film Cameras." Henry Wood.

Animated Photographs.—No. 20,814. "Improvements in and relating to Apparatus for projecting Living Pictures." Charles Urban and Carl August Teske.

Cameras.—No. 20,902. "Improvements in Photographic Cameras." (Communicated by Harvey B. Carlton.) Complete specification. Oliver Imray.

Cameras.—No. 20,903. "Improvements in Photographic Cameras." (Communicated by Harvey B. Carlton.) Complete specification. Oliver Imray.

Shutters.—No. 20,910. "Improvements in or relating to Focal Plane and other Roller Blind Shutters for Photographic Purposes." Arthur Lewis Adams.

Printing Frames.—No. 20,932. "Improvements relating to Photographic Printing and Vignetting Frames." Sigmund Goldman.

Cameras.—No. 20,938. "Improvement connected with Photographic Cameras." John Weaver Innes.

Printing Frame.—No. 20,943. "Improved Photographic Full-view Printing Frame." Marwood Short.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
4	Camera Club	Demonstration: *Hypax and Cartol Developers.* J. J. Griffin.
4	Oxford Camera Club	*A Walk through the Gas Works.* Mr. Smith.
4	South Manchester	Lantern Slides.
5	Birmingham Photo. Society	*Pinhole Photography.* Dr. L. Morgan.
5	Stonehouse	Business Meeting.
6	Ashton-under-Lyne	Demonstration: *Magnesium Flashlight.* T. Glazebrook.
6	Borough Polytechnic	*A Chat on Instantaneous Photography.* W. Kilbey.
6	Edinburgh Photo. Society	*Fuzz Photography in relation to Pictorial Art.* P. M. Macintyre.
6	Photographic Club	Annual General Meeting.
6	Sutton	Beginners' Evening.
7	Camera Club	*Natural Colour Photography.* E. Sanger Shepherd.
7	Liverpool Amateur	Demonstration: *Carbon Printing.* F. Anyon.
7	London and Provincial	Open Night.
7	North-west London	*Palestine as I saw it.* P. R. Salmon, F.R.P.S.
7	Richmond	Lantern Evening: Members' Slides.
7	Rodley, Farsley, and District	*Development.* J. W. Nicholson.
8	Borough Polytechnic	Instruction Evening: *Bromide Printing by Contact.* G. Fisher.
8	Plymouth	Demonstration: *Bromide Printing.* W. Grist.

ROYAL PHOTOGRAPHIC SOCIETY.

Technical meeting held at the New Gallery, October 22,—the Rev. F. C. Lambert in the chair.

Some Lens Testing Instruments.

Mr. William Taylor, of Leicester, described three instruments used by his firm for testing lenses. Two of the instruments were shown, and a photograph was made to answer for the third. These instruments had been developed and made in connection with the Cooke lens, and, accordingly, the construction of this lens was first shown diagramatically on the screen. One of the instruments was used during the putting together of the parts of the lens. It consisted essentially of a source of light (a small gas jet), and an eye piece, with which the image of the artificially distant spot of light formed by the lens to be tested, is examined, the lens, of course, being placed between the source of light and the eye piece. The chief feature of the instrument was in its general mechanical construction and the convenient and sensitive means for focussing and rotating the lens in several directions.. The next instrument was a photographic camera supplemented by a designed board (the test subject), a number of incandescent lamps, the lens to be tested, and the focussing glass. Mr. Taylor went at some length into the means provided in the Cooke lens for adjusting the negative element enclosed between two positives, and generally, to bring the axes of the several lenses into as perfect coincidence as possible, and the axis of the lens system, as a whole, normal to the shoulder of the lens flange. He showed many slides bearing upon the adjustments that were necessary, and without these diagrams no idea can be given of the method of procedure. Incidentally, the lecturer mentioned that camera construction of the present day was in many cases very weak as regards mechanism for moving the lens, and he expressed the opinion that so long as such was the case it was very doubtful whether the best results would be obtained with the very perfect and sensitive modern lens. The testing camera already alluded to is used suspended by three springs, such as are used by process workers, in order to eliminate chance vibrations. The description of the testing camera showed that every precaution had been taken to ensure accurate relation of parts, and that the system was one upon which every reliance could be placed in attempting to get photographs that

shall be the best that a lens can give. To go a little further, it is an instrument in which the axis of the lens is perfectly normal, and in which the three planes are all accurately parallel. Mr. Taylor next showed a photograph of the test subject or design that had been considered by his firm to be very convenient for the purpose. The structure of the cross hatchings, and the way in which they tried the powers of a lens and exposed its aberrations was gone into at some length. Mr. Taylor next went into the means adopted for testing for linear distortion, first describing, by means of a diagram, what actually happened when a lens had pincushion or other linear distortion. The actual test objects consist of brass tubes about three-quarters of an inch in diameter, with slits, and containing elongated incandescent lamps. The distances of these illuminated slits are first very accurately adjusted, and it is upon the rendering of these that is based the character of the lens. We cannot here go minutely into the details of Mr. Taylor's paper.

Mr. H. Snowden Ward said he had seen these instruments in use, and they struck him as being not only ingenious but as having the best part of ingenuity, which was simplicity and directness in achieving the end in view. As regards camera construction, he said it had often seemed to him that they were unfortunate in having to follow the traditions of men who began work with a couple of cigar boxes. He thought it would be worth while for somebody to go thoroughly into the question of camera construction, and that some of Mr. Taylor's suggestions might be adapted to a more perfect instrument than any we had yet worked with.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 24,—Mr. J. E. Hodd in the chair.

Mr. J. A. Randall showed a novel printing frame, made from a specification in the "Photographic Chronicle," it being so arranged that the print is held to the pressure back by two small clips, and the negative held to the frame by small brass stay blocks, in such a way as to prevent any lateral movement of the plate. The back, with the print attached, is guided into position on the negative by V-shape blocks of brass, the advantage claimed for this frame being that the entire print may be removed and examined and replaced in exact juxtaposition.

The Chairman remarked that although the idea was very ingenious, the expense of making such frames would be very much against it.

Mr. S. J. Beckett remarked that during the use of some matt collodio paper he had noticed that, after toning with gold and platinum, the black colour thus obtained gradually became yellow on exposure to the light, and asked whether any member had found the same thing.

Mr. E. Featherstone queried whether any one present could say anything in favour of the permanence of uranium toned bromide prints, in reply to which Mr. Beckett said he had seen prints toned in uranium go all sorts of colours after a short time. Atmospheric influences also had a detrimental effect on prints toned in this way. However, the tone would last longer if the prints were finally rinsed in water slightly acidulated.

Mr. Thomas remarked that he had a lantern slide that had been toned in uranium, and was for some time a brilliant red, but had now gone a Prussian blue.

Mr. P. R. Salmon showed a series of most effective slides ranging over a period of 15 years, some being from the very first negatives he had made. This interesting series included pictures taken in Greece, Egypt, Palestine, etc. Those of the Holy Land included subjects of the principal places mentioned in Biblical history. Mr. Salmon regretted that, owing to the number of slides, he had not been able to go into the details connected with these subjects more fully, but promised to bring up some of the most interesting ones again in the near future.

The meeting closed with a very hearty vote of thanks to Mr. Salmon, proposed by Mr. Freshwater, and seconded by Mr. Teape.

PHOTOGRAPHIC CLUB.

October 16,—Mr. F. A. Bridge in the chair.

The Rev. J. M. Bacon, M.A., F.R.A.S., gave a very interesting lecture on

Ballooning.

Mr. Bacon has throughout made a considerable use of the camera, and was able to illustrate his lecture with a very complete and instructive set of slides. At the outset he wished to dispel some natural prejudice against ballooning and its utility that existed in the general public mind. He believed that when the meeting saw what he had been able to do from the upper region in the way of investigations in several natural phenomena, they would come round to his way of thinking, and look at the balloon in a very different light to that in which they were accustomed to do so. When he made his first ascent 15 years ago, it was the custom never to disappoint the public, and risks were run that sometimes were of a serious nature. Such was the case when he made his maiden ascent. The course lay over London. The map on the screen very nearly represented what they saw from above, but instead of a field of view limited to a few miles, it extended over an area of some thirty miles or more. There was one thing to be learned by an ascent over London, viz., that it was not crowded with bricks and mortar to the extent that was popularly believed. There was merely a fringe of buildings and innumerable refreshing spots of green, and countless courts and clear spaces of all sizes. During that first ascent he noticed an intolerable noise, as of deranged machinery, arising from London; but, on subsequent trips over the great city, this noise had almost entirely disappeared. Indiarubber tyres accounted for something, but the real reason must be sought for in the replacement of stone paving by wood. The acoustic properties of the atmosphere were very remarkable. The tossing of trees in a gale was rendered a mile aloft like a musical sighing or singing. He had learned from experience that such was not a safe time to leave the earth. He took exception to the application of the term "balloonatics" to those men who had set themselves the task of exploring the aerial world. There was valuable work to be done from the balloon at certain little risks, of course, but if these risks were fairly reckoned with, one did not often get into trouble. The balloon in South Africa had hardly accomplished all that was expected. He thought that more might have been done by making use alternately of the upper and lower currents that were known to exist, and in this way "tack" the balloon across the ground to be covered. He had put this suggestion to actual test by releasing at intervals from a balloon a number of parachutes attached to addressed postcards. He relied upon the inhabitants of the districts covered to post these to him, and from them he was able to plot very exactly the course followed by the balloon. It demonstrated that by rising or descending one could choose a current that was more or less favourable to the course that it was desired to pursue. Mr. Bacon also carried out a number of signalling experiments from a balloon, using a collapsible drum, which was visible for many miles. The Morse code was that used, the long and short strokes being easily counterfeited by the opening and closing of the drum. Fog signals were discharged to attract people, and there was generally some one in a village who understood his messages. Mr. Bacon stated that the effect of a balloon upon the animal world was curious. A dog was very distressed, and bayed as he would at the full moon; a horse would gallop all round a field; a sheep bolted through a hedge; and a jackass became quite animated if time enough were given him. The most excitable animal when balloons were about was man himself. Describing another aerial flight, Mr. Bacon referred to the fact that thunderstorms come up against the wind. Scientists were somewhat loth to accept this statement, but so it was; the balloon was driving along with the wind and met the thunder clouds coming up from the opposite direction. These thunderstorms came up on the higher currents. The next ascent was made with a view to crossing several military camps on Salisbury Plain and getting within signalling distance of them. For this purpose, first the lower and then the upper currents were used, and, as a matter of fact, signals were exchanged with three of the camps by means of the collapsible drum. The heliograph was of little use in balloon signalling. A map was shown indicating the course followed. Mr. Bacon showed a large number of photographs of the earth from above, and others depicting the glories of a sail above the clouds, with the rolling cloud floor beneath. Various ascents were illustrated, including one very long one in search of the Leonids, which almost ended in disaster, the balloon being carried at one time out to sea.

A hearty vote of thanks was passed to Mr. Bacon for his interesting lecture and slides.

October 23,—Mr. J. W. Zaehnsdorf in the chair.

Notices of motion respecting certain suggested alterations of the rules were received and posted on the board. The names of the candidates for committee and offices were also received and posted, in anticipation of the forthcoming annual meeting.

Photographing Polished Surfaces.

Mr. Charles Wallis described the methods he had adopted in photographing polished surfaces, such as those of silver and gold communion services, presentation cups, trays, etc. At the outset he showed on the screen photographs of some polished silver ware made with just the want of care that a beginner might display. There was an excellent reflection of the camera and operator and surroundings that, of course, could not be tolerated. The succeeding slides showed a gradual improvement as various means for the prevention of reflection were adopted. The highly-burnished surfaces of the objects were dulled by dabbing them with putty. Side, front, and top lighting was tried at different times. A large sheet was arranged in front of the camera, the lens projecting through an aperture, in order to exclude any reflection of the camera and objects behind it, with marked success. Many of the trays and bowls had engraved designs, and it was important from the lecturer's point of view that the engraving should be well rendered. The lighting had to be very closely looked after. In one of the slides one side of a tray was in shadow, for instance, and there was some trouble in equalising the illumination. The putty marks also often showed in the photograph, although to the eye the surface seemed quite smooth and even. In photographing engraved surfaces it was advantageous to rub into the lines some rouge, which was easily removed afterwards, and caused no harm. Bowls were more difficult to photograph than flat surfaces. The rouge had to be put on with a shaving brush, and allowed to dry, the surplus being wiped away with cotton wool. The putty was then applied in order to dull the bright parts. If the rouge be rubbed in too heavily, what are called "fire marks" will show, and these come out strongly in the photograph. Gold objects did not require treatment, as a rule, but a background that suited a silver article did not necessarily suit one of gold.

Mr. E. W. Foxlee referred to some photographs of coins that appeared in an illustrated magazine some time ago, and said that they were not done at all from the coins, but from plaster casts tinted with umber, which destroyed the glaring white of the natural plaster.

Mr. Stretton touched upon the use of coloured putty for degrading the brilliant polished surfaces, and recommended certain Italian earth colours which did not affect gold or silver, and did not scratch.

The Chairman thought that a blue putty would not be likely to cause marks in the photographs, due to the putty taking up rouge as the "dabbing" went on, as the blue would counteract the red colour.

A vote of thanks was given to Mr. Wallis for his interesting chat.

Croydon Camera Club.—Lantern Matters.—The meeting on Wednesday, 23rd ult., was a "beginners' night," when Mr. A. E. Isaac explained to those who were novices the art and practice of making lantern slides. Messrs. Wratten, Mees, Rogers, Harpur, and Maclean took part in the subsequent discussion. A display of members' slides followed, and included a number of snap-shots by the President (Mr. Hector Maclean) of racing, diving, tennis, etc. Many of these had received 1-500th of a second or less. They all seemed to be quite fully exposed. The plates used were Ilford extra rapid, the camera Goerz-Anschutz, with focal plane shutter. Mr. Harpur showed some pictorial scenic effects, Mr. Mees some extraordinary electric discharges (the durations of which were said to be but a three-millionth part of a second!), Mr. Ben E. Edwards interesting results obtained by Thomas's colour toning, and Mr. Aldis some mixed subjects. The second "one-man show" of members' prints was displayed on the walls, consisting of a collection of over thirty striking portrait studies of photographic notabilities and others, taken by Mr. W. H. Smith with his oxy-magnesium portrait lamp. Most of the above were taken at the Photographic Convention and at the Croydon Camera Club's fourth exhibition. The collection is a very emphatic affirmation of the unmistakable efficiency and value of Mr. Smith's invention, which no one who practises photography as a livelihood should miss the chance of seeing. The collection can be viewed at any time during the next week or two by applying to the secretary or to any member of the council of the club. Fixture—Wednesday, November 6, Enlarged Negatives, by Messrs. Kough and Rogers.

Woolwich Photographic Society.—The next meeting will take place at St. John's Schools, Wellington-street, on Thursday, November 14, at 8 o'clock, when Mr. Douglas English will give a lantern lecture on "Natural History Photography." All interested in photography are invited to attend.

Birmingham Photographic Society.—The progress and development of the Birmingham Photographic Society has been marked by the taking of new rooms, more commodious, more pleasant, and more conveniently situated than those which have lately been its home. Originally the Society was started in 1856, but after a life of some two decades or more it gradually expired, and from its ashes rose the present successful association, which was formed in the early eighties. The existing Society has had several habitations. The Exchange Rooms and the Colonnade gave it shelter in turn, and for several years the Athletic Institute has been the meeting-place of its members, who—professional and amateur—number about 160. Now it has moved into handsomely-furnished apartments at the Norwich Union Chambers, Congreve-street, where last week assembled a large company for the formal opening by the Lord Mayor (Alderman S. Edwards). Mr. G. F. Lyndon was in the chair as president, and besides the Lord Mayor, there were also present Sir Benjamin Stone, M.P., and Lady Stone, Mrs. Parker-Smith, Mrs. Seymour-Smith, Dr. J. H. Hall-Edwards, Councillors Bowater and Murray, Messrs. E. R. Taylor, A. J. Leeson, W. T. Robinson, R. Haines, T. Taylor, W. S. Aston, H. J. Collins, W. T. Elliott, Bernard Moore, F. Lewis, G. Whitehouse, W. B. Osborn, H. Hendriks, A. McKewan, F. H. Baker, H. Vooght-Cornish (hon. secretary), and others.—The President introduced the Lord Mayor, who forthwith declared the rooms open, and congratulated the Society upon having at last found a convenient location. His lordship alluded to photography as one of the most remarkable of 19th century discoveries, and touched upon its value in medical and surgical diagnosis. It had, he went on to observe, revolutionised several of our industries, and had created a series of industries for itself, and he was gratified to find that many of its earliest and most valuable discoveries were made by Birmingham men. His lordship added that at the London Exhibition now open one-thirteenth of the exhibits for the whole kingdom were from Birmingham. During the last five or six years nearly 350 medals had been awarded to members of this Association, including the gold medal of the Royal Photographic Society for five years in succession.—Sir Benjamin Stone, moving an expression of thanks to the Lord Mayor, urged the members to make the Society what he considered it ought to be—one of the leading associations of the city. Everybody photographed now, and therefore there was a very large constituency of people who wanted authoritative information concerning the art. For those people this Society should be a centre, and he suggested the continuance of elementary classes such as were formerly held, and the extension of the usefulness of the Society by lectures.—Mr. A. J. Leeson having seconded, the vote was warmly accorded, and his lordship made suitable reply.—Responding to a vote of thanks to the visitors, proposed and seconded by Mr. W. S. Aston and Mr. T. W. Robinson, Mr. H. R. Taylor (head master of the Birmingham Municipal School of Art) offered a few suggestive remarks. He indicated the distinction between painters and photographers who were artists, and those who were not. While love or reverence for nature was dominant the painter or photographer remained an artist. When his cleverness was dominant, and his desire to show some of the vagaries and possibilities of technique overpowered his love for nature, art was in danger. Mr. Taylor was afraid the power to appreciate nature—although it was at first in life a gift to every one—was kept dormant by western education, but they might every one of them become artists if they would only learn to see the beauty in a simple scene. Dr. Hall-Edwards afterwards lectured on recent advances in colour photography, describing and showing specimens of the work of Ives, Joly, and Sanger Shepherd, all based on the three-colour theory.

Liverpool Amateur Photographic Association.—Mr. Walter D. Welford was the lecturer before this Society on Thursday last week, his subject being "Pictorial Photography," and Austin Edwards' Films and Warwick plates. He described the purely technical worker as a slave to formula, etc., whereas the earnest pictorial worker made his own laws to suit his own ideas. Halation, influence of grain, faking were also touched upon, and the advantages of the use of chromatic plates clearly demonstrated. The prize slides in the Austin Edwards' Lantern Slide Competition were afterwards passed through the lantern.

FORTHCOMING EXHIBITIONS.

1901.

November 1, 2 ..... Photographic Salon, Dudley Gallery, Egyptian Hall, London, W. Hon. Secretary, Reginald W. Craigie, Dudley Gallery.

" " ..... Royal Photographic Society, New Gallery, Regent-street, London, W. Secretary, 66, Russell-square, London, W.C.

" " ..... Rotherham Photographic Society, Drill Hall, Rotherham. Hon. Secretary, H. C. Hemingway, Tooker-road, Rotherham.

" 6–8 ..... Hackney Photographic Society, Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.

" 23–30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.

Dec. 3–7 ..... Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.

" 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

" 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SOUTHSEA PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITORS.

GENTLEMEN,—Herewith I send you the particulars and entry form of our forthcoming Exhibition, and should be extremely obliged if you could kindly make a note of the particulars therein. This year we hope to make the show a big success again, and you will notice that there are no less than ten open classes, in addition to two extra lantern slide classes, and the awards are on a generous scale, as this year there are special gold and silver medals, in addition to the usual silver and bronze awards; and the open classes should prove very strong, or at least I hope so. All further particulars and entry forms I shall be pleased to supply on application. The members' classes, too, have every indication of being very keenly contested this year, which is a good sign of the renewed vitality of the Society. In these classes, as you see, there is also a gold medal offered by the Mayor of Portsmouth. In fact, there is every good sign of the Southsea Photographic Society becoming one of the strongest in the South. Rule 7 is worth noticing also by exhibitors who intend exhibiting at both Hove and Southsea.—I am, yours, &c.,

F. J. MORTIMER, Hon. Sec.

5, Pembroke-road, Portsmouth.

THE POLYTECHNIC SCHOOL.

To the EDITORS.

GENTLEMEN,—In your issue this week there is a report of or extract from an address given to the students at the Royal Polytechnic Photographic School by Mr. Howard Farmer. I am one of those who have taken your paper for years, with great interest and benefit to myself, and an appreciation of the interest and well-being you always have at heart for the photographer. But the article in question comes with a very saddening influence, which I must reply to. I have taken advantage of the classes at the Polytechnic, and obtained much benefit therefrom, but always thought that the object aimed at there was to obtain excellence first and quickness afterwards. Mr. Howard Farmer appears to suppose that the advertising firms obtain their business by

the promptness with which they return photos. I have reason to believe that the business does not meet their expectations.

We know that copies of a really good portrait can be easily made, but he is speaking to those who are being trained to make these really good portraits, and if he had ever had anything to do with photography as a business he would have met with the experience that retouching cannot be done without. Light your sitter as you will, something has to be altered by retouching. And the idea that portraits can be delivered within twenty-fours hours through the course of a business is simply nonsense, and it is a pity that students should be pushed forward in this slap-dash slovenly mode of business, which is the real cause of the decline of our.

A man who turns out portraits in this style can do them cheaply, but what are they worth? And they tend to make it more difficult for the man who wishes to do justice by his customer to get proper remuneration for his efforts. There is no doubt that the best way to insure success is to turn out the best work you possibly can in a reasonable time, to always supply a finished proof—rough proofs hinder business—whilst finished proofs almost always double the orders. My experience is the good photographer can afford to ignore the copying firms. I have had many applications for permission to send portraits to be copied, and in every case have given consent, with the result that I always get re-orders for my prints. My excuse for troubling you is that those being trained to our profession should get real facts, and be led to the higher ideals, not mere railway, motor-car speed.—I am, yours, &c.,

MAX MILLS.

34, East Park-terrace, Southampton, October 26, 1901.

To the EDITORS.

GENTLEMEN,—Being present at the Polytechnic conversazione last Tuesday week, and hearing your remarks, and also those of Mr. Farmer's, it struck me that you had a great power in your own hands, viz., to help in keeping up the standard and prices of photography by refusing to insert in THE BRITISH JOURNAL OF PHOTOGRAPHY advertisements of enlargements at 10d., 1s., and 1s. 3d., and so on.

There is, to my way of seeing this matter, no reason why these advertisers should not advertise themselves in your JOURNAL, but instead of stating their prices to the general public, as they undoubtedly do, they could and should offer their price lists to professionals on application. I am one who is waiting to join the Professional Photographers' Association as soon as I see this little matter righted.—I am, yours, &c.,

CONSISTENCY.

October 23, 1901.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—I read with great pleasure last week your abstract of Mr. Howard Farmer's address at the opening of the Polytechnic Photographic School, and shall be glad if you will allow me space to add a few words to what is contained in the last paragraph of Mr. Farmer's paper. In this paragraph attention is called to the fact that the P. P. A., as it stands at present, is really the P. P. Masters' Association. I have watched the progress of the formation of the Association with the greatest interest, and it has been a matter of some disappointment to me that, not being an employer, I could not become a member and do my little to assist in furthering so deserving a cause. It may seem natural, at first sight, to argue that employees would not be likely to take the same interest in the Association as their employers would, the interests of the former being less directly concerned; but, allowing that this is so, does it not follow that those workers who would take an interest in what does not so nearly affect them, must be animated by considerable enthusiasm and would therefore be valuable members.

There must be a great number of photographers of long experience who, like myself, cannot claim the privileges of amateurs, and who, unless the rules of the P. P. A. are modified a little, will be debarred from having a voice in matters of the greatest moment to the profession. I trust you will not consider me ungrateful for the great trouble you have taken in the interests of our profession. Mr. Farmer is doubtless right when he points out that it was a wise step to first secure the support of the heads of firms, but I trust that the time is not far distant when the P. P. A. will include all who have a right to be called professional photographers.—I am, yours, &c.,

Edinburgh, October, 1901.

EMPLOYEE.

To the EDITORS.

GENTLEMEN,—At the opening night of the Polytechnic School of Photography several points were raised which are not mentioned in your lengthy abstract of Mr. Farmer's address, but which, nevertheless, are of great importance to the photographic trade, and especially to the photographic assistant. I pass over Mr. Farmer's suggestion re cheap photographs, which opinion, Mr. Editor, you so emphatically combated, with the hope that the newly formed Professional Photographers' Association will use all its moral force to discourage. There are too many cheap (and nasty) photographs already. The point I wish to direct your readers' attention to is the suggestion made that the Association should consider the question of assistants being required to pass an examination to test their qualifications, and the granting of a certificate of efficiency, which, I suppose, the members of the Association would require them to possess before giving them employment. This suggestion raises the whole question of the status of the photographic assistant, who up to the present has made no attempt collectively to insist on any such thing as security of tenure, preferring to make his or her own bargain with the employer, and too often, after being in a berth a short time, which has been described as a "permanency," has been told that the state of trade, etc., did not warrant their being kept on. Thus we have the spectacle of qualified assistants advertising their services in your columns at a "moderate salary" for the winter months, and competing with each other in lowering the rate of wages all round. An efficient assistant has nothing to fear from being required to pass a test of his or her abilities, but, surely, if this is going to be one of the results of the employers combining to look after their own interests, the assistants will see that their interests are not overlooked when this question is up for consideration, but will take steps to place their position clearly and firmly before their employers. Mr. Farmer suggests the possibility of the Professional Photographers' Association allowing assistants to become members of that body, but as there will probably be some diversity of opinion on that question before it is an accomplished fact, I will reserve any remarks until the Association come to any decision, or, at least, until it is considered by them.—I am, yours, &c.,

London.

O. A.

MEASURING THE INTENSITY OF LIGHT.

To the EDITORS.

GENTLEMEN,—By a slip of the pen the word "small" is used instead of "large" in line 7, page 678, in the article on this subject last week.—I am, yours, &c.,

G. WATMOUGH WEBSTER.

"FOR THE GOOD OF PROFESSIONALS."

To the EDITORS.

GENTLEMEN,—Having read "Fettered" and "Unfettered Lances" letters respecting dealers' terms to professionals, may I point out that, since the formation of the ring of plate-makers, etc., I have steadily and regularly purchased my plates and papers from those manufacturers who are not in the ring, and there is in my mind no reason why all professionals could and should not do otherwise.

If, therefore, professionals would make up their minds to purchase from the above-mentioned firms direct, and pay cash, it is more than probable the Plate-makers' Association might see a wee bit of advantage in granting to all bonâ-fide professionals dealers' terms.—I am, yours, &c.,

CRAWSHAW.

October 23, 1901.

PHOTOGRAPHIC SPIES.

To the EDITORS.

GENTLEMEN,—"Tirez les premiers," M. Levy? 'Tis done; your return fire received with equanimity; and yet our Brown Besses may win the day. Take Gibraltar, for instance, well-illustrated from photographs in the "Windsor Magazine" of July last; or the neighbourhood of Woolwich, where the spy mania certainly does not appear rampant. As to photography within the arsenal itself, that stands quite outside the present question. In every country a photographer discovered within the precincts of an arsenal a bien l'air de tirer le diable par la queue!—I am, yours, &c.,

J. DORMER.

October 25, 1901.

THE PHOTOGRAPHY OF MOVING WHEELS.

To the EDITORS.

GENTLEMEN,—In reply to your correspondent, "J. M.," the motion of any point on the circumference of the wheel of a car in motion is the resultant of the velocity of the car as a whole, and of the angular velocity of the point about the centre of the wheel. All points above the horizontal diameter are moving faster, and all points below it are moving slower than the centre. Consequently, if a photograph be taken with a fixed camera, the upper part of the wheel may be blurred, whilst the lower is sharp. But if the camera is carried along upon a car travelling at the same rate as the first car, it is obvious

that there is now no relative motion of the centre of the wheel with respect to the camera. There remains only the motion of the wheel about its centre. Practically, then, the photograph is taken of a wheel revolving uniformly about a fixed centre, and every part of it will be shown as equally sharp.—I am, yours, &c.,

Glenfall-lawn, Cheltenham. CLIFFORD E. F. NASH.

To the EDITORS.

GENTLEMEN,—"J. M.'s" friend asks what would be the effect of the definition on the wheels of a vehicle if taken from another vehicle travelling beside it? The answer is very simple. No difference on the definition of the spokes, but the whole would be sharper.

The blurred effect of the upper spokes of a wheel is often noticed and questioned. The cause is natural, the fulcrum being the ground, and not the hub. Should any one doubt this, lift the vehicle off the ground, spin the wheel, and take a photograph of it. The spokes all round will be equally sharp, the fulcrum being the centre of the wheel.—I am, yours, &c., Y.

THE DISCOUNT QUESTION.

To the EDITORS.

GENTLEMEN,—As regards the Dealer question going on in the JOURNAL, I made application to the Plate and Paper-makers' Association to be put on the dealers' list, enclosing a cutting from a local paper, in which I advertised to supply amateurs, also stating I was as able and willing as any chemist to supply amateurs. They refused. I then sent asking what constituted a "dealer," along with stamped envelope for reply, which they have ignored. I merely sent to see if the absurdity of the position would dawn on them. Now, the Professional Association can alter all this, and justify its existence, by asking the existing firms to supply photographers on the same terms as chemists, and give our support to those who comply with the request. In the event of a refusal, issue shares for a professional manufactory, who will supply chemist and photographer alike. There is a chemist in this town who is a bit of an amateur—or rather was—for he now sells photographs of his own taking. Why should I be handicapped with him? and the fact is I supply more amateurs than he does, as far as I can ascertain. Let the Professional Association act in the same spirit as President Lincoln, when he said, "Write emancipation there, and you can fill in the rest at your leisure." Put the photographer on the same terms as the chemist, and you can fill in the rest at your leisure. Suppose I had taken in the chemist's business, would the chemical manufacturers combine to give me from 15 to 20 per cent. better terms than the chemist because I was a photographer? —I am, yours, &c., FREE COMPETITION.

To the EDITORS.

GENTLEMEN,—At a meeting of Scarborough photographers last week the following resolution was proposed, seconded and carried:—"That this meeting of Scarborough photographers approves the action of the London Committee of the Professional Photographers' Association in seeking to obtain full trade discounts for professionals buying photographic materials from manufacturers and wholesale dealers, and will assist in any concerted action which may be taken with a view to removing the present unfair conditions of purchase."—I am, yours, &c., S. W. FISHER.

To the EDITORS.

GENTLEMEN,—I think the time has arrived when most of the professional photographers of the United Kingdom are of opinion that it would be a good thing if a Society were formed for the manufacture and supply of plates. The necessary capital could be raised from members of the Professional Photographers' Association, who would be invited to take shares; not less than ten £1 shares, and not more than fifty £1 shares, each applicant. If after the first appeal sufficient capital were not forthcoming, then a further offer could be made to those who had already subscribed; but as 200 subscribers at £25 each would mean £5000, this alternative would probably be unnecessary. Professional photographers could then get their plates on fair terms, and those who were members of the Association could share in the profits annually, probably making from 5 to 15 per cent. on their outlay.

If a really good manager of works were obtained, I see no reason why a plate could not be produced to meet every requirement. At present most of us have our particular plate, but are generally agreed that good work can be produced on any of the very excellent plates now on the market. There would be no need to engage travellers to push the goods, as the larger the number of photographers who were shareholders the larger the number who would be customers for the plates. The business could be conducted on the "cash with order" system, thereby ensuring the greatest safety, and offering the best possible discounts. We might then get 25 per cent. discount and carriage paid on £25 orders.

I should have no hesitation in taking fifty shares, but, as already stated, by limiting the number of shares to each individual, would produce the greatest number of shareholders, which would be the strength of the Society, as all shareholders would naturally become supporters of the Society by using its plates.—I am, yours, &c.,

October 21, 1901. EMANCIPATION.

To the EDITORS.

GENTLEMEN,—Doubtless there are many readers of the JOURNAL pleased to see a stir being made in reference to the dealer question. I for one am particularly interested in the various letters, and also in the report in your columns of the doings of our Association in the matter. I have imagined that the various grumbles in print have come from those in a large way of business. I should like to give my experience in a humble way with a humble grumble.

I opened a new business here in '94, and after a short time introduced "supplying amateurs," obtaining dealers' terms from my wholesale agent, he being quite satisfied with the bonâ-fide nature of the venture. During the next three years that part of the business fully justified the step taken. Most of my customers were introduced to photography by me, and what was good enough for me in the way of plates and paper was good enough for them, and so it came about that my stock in that line was not an assorted one.

Then came along the Plate-makers' Association. Presto! begone. We know you not!! and I have to be satisfied with being a dealer in everything else in the list bar paper and plates. Do you call this fair?

One of your correspondents stated that we could get almost the same terms as dealers by ordering £20 worth. Quite right. But it must be £20 worth a month. Should we run out of A——'s special rapid quarters we must wait until a £20 order can again be raised, or order a few to be going on with. At what terms then?

A chemist in a small way of business can order 10s. worth, and get as good terms as those ordering £100 worth, except for the matter of carriage. Then, why cannot a professional in a small way do the dealing business as well as those in a large way?

It was also stated that a large percentage of those granted "the terms" dropped dealing soon afterwards. Whatever use is the Association if it knows this, and is incompetent to prevent or stop it? If there are many who are favoured who should not be, there are also heaps who should be, and are not.

The sooner the suggestion of Mr. G. V. Simmons at the P. P. Association meeting re a co-operative manufacturing business is carried out the better. Possibly, then, these gentlemen will more readily grant their terms; but it will be too late.—I am, yours, &c.,

October 21, 1901. DISGUSTED.

REDUCING THE WHOLE OF THE SILVER IN A PLATE.

To the EDITORS.

GENTLEMEN,—Being one of the two members of the L. and P. whose "miserable attempt" has caused our esteemed friend, Mr. A. L. Henderson, to rush into print, I should feel obliged by your insertion of the following facts. At a recent meeting of the Association I rashly ventured to question whether it were possible to reduce the whole of the silver in a photographic plate. This was scouted by Mr. Henderson, who considered the operation so simple that it needed no proof. He, however, at the following meeting, produced some plates which he had himself developed "through to the back." These same plates were treated by Mr. A. Mackie with a solvent of metallic silver, and the result proved conclusively that Mr. Henderson himself had failed to accomplish this, to his mind, simple feat. Some plates of the same variety were given by Mr. Henderson to the writer for experiment. The following tests were made:—

(1) Full exposure behind a negative showing excessive contrast.
(2) Development with the normal developer for a considerable time.
(3) Washing and subsequent complete reduction of the metallic silver by means of peroxide of cerium.

The result of the excessive exposure and development was to produce, to all appearance, a plate "developed right through to the back." After washing, and the subsequent reduction by peroxide of cerium, however, it was clearly shown that there remained a large proportion of the silver on the plate which had been unaffected by the developer.

These experiments were repeated with largely increased times of exposure and development, and the results obtained were similar, proving, at all events to the satisfaction of the meeting, that even after excessive exposure and development there still remained a large proportion of the silver in the emulsion that was unaffected by either action.

The same experiments were also made on a sample of cristoid film, in which case the developer, acting on both surfaces of the film, should dispel any doubt as to imperfect development. The result in this case coincided exactly with those preceding, and I fail to see any

reason to doubt the accuracy of the results produced. If Mr. Henderson can be induced to give such a "stupid and silly" subject his further attention, he will confer a favour on one whose desire for knowledge is not blunted by the use of extravagant language or derisive epithets.—I am, yours, &c., THOS. K. GRANT.

Wimborne, Lewisham Park, October 18, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED:—

F. Vaughan, 62A, Stafford-road, West Kilburn, N.W. *Photograph of Mr. C. Husk.*

PLATE.—We fancy that the plate was first exposed for the "ghost," but we cannot say for certain as there are so many dodges that may be adopted in taking the so-called "spirit" photographs. We have seen none that we could accept as being genuine.

LENS QUERY.—R. LILE. From an examination of the prints we should suppose that the negatives were taken with the lens well stopped down, say, to f-32. You should have no difficulty in obtaining from any of the leading makers a lens to do such work. The cost for a 5-inch focus instrument will range from three to five pounds.

PERPLEXED.—We should be inclined to attribute the defects to the causes assigned by the makers of the paper, particularly as they have sent you good prints on that you returned. We do not see that you can avoid paying for the paper unless you can prove that it was really bad. If you feel aggrieved you need not deal further with the firm, but get the paper elsewhere.

ADDRESS WANTED.—"POSITIVE" writes: "Can you oblige me with the address of the manufacturers of the mats and preservers for ferrotype pictures (for the beach work), size to fit glass 3×3½; also black and red trays for same?"—In reply: Messrs. Fallowfield, Charing Cross-road, W.C., supply all requisites for the ferrotype process, and will supply the mats and preservers, as well as the trays.

VIGNETTING ENLARGEMENTS.—A. A. K. writes: "I make my enlargements by the use of two cameras, ½-plate and 12×10. Can you tell me the best way to vignette the enlargements? Can the vignetter be fixed inside camera?."—In reply: "Yes, the vignetting mask can be fitted inside the largest camera, but it must be well away from the focus of the lens. The softest vignetting is obtained by moving the mask to and fro during the exposure. But that is not easy to do when it is fitted inside a camera.

DEVELOPMENT, ETC.—J. BROWN writes: "(1) Can the formula given be used for 'gaslight' paper? (2) Will there be any modification for lantern plates? (3) After reading Mr. R. Baskett's method of reduction, I desire to know what is terebene, and where it can be obtained?"—In reply: (1) Yes. (2) No. (3) Terebene may be had from such firms as Hopkin and Williams, Cross-street, Hatton-garden. A commoner kind can, we believe, be obtained from large oil and colour merchants.

A DEFINITION WANTED.—"JUSTICE" writes: "Would you kindly inform me if, when asked to take "a whole-plate photograph" it means the negative as well. I have copied several pictures, etc., for a London publishing firm, no mention of negatives being made, and they now write for the negatives, after I have supplied them with the one silver print off each for block making. In no case have they ordered the negative. Am I not well within my right to refuse same, except on payment extra to the prints sent?"—In reply: The negatives are certainly your property, and must be paid extra for if you part with them.

COPYRIGHT QUERIES.—G. F. writes: "(1) I have a negative of the late Amir of Afghanistan. I wish to sell the negative and copyright. Can you tell me the best way to dispose of it at the best market value. (2) Several weekly and Sunday newspapers have published sketches from the copyright photo of the Amir—some 50 in number. Are these papers liable for taking a sketch, or the agent who supplied the block for the same? (3) In the case of an infringement of the copyright, would the Copyright Union take the matter up for me (I am not a member)? Would be glad for any information you can give me."—In reply: (1) We should recommend you to write to some of the large houses that publish photographs, such as Marion's and similar firms. (2) Both are liable if they infringe your copyright. (3) Yes, if you become a member, which we should advise you to do. Better write to the Secretary of the Photographic Copyright Union, Mr. Henry Gower, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

IMITATION LOUIS SCREENS.—"LOUIS" writes: "Will you kindly inform me, or can any of your readers tell me, if there is an imitation Louis screen made at a reasonable price suitable for a photographic accessory, and where it is to be obtained? The real thing is so very expensive, and, of course, a papier maché or plaster would be just as well for photographing as real carving."—In reply: Probably any of the large dealers who make a speciality of photographic accessories could supply what you require. We should advise you to write to such houses as Houghton's, Marion's, Sichel, and the like.

MARKINGS IN PRINTS.—F. W. T. writes: "I shall esteem it a favour to have your opinion as to cause of yellow markings on enclosed prints. My printer, of course, as usual, wants to teach me, after 25 years' experience, that it is insufficient washing. I say it is hypo got into the water after toning, and before fixing, as he states he saw nothing of them whilst toning."—In reply: The stains are clearly due to the prints not being kept moving while they were in the fixing bath. That is clearly shown by the well-defined marks where the prints have stuck together, so that the hypo has not had free action all over the pictures. One would almost have surmised that, with your experience, you would have seen that at once.

DEVELOPMENT.—H. MOONEY writes: "I have started to use the Imperial Standard Developer pyro-metol, which gives greenish-yellow negatives. The prints that I get from them are very chalky. I shall be glad if you can give me a formula that will take away the greenish-yellow. The reason that I use the above is, because it is quicker in development this cold weather; otherwise, I like pyro-soda, but it takes about 20 minutes to develop one plate."—In reply: If you use the Imperial plates with the developer you should not get stained negatives. Perhaps the plates you have used are not well suited to that developer. Possibly the chalkiness may be due to over-development and under-exposure. If the stain is due to green fog, probably a weak solution of perchloride of iron will remove it; but the plate will require a re-immersion in the fixing bath after its use.

CHARGE FOR VIEWS.—B. C. P. writes: "I have undertaken to take a number of whole-plate views of this district for the publication of a book of views by a chemist. He requires the loan of the negatives for the making of the collotype blocks, after which the negatives shall remain my property. Amongst the quantity he desires the loan of a bird's-eye view which I copyrighted a short time since. This view may not be obtainable again for some considerable time, owing to the mists which prevail in these valleys, which also caused landscape photography somewhat difficult in this district. It also includes several interiors of chapels, etc. I would deem it a favour if you will advise me what would be a fair charge per view. As I am but a young beginner I wish to be fair to my customer as well as myself."—In reply: You can of course make your own terms. The minimum charge, as laid down by the Photographic Copyright Union, for the reproduction of pictures, is ten and sixpence for each subject.

THE ORTOL DEVELOPER.—A. H. HALL writes: "I am going to try the Ortol potash developer. The maker's formula, if I remember rightly, is the same as the one in THE BRITISH JOURNAL ALMANAC, various quantities under the heads of A and B; to develop use half A and half B. I have for some years used only as developer 10 per cent. pyro, 10 per cent. ammonia, 10 per cnt. potass brom. With this I am able to feel my way and to alter the developer according to various requirements. What I want is an Ortol developer on the same lines—10 per cent., if I can have it, or, if not, 5 per cent. or some other equally convenient strength, so that I am able to regulate the strength and character of the developer as development proceeds, without materially adding to the quantity of the solution; or, in other words, I want concentrated solutions of reducer and accelerator added to a large quantity of water to form the developer." In reply: We think you will find it more convenient to employ the developer as given in the formula. You might, however, keep the A solution as it stands, and have the ingredients of B in separate solutions if you think there is any advantage in doing so.

TENANCY REPAIRS.—"GREAVES" writes: "Nine years ago I took some premises as yearly tenant, and in the alterations I made to the premises to make them suitable for photographic business, I removed some matchboarding and papered walls instead. I also painted some dark polished woodwork. Three years ago I sold the business, and the landlord accepted the tenant. Now I have just received a demand for five pounds for damage to polished woodwork, as I painted it; also to replace the matchboard. I shall be glad if you will kindly say if I am responsible. The landlord must have seen the painted work years since, and has never made any objection before."—In reply: This is a query that we cannot give a definite reply to. If you made the alterations without the consent of the landlord, you would be liable to reinstate the premises as you found them. But as the landlord accepted another tenant for them three years ago, and made no demand for them to be reinstated at the time, it may be possible that he has no claim upon you now. However, as we have just said, it is a matter upon which we cannot give a decided opinion.

*** **Many answers to correspondents, reviews, letters, and other communications, are unavoidably held over.**

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EX CATHEDRÂ.

The Special General Meeting of the R.P.S.

The recent address of the President of the Royal Photographic Society, which suggested a number of administrative and other changes for the consideration of the members, will find its sequel on Monday evening next, November 11, when a Special General Meeting will be held at the Society's rooms, No. 66, Russell-square, London, W.C., at eight o'clock, to discuss the proposed alterations. It is to be hoped that there will be a large attendance of members, and that a full and careful consideration of the suggested changes in the constitution of the Society will result. The President's suggestions are given in detail on another page. To our thinking, Mr. Dallmeyer is entitled to the highest praise for affording the members the opportunity of meeting together and discussing the best means of qualifying the Royal Photographic Society, not only to sustain, but to enhance its position as the principal authoritative body of the kind in the world. It must not be forgotten that the President's suggestions have originated with the members, whose ideas he has obviously been at some pains to gather and put in form. At one time or another, and certainly anterior to Mr. Dallmeyer's presidency, it has been urged that it would be advantageous to the Society and British photography if the Fellowship scheme were placed on a more rational basis than at present; and it has also been recommended that the annual exhibition should be judged by members of the Society only. Again, changes in the secretariat have been discussed by some, whilst others have attached great importance to the elimination of nominators' names from the Council balloting paper. If for no other reason, Mr. Dallmeyer's presidency should be memorable for the attempt he is making to turn the light of discussion on questions of reform in which members themselves have shown interest. Monday night's meeting will probably not be entirely conclusive on all points—we should not be surprised to find that it resulted in the appointment of a committee to further consider some of them—but, in any case, we are sure that there will be no misconception of the motive which has guided the President in his action. He will have vastly strengthened and improved the Royal Photographic Society if, as the result of that action, he succeeds in only one of his objects, viz., to raise the status of the fellowship.

* * *

The Oxford Convention.

Last week's meeting of the Convention Council was mainly concerned in winding up the affairs of the Oxford gathering. And a very good wind up indeed it was. The Oxford Executive, thanks to shrewd business management on the part of Mr. Norton and his coadjutors, made a profit of £35 12s. 6d. on the meeting, and this handsome sum goes into the funds of the inviting body, the local Camera Club. The Gloucester Society made a profit of £16 12s. 3d. over the 1899 Convention, so that it is tolerably plain there is no necessity for an inviting society to be out of pocket on the occasion of a Convention meeting—on the contrary, that way profit lies. The Convention balance-sheet shows £108 18s. 3d. in hand, and the snug sum of £200 in Consols also stands to its credit. Thus, with a balance of over £300 on the right side, the financial position of the Convention is extremely

healthy. Messrs. E. Sanger Shepherd and P. R. Salmon were elected to fill two vacancies in the Council, and, once more, Mr. F. A. Bridge was very properly chosen General Hon. Secretary and Treasurer. Year by year it is our pleasant duty to congratulate Mr. Bridge on the continued success of the Convention, of which he is the guiding spirit, but the pleasure increases, rather than diminishes, and on the present occasion it is emphasised by the information we have received that he is to be asked at an early date to accept a tangible recognition of the good work he has so long done on behalf of the P.C.U.K. So ends a very pleasant chapter in Convention annals!

* * *

Poisonous Photographic Chemicals. As we mentioned two or three weeks ago, deaths from poisoning were now of rare occurrence amongst photographers since cyanide of potassium had ceased to be but little used in the art. Some of the developers are certainly poisonous, pyrogallic acid, to wit, but we only remember one case of death from that—then it was swallowed inadvertently. The most deadly poison now in common use in photography is the mercuric chloride—corrosive sublimate—and last week we read of an inquest held on the body of an amateur photographer whose death was caused by swallowing a solution of it. Now, had the whites of two or three eggs, slightly beaten up, been administered at once there is very little doubt that the life would have been saved. That is why we again allude to this subject, because the bi-chloride is very much in use for intensifying negatives, especially amongst amateurs, and the antidote should be impressed on their minds, for it is usually at hand in every household. The bichloride in the solid is not likely to be mistaken for anything else—as oxalic acid, from the similarity of its crystals to those of Epsom salts, may be—but its solution, being colourless, and devoid of odour, may be. It may even be mistaken for pure water. Solutions of cyanide of potassium, by reason of their strong odour, were rarely swallowed inadvertently, but that may not be the case with those of mercuric salts, and, if they are, there is a ready antidote in the whites of eggs, almost always to be had at a moment's notice. As a word of precaution, we would suggest that nothing, on any occasion, should be drunk in the dark room unless it be drawn direct from the tap.

* * *

Care of Reversing Mirrors. In some of the photo-mechanical processes reversed negatives are imperative, and there are different methods of producing them. But the more general way now amongst those who work commercially is to take them, either by means of a reversing mirror placed at an angle of 45° to the lens, or by the aid of a prism fixed in front of the lens. Now, so far as the results are concerned, the one method is as good as the other, provided the mirror and prism are optically equal in quality. But there is a wide difference in price between the two instruments, and this becomes the more pronounced as we approach the larger sizes. For example, a prism, with fittings, about five inches surfaces, costs over £70, whereas a mirror and its fittings, suitable for the same size lenses, costs less than a tenth of that sum, and for this reason it is that the latter is more generally used than the former, at least in this country, amongst commercial workers. There is no question, however, that the prism is the more convenient to employ, inasmuch as it does not require such careful handling as the mirror does, which is easily tarnished, and, moreover, quickly tarnishes if exposed to the atmosphere, particularly that of large towns, where smoke and fogs prevail. However, this is, after all, not a very serious matter, as the glass can be resilvered at a small cost—if the photographer cannot do it himself—when the mirror is as good as new. With care, however, a mirror will last a very long time without requiring to be re-silvered. If by any chance the silvered surface gets scratched, it is of very little moment, as it does not impair its working qualities: it only means a slight loss of light. The tarnishing of the silvered surface, however, is of more serious import, as that entails a more or less longer exposure, according to the amount of tarnish.

* * *

At the present time, when November fogs are prevalent, mirrors quickly tarnish unless they are carefully protected from the air by closing the box directly the exposure has been made; they should also be protected from moisture as much as possible. In this country the mirrors are usually fitted outside the camera. In some houses on the Continent they are fixed inside the camera. Both systems have their advantages and disadvantages. For instance, when they are inside the camera they are, to an extent, secured against atmospheric influences, but, on the other hand, they are more exposed to moisture if the wet collodion process is the one worked, as it is in the majority of cases when reversed negatives are required for the photo-mechanical processes. Just now, with the fogs to be expected during the next two or three months, reflecting mirrors require more care than is necessary during the dry summer months, hence our calling special attention to the subject. A mirror can be easily re-polished with a piece of soft chamois leather and rouge; but the rouge must be of fine quality and free from gritty particles; the leather of the softest. The mirror must be perfectly dry, and, as a precaution before polishing, it should be made quite warm before the fire before proceeding to polish it, for, when moist or damp, the silver is but loosely attached to the glass, and is easily rubbed off. The silvered surfaces of many mirrors have been ruined by attempting to polish them while they are moist, as all the silver has come off. If a mirror has been kept in a room where it is cold, and then brought into a warmer one with a moist atmosphere, moisture will at once become, as dew, condensed upon it, and the silver loosened from the glass. Then, if the attempt be made to polish it, it will be rubbed off. But if the thing be allowed to dry thoroughly, and slowly, it will again become firmly adherent, and, if necessary, may be polished. With care, and the precautions we have indicated, a well-silvered mirror will last for a year or two without re-silvering, even when in constant use.

* * *

The Nernst Lamp. From time to time we have had accounts of the Nernst lamp; but, so far, it has not been a marketable commodity. So much was promised for it, and the promises seemed so likely of fulfilment, that a certain amount of disappointment has been felt that apparently the lamp must have been, after all, impracticable

commercially. It is now seen, however, that such is not the case, that so far from being a dead invention, it is very much alive. The patent rights were acquired by four companies in England, America, Germany, and Austria, respectively. Already it is on sale in Germany, and, as the exhibit at the Glasgow Exhibition shows, the German company are about to introduce it in this country. The cause of the delay has been the time spent in perfecting the practical working of the lamp, which, to distinguish it from the ordinary incandescent type, is known as a "glower." With the familiar incandescent lamp a variation in the voltage of the current, almost unavoidable under the usual conditions, causes a great variation in the intensity of the illumination, an increase in the supply pressure of five per cent., for example, giving an increase of forty per cent. in the candle power; while, in the Nernst lamp, as sent out complete, it is only seven per cent., an increase of efficiency as regards current used, of 26 and 2 per cent., respectively. This variation of the strength of the current in an unregulated Nernst causes great irregularity of action, so that the introduction of a resistance in the circuit that will increase very rapidly with increase of current becomes a necessity. This, after a series of investigations, is found to be best effected by an iron wire nearly at a red heat, and to avoid oxidation it is enclosed and sealed in a small bulb containing an atmosphere of hydrogen, the arrangement being termed "ballast" by the makers. The Nernst is a rival of the arc rather than the incandescent lamp, and, so far, 50-candle is the smallest power made, the highest going up to 2000. The average life on a 220-volt current is said to be 800 to 900 hours, while on a 110-volt it is not higher than about 300, though we may fairly assume this will eventually be improved upon. When it is produced in quantity with those improvements which inevitably flow from experience in manufacture, gained through large demand, we expect great things from the Nernst lamp, which should be the illuminator *par excellence* in photographic practice.

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A Commission on Fogs. Fogs are like the poor, in that they are always with us, though, it must be admitted that, of late years, from some cause or other, they have in the metropolis been far fewer in number and less in intensity. The Meteorological Society, as our readers are probably aware, are taking the subject up, and it seems likely that a real working plan will be carried out. It will be remembered that the Society wrote to the London County Council, asking them to appoint for a limited period (a wise limitation) a gentleman of suitable scientific qualifications to formulate instructions, a scheme of observations, and to carry out the investigations through the means of the Fire Brigade, at their stations. If something to render the atmosphere reasonably clear be the outcome of this movement, no one would be more thankful than the photographer. Meanwhile, seeing the small extent to which the smoke nuisance is mitigated, though the authorities possess such large power, he is more likely to rely on the possibilities of the Nernst lamp.

* * *

The New Star in Perseus. The interest in this astronomical wonder seems to be recrudescing, on account of some recent photographs that have been taken of it. MM. Flammarion and Antoniadi contribute to the French Astronomical Society's "Bulletin" a further article respecting this new star, and illustrate it with drawings and photographs. There is something very remarkable about these pictures, which have given evidence of a mystery so far unsolved. With a photograph of any ordinary object the shape of the diaphragm has no effect upon the shapes of the pictures; but when taking a photograph of what is an actual luminous point like a star, the shape of the image is governed by that of the diaphragm. Some of these pictures referred to have been taken with one half of the lens and this mysterious effect, a representation of a half circle is seen. No satisfactory explanation beyond that of Dr. Max Wolf—and that is not yet accepted—has been given. Dr. Wolf's theory is, that, in addition to the ordinary well-known spectral rays, the new star emits others which are not refracted according to the known laws of optics, and which are the cause of this semi-circular image effect. Dr. Wolf's theory is rendered probable by the fact that the negatives contained a large number of other star pictures; yet the Novi Persei was the only one showing this nebulous effect.

* * *

Loose Photographic Nomenclature. As there are, at the present time, so many photographic printing processes, and, possibly, still more may be to come, will it not be well to describe them under more definite terms than is at present done, so that they may be the better understood by foreigners, and, also, by future historians. For example, if we take the catalogue of the Royal Photographic Exhibition, just closed, we shall find many of the pictures that were shown described as "silver," "bromides," "chlorides," "gelatine," etc. Now, are not all these silver prints? Also, may not all, except the bromides, be equally as well described as chlorides? for, in all of them, the image is printed on chloride of silver. Again, is not a bromide picture as much a silver one as either of those described as silver or chloride? As a matter of fact it is, and more so, inasmuch as the image is composed of silver only, whereas all the others consist of gold as well as silver. By "silver" is generally understood prints made on the old albumen paper, by chlorides, those on collodio chloride paper, and by "P.O.P.," those on gelatino chloride paper; but all are silver pictures, whatever name they are called by. Would it not be better that we should have a more distinctive nomenclature? Why should not those which are in the catalogue termed "silver" be universally called albumen. for they are on albumenised paper; those termed "chlorides" be named collodion, as they are on collodio-chloride paper; and those classed as P.O.P.'s, called gelatine? The term "bromides" can, of course, remain as it is. If this were done, foreigners would have a clear idea as to by what process the pictures were produced, so would future historians.

* * *

The Value of Silver and Photographic Wastes. During last week the price of standard silver was quoted, in the "money market" columns of the daily press, at 26⅜d. per ounce. This, if we are not mistaken, is the lowest price it has, as yet, touched. About four years ago it was quoted at about the same figure. Photographers at the present time are not very much interested in the price of silver, inasmuch as few now have to purchase the nitrate, as the majority of them buy their paper ready sensitised;

and, except those who use the wet collodion process, their plates ready for exposure in the camera. It is only when they have to sell their residues that they become concerned in the price of the metal. Possibly many who see the market prices of silver do not, to the full, realise how low it really is. Silver is dealt with in troy weight, and its nitrate is sold by the avoirdupois weight. Consequently, the ounce of metal means 480 grains, whereas the ounce of nitrate consists only of 437½ grains—a difference of 42½ grains. Many of our younger readers may not be aware of the price that silver was in the early days of the art, when every worker had to purchase the nitrate for the sensitising of his plates and papers. Referring to a file of the "Times" of 1867, we find that standard silver was quoted at 60⅞d. per ounce. It, if we mistake not, was at one time as high as 62d. the ounce. Some twenty years ago its price had receded to about 58½d. per ounce, which, it will be seen, is considerably more than double its present value.

* * *

Residues. Why we specially allude to the subject is that, we are, from time to time, receiving complaints from correspondents about the small returns made by refiners for residues sent to them; and, in some instances, even the honesty of the refiner has been called into question. More often than not the complaints have emanated from photographers of the old school, who have in mind the value they received for their wastes in times past, as compared with what they get now, without in any way taking into consideration the conditions existing then and now. In those days the paper was heavily salted, and was sensitised on silver baths of from sixty to ninety or more grains of nitrate of silver to the ounce of water; and the paper itself was of a very pure kind, and left but little ash when burnt. The same may be said of the filter papers used for filtering the solutions, and the blotting paper upon which the plates were drained, while the residues from the trays over which the plates were developed consisted mostly of metallic silver only. Consequently, when these were dried, with the chloride from the washing waters, and the paper wastes, if saved with care, were completely incinerated, the residue contained from thirty to fifty, or more, per cent. of metal, which, at that time, was worth from four and sixpence to four and tenpence per ounce, and, at an earlier date, a great deal more.

* * *

Now and Then. Now, let us look at the conditions now prevailing as regards the value of residues, omitting the wet collodion process, which is not now worked except to a very limited extent. Gelatine dry plates contain but very little silver. Some brands are said not to contain more than about fifteen grains to the dozen quarter-plates. The ready sensitised albumen papers, also, contain very little free nitrate, and much less chloride than did those of the olden days. Gelatine and collodion papers probably contain still less, and bromide papers none at all. Therefore, as there is so little silver used to begin with, there must be correspondingly less to be recovered from the washing waters and fixing baths. But this is not all. The modern P.O.P.'s have mostly, a baryta coating on the paper, which, in itself, is not of the same pure kind as that necessary for albumenising; consequently, when it is burnt its ash is much heavier; whilst had it been only of the same weight as of old, it would have contained very far less silver, and, on account of its increased bulk, the cost of recovering the metal is correspondingly increased. When these facts are taken into consideration, and also the fact that when the metal has been recovered it is not worth nearly half what it was in former times, it will fully account for the disappointment of some when they receive the cheques for the residues they do from the refiners. It may be mentioned that at the present price of silver, the crown piece, which represents five shillings, is only worth a little over two shillings for the silver it contains, whereas at one time it was worth almost its face value for the metal itself.

ESTIMATING EXPOSURES.

We are not holding a brief for the makers of exposure meters, our remarks tending more in the direction of considering the various factors governing the required adjustment to one another of exposure, plate, and accompanying conditions. We are led to a discussion of the subject from the number of times we have recently been asked to diagnose the cause of failures in negatives by workers who had been successful at other times during the year. In the great majority of cases nothing was wrong except the judgment as to the time required.

The expert photographer needs few hints from us, but when one, whose portrait work is general, and outdoor work occasional, starts to take an outdoor negative at the present time of the year he will very probably go wrong. Leaving, as we say, all meters out of the question, one great cause of incorrect exposures is the practice of working with all kinds and makes of plates. Let a particular brand be chosen, and let it be adhered to through thick and thin, till some special cause leads to its abandonment. There are plenty of good plates by various makers to be had—then much greater certainty will come about. That faculty of judging correctly the time required for all kinds of lights and subjects becomes second nature with most workers of experience; but is quite at fault if continual variation of the brands employed is practised. We have spoken of the time of the year governing the exposure. Experienced photographers are aware of this, and can allow for it; but the extent to which exposures have to be increased in autumn requires much practice and experience before it can be suitably appreciated. The tables published in our Almanacs are valuable, if studied, to show the strictly scientific foundation for the great increase of exposure now needed. There are two factors governing this necessity. In the first place, we have to consider that the sun, at its greatest altitude in November, is very far below what it is in the summer months, and the actual amount falling upon a given spot at one time may be graphically estimated by drawing, say, a line two inches wide on a piece of paper, erecting lines from each end parallel to one another, and at such an angle as represents the sun's altitude. If, then, a line at right angles to the two parallels, and cutting them, be drawn, the length cut off by the lines and squared, will give a fair estimate of the amount of light received. This is a very instructive and simple graphical experiment, and will impress on the mind more forcibly than many other mode

the extent of allowance that must be made on account of the sun's daily increase of distance from the zenith as winter approaches. But this represents a part only of the allowance that has to be made. All photographs are not taken at noon, and very soon we have the sun so low that it traverses a much greater extent of the earth's atmosphere, and so is robbed of a part of its actinism. Then, again, the atmosphere at this time of the year is rarely so clear and free from mists as when warmer weather is experienced, and this further diminishes the amount of actinic light received. When we remember that all these slowing actions are not additive, but multiplicative, it is small wonder that most considerable allowance must be made in the direction of increased duration of exposure. A word may be said here for the benefit of the workers with the wonderfully cheap little cameras that have become so popular, this year in particular, their sale being counted by tens of thousands. Most of the owners merely take snap-shots, and, as so many of them work at an aperture close upon f-16, it is evident that insufficient exposure is probable. For such cameras, snap-shots can now only be taken in brilliant sunshine, and at a time not very distant from noon, before or after. Before dismissing the subject it may be worth while pointing out that, at any season of the year, considerable judgment is needed as regards the atmosphere generally. The extent to which exposures are governed, according to locale, is very marvellous. Any one accustomed to working in the neighbourhood of a big city is surprised when he works in the open country, and finds such reduction in time needed. Similarly, any one accustomed to the country is equally surprised when working at the seaside, the necessary exposure being so much reduced. Almost every one who first attempts seaside work over-exposes his plates, and the same may be said of exposures on board ship. Briefly, before correct estimates of the needful exposure can be made, the factors of the sun's altitude, conditions of atmosphere, and especially proximity to the sea-coast, must always be taken well into consideration.

DEALERS' DISCOUNTS AND PROFESSIONAL PHOTOGRAPHERS.

[From a Correspondent.]

THE proposals with regard to discounts which are being put forward on behalf of professional photographers, practically open up the old question of the relations between production, distribution, and consumption. The fact that any person largely consumes any manufactured article cannot possibly entitle him to a distributor's profit, unless he undertakes the work and risks involved in distribution. It is fallacious to assume that a distributor's function is merely to transmit orders received from a consumer as they come in. A distributor necessarily does far more than this. He provides capital for stock-keeping, he keeps a varied assortment of articles produced by different manufacturers, and gives credit. Out of the margin of profit allowed to him he has to defray the general expenses of distribution, such as rents, travellers, interest on money, and all the outgoings connected with a distributor's business, and most of, if not all of, these expenses are inseparable from distribution, and cannot be escaped by any one undertaking the functions of a distributor, whether he be a producer or a consumer. The suggestion that consumers should combine in order to become their own producers, and so suppress the expenses of distribution, is futile. It is by no means new, and has been tried without success in many branches of business, where production is not so complicated or attended with so many risks as in the case of photographic materials. Some 330 professional photographers are already recognised as dealers by the Association and receive dealers' discounts. If consumption on a large scale were of necessity to entitle a consumer to a distributor's profits it would follow that any amateur who did a large amount of work might claim to receive the distributor's discounts. As matters stand such allowances are denied to him, and he is not allowed the discounts given to the professional photographer. As most of the large buyers are already recognised as dealers, it follows that the proposals put forward on behalf of professional photographers can only apply to such firms as are consumers only, who do none of the work of distribution and are not organized to undertake such work. It is out of the question for a highly skilled professional photographer to think of personally undertaking any of the work of distribution, and if he is to make his purchases in every case direct from a producer, he will have to provide the capital required for stock-keeping, and the staff necessitated by the book-keeping involved by his making small purchases from a number of different firms. If he made any mistakes in his stock-keeping, the loss would be his instead of as now falling upon the distributor, and he would have to provide the room required to keep the stock in, at he could not expect producers to send him chemicals, plates, papers, mounts, frames, and all the various goods he uses carriage paid in small quantities. He would in the end find he was losing instead of gaining by the change.

It must be evident to even the most superficial consideration that all distribution must involve expense. No producer, for instance, who carries on retail business of his own has ever been able to sell to the consumer at the same prices as he would offer to a distributor who takes all the expenses of distribution off his hands. To be logical, professional photographers should make, *a*, their own glass; *b*, their own chemicals; *c*, their own raw paper, and not merely threaten manufacturers of plates, papers, and films with competition unless distributors' profits are conceded to their consuming members. The profits made by distributors are small and in no sense excessive in relation to the work they undertake. The large distributing houses in *all branches* of business invariably and justly make a difference between the margins they allow to sub-distributors (retailers) and the prices they fix for the consumer.

The attack made upon the retailer—notably the chemist—is ill-considered, as it must at once be evident that a retailer whose general expenses are divided up among a wide range of different goods can live on a much smaller margin of profit on any single class of article than a retailer who only deals in a smaller range. No producer of photographic goods could afford to run a retail business at the same margin of profit as would satisfy a large retail chemist or a general store. His general expenses being fixed he would always be at a disadvantage as compared with a house that did a much larger return at very little, if any, greater expense. The suggestion that a purely professional photographer should have his discounts raised to the level of those given to the distributor amounts to this, that he claims to be paid for work which he does not do and has no intention of doing. The moment he really is prepared to undertake the work of distribution, he can obtain recognition as a *dealer* and receive distributor's full discounts. What more can he reasonably claim? The fact that he is carrying on his profession for profit is fully recognised in the discount that he already obtains, and this discount is a liberal one. If a larger discount is to be given to him the producers' margins to distributors will have to be increased, or distributors may refuse to handle photographic goods, and the consequence of such a determination would be to leave the professional photographer to pay all the producers' expenses of distribution. These would inevitably have to be paid, as the goods could not be distributed direct to professional consumers without an additional margin any more than they could be so distributed to the amateur consumer. Such an agitation as the present one is calculated to lead to one serious result—which is perhaps being overlooked—the ultimate refusal of the public to pay full producers' prices, and the consequences of this would be disastrous to the trade as a whole. Seeing that photographic materials are not strictly speaking staple commodities the public could, if they chose, refuse to pay more than a certain price, the supply would probably follow the demand, and the quality of production be impaired to the general disadvantage.

THE ROYAL PHOTOGRAPHIC SOCIETY.

An extraordinary general meeting of the members of the Royal Photographic Society will be held at 66, Russell-square, London, W.C., on Monday, November 11, 1901, at 8 o'clock p.m., in pursuance of a requisition, and at which the appended resolutions will be proposed to be passed with or without modification as special resolutions, with a view to amending the Articles of Association of the Society.

1. To amend Article 4, which reads:—

"For the purposes of registration the number of members of the Society is limited to 1000."

by the substitution of the figure "1500."

2. To substitute for Article 15, which reads:—

"Ordinary members may at any time compound for their future annual subscriptions by the payment of ten guineas, and Fellows by the payment of twenty guineas, if all subscriptions due from them are paid."

the following:—

"Ordinary members may at any time compound for their future annual subscriptions by the payment of ten guineas on election in addition to the entrance fee, and Fellows by the payment of twenty guineas on election, or at any time if their subscription for the previous year be paid, by the payment of ten guineas and twenty guineas respectively."

3. To amend Article 16, which reads:—

"Members residing out of the United Kingdom may be exempt from their annual subscriptions by giving due notice in writing to the Secretary. Such members shall not be entitled during the period of non-payment to any of the benefits or privileges of members."

by the insertion of the words, "for the years following that current," after the word "subscriptions."

4. To amend Article 17, which reads:—

"Every member admitted into the Society shall be considered as belonging thereto, and as such liable to the payment of his annual subscriptions until his name shall have been removed by the Society from their register, or until, having previously paid all arrears, he shall have signified to the Secretary in writing his desire to resign. The payment of the admission fee or subscription shall be considered as distinctly implying the acquiescence of the member in all the rules and regulations of the Society."

by inserting after the word, "resign," the words, "but no candidate, although elected, shall be considered a member of the Society until the prescribed fees are paid."

5. To amend Article 18, which reads:—

"Members whose subscriptions are twelve months in arrear shall not be entitled to attend or take part in the meetings of the Society, nor to receive the Society's printed papers, nor to vote. Any member whose subscriptions are two years in arrear shall be deemed to have forfeited his claim to membership, and his name shall be suspended on the notice board unless the Council give instructions to the contrary. His name may be removed from the register by order of the Council, but he shall, nevertheless, continue liable to pay the arrears of subscription due at the time of his name being so removed."

by the substitution of the words "one year in arrear" for the words "two years in arrear."

6. To amend Article 19, which reads:—

"Subject to Article 18, ordinary members and Fellows shall have the right to be present and vote at all ordinary, technical, and general meetings, and to propose candidates for membership. They shall be entitled to the use of such instruments and books as the Society may possess, to receive the numbers of the Society's "Journal," to free admission to the exhibitions of the Society, and to free tickets for such exhibitions, under such restrictions as the Council may deem necessary. They shall have the privilege of introducing two visitors at the ordinary and technical meetings."

by omitting the words "ordinary, technical, and general"; and by substituting for the words after "visitors," the words "at all meetings other than special general and annual meetings."

7. To substitute for Article 20, which reads:—

"No question shall be discussed or motion be made at the ordinary meetings relative to the direction and management of the concerns of the Society, without such notice having been previously given to the Secretary as shall enable him to bring the matter before the Council."

the following:—

"No question shall be discussed or motion be made relative to the direction and management of the concerns of the Society at other than ordinary and annual general meetings, and then only at ordinary meetings after such notice to the Secretary as shall enable him to bring the matter first before the Council."

8. To substitute for Article 21, which reads:—

"The officers of the Society shall be a President, four Vice-Presidents, a Treasurer, a Secretary, a Librarian, a Solicitor, an Editor of the "Journal," and an Assistant Secretary. All the officers except the Assistant Secretary shall be elected from the members, and all offices shall be honorary except that of the Assistant Secretary."

the following:—

"The officers of the Society shall be a President, four Vice-Presidents, a Treasurer, a Foreign Secretary, a Secretary and Librarian, a Solicitor, and an Editor of the "Journal." All the officers except the Secretary and Librarian shall be elected from the members, and all offices shall be honorary except that of the Secretary and Librarian."

9. To substitute for Article 25, which reads:—

"The Council shall appoint a Secretary, whose duties shall be to attend all meetings of the Society and Council, and to take minutes of the proceedings. He shall conduct the correspondence of the Society. If requested by the authors he shall read the papers presented to the Society. He shall retire annually at the first meeting of the newly elected Council."

the following:—

"The Council shall appoint a Secretary and Librarian, whose duties shall be to attend all meetings of the Society and Council, to conduct the correspondence of the Society, to take charge of the library and other property of the Society, and generally to take instructions from the officers and Council as to the management of its affairs. His appointment shall be made upon such terms as the Council may decide."

10. To delete Article 26, which reads:—

"The Council shall appoint a Librarian, who shall be responsible for the condition and management of the library. He shall retire annually at the first meeting of the newly elected Council."

11. To amend Article 29, which reads:—

"The Council shall consist of the President, four Vice-Presidents, the Treasurer, the Secretary, the Librarian, the Solicitor, the Editor of the "Journal," and twenty ordinary members. At least one-half of those elected on the Council shall be Fellows of the Society."

by substituting for the words "the Secretary, the Librarian," the words "the Foreign Secretary."

12. To amend Article 36, which reads:—

"The election of the officers and Council, other than the officers appointed by the Council, shall be by ballot of all those members of the Society who are entitled to vote. Except the Assistant Secretary, the officers and other members of Council shall retire annnually, and shall be eligible for re-election. Every member of the Society who is entitled to vote shall have the right to nominate one member as President, four members as Vice-Presidents, one member as Treasurer, and twenty members as ordinary members of Council. A notice calling attention to the right of nominating shall be issued to members at least fourteen days before the last day for receiving nominations, either in the "Journal" or otherwise, with a list of the retiring officers, and the number of their attendances at the meetings of the Council and its committees, together with the number of meetings to which they have been called. The Secretary shall inform by letter each nominee of the fact of his nomination and the names of their nominators, and if no reply be received within three days the nomination shall be considered as accepted. No member shall be eligible for nomination to the Council unless he shall have paid his subscription for the previous year."

by substituting for the paragraph "The Secretary shall inform by letter . . . considered as accepted," the following paragraph, "The Secretary shall inform by letter each nominee of the fact of his nomination, and if no reply accepting the nomination be received within three days the nomination shall not be considered as accepted by the nominee."

13. To amend Article 37, which reads:—

"All nominations must be sent to the Secretary not less than twenty-five days before the annual general meeting. A balloting paper containing no names but those of the members nominated and eligible to serve and their nominators, shall be sent to every member of the Society at least seven days before the annual general meeting, with instructions to erase all names of members nominated except those for whom he desires to vote. Every balloting paper shall be invalid on which more than one name as President, four names as Vice-Presidents, one name as Treasurer,

and twenty names as ordinary members of Council are left unerased, or where there is any indication of the identity of the voter. The balloting paper shall be placed in an envelope provided for the purpose, which shall be enclosed in another envelope bearing the voter's signature, and forwarded to reach the Secretary not later than noon of the day preceding the annual general meeting. The Secretary shall place such envelopes unopened in the hands of the scrutineers, who shall reject any papers received except those from members entitled to vote, and shall announce the result of the election before the close of the annual general meeting. If the votes in any case are equal, the Chairman shall give a casting vote. Votes given to any member nominated in two capacities, and not elected to the higher, shall be counted to the next office, but no balloting paper shall be allowed to count as recording more than one vote for any nominee."

by the omission of the words "and their nominators," in the third and fourth lines.

14. To delete Article 41, which reads:—

"There shall be an Assistant Secretary, whose appointment shall be made upon such terms as the Council may decide. He shall discharge such duties as they may direct."

15. To substitute for Article 42, which reads:—

"One or more properly qualified auditors shall be elected at the ordinary meeting of the Society in December. They shall audit the accounts to be produced at the annual general meeting. They shall have power to call for all necessary accounts and vouchers. No member of the Council shall be eligible as an auditor."

the following:—

"The Council shall appoint a chartered accountant or firm of chartered accountants as auditors. The appointment may be an honorary one. They shall audit the accounts to be produced at the annual general meeting, and shall have power to call for all necessary accounts and vouchers. No member of the Council shall be eligible as an auditor."

16. After Article 46, to insert an Article, as follows:—

"Lantern and Elementary Lectures.

"The Council may arrange for Lantern Evenings, and the delivery of elementary courses of lectures at such times and dates as may be most convenient, and which will be announced in the Society's "Journal."

17. To amend Article 53, which reads—

"The Society shall hold exhibitions of photographs, of pictures produced by photography or by any process or processes allied therewith, and of objects connected with photography. The Council shall decide on the regulations for such exhibitions, and shall have the absolute right of refusing any picture or article. If awards be given the judges shall be elected by the members of the Society."

by substituting for the last sentence, the following:—

"If awards be given the judges shall be members of the Society, and shall be elected by the members of the Society."

18. To amend Schedule B, which reads:—

"B.

Royal Photographic Society of Great Britain.

"Sir,—I have the honour to inform you that on the day of , you were elected member of the Royal Photographic Society of Great Britain.

"According to the rules of the Society you are required to pay the sum of £ , being within one month after your receipt of this notice, otherwise your election will be void. These conditions being complied with you will be considered as admitted into the Society, and any publications or notices to which you are entitled will be forwarded according to your directions.

"Under the 15th Article of Association you may compound for future annual subscriptions by the payment of £10 10s., if all subscriptions then due from you are paid.—I am, Sir,"

in accordance with the proposed alteration of Article 15, by substituting for the last paragraph the following:—

"Under the 15th Article of Association you may compound for future annual subscriptions by the payment of £10 10s. in addition to the entrance fee, or at any time if the subscription due the previous year is paid."

KODAK, LIMITED.

The following is an extract from a circular addressed to the shareholders of Kodak, Ltd.:—

"In submitting for your consideration the following proposal, with the reasons for making it, I am desired to remind you that Kodak, Ltd., was incorporated with a capital of £1,600,000, divided into 600,000 Preference shares of £1 each and 1,000,000 Ordinary shares of £1 each, which shares have all been issued, and are fully paid up. Nearly two-thirds of these shares are held in America. Kodak, Ltd., carries on business in England, the Colonies, and other countries (not including America), and owns a very large number of shares in other photographic materials companies carrying on business in America and on the Continent of Europe. The Eastman Kodak Company of America existed long prior to the formation of Kodak, Ltd., which, on its incorporation, acquired a majority interest in that company by the purchase of 98 per cent. of its stock. No change whatever has been made in the management of the Eastman Kodak Company, which remains in American hands; all the business is done in America, and the dividends paid on the shares we acquired are never remitted to this country, but applied on the other side in payment to the American shareholders in Kodak, Ltd., of the dividends declared by Kodak, Ltd. The Income-tax Commissioners have, however, thought fit to assess and charge this company with income-tax on the whole of the profits of the American company, as though it were a mere branch of our business, and in consequence such tax has lately been deducted from the dividends paid in America. The American shareholders regard this imposition as unjust. In effect they say the business of the Eastman Kodak Company is an American business, conducted by an American corporation, the profits are wholly distributed or retained in America, and should not therefore be charged with British income-tax.

"Your directors would be the last to avoid payment of any legitimate impost of this kind; indeed, this company is already charged with double income-tax in respect of its shares in its Continental companies, first by the Government under whose protection the business is carried on, and again by the British Government; but, as in these cases the profits are received and disbursed in England no exception has been taken to the charge; but your directors consider that the above decision places upon the large body of American shareholders affected an undue burthen, which they are satisfied tends to depreciate the value of the company's shares. The question of providing a remedy has become immediate and pressing by reason of the proposed exercise of the option acquired in 1899 to purchase the remaining shares of the General Aristo Company of America, by which exercise that successful enterprise would be entirely absorbed by Kodak, Ltd.; but if this purchase should be completed under existing conditions the income-tax falling upon the American shareholders would be much increased.

"Your directors have for some time past had under consideration proposals for the combination with this company of a number of highly important dry plate and other photographic materials undertakings in Europe and America, by which, it is believed, our already strong position will be greatly strengthened. Terms have been discussed, but no contract has been made with any one of these concerns, nor will any be made without the most careful and searching examination of the accounts and assets. Mr. George Eastman has charge of these negotiations, and his great experience and knowledge, coupled with his large interest in the company, are a sufficient assurance that the interests of shareholders will be in every way safeguarded, and he will be aided in his investigation of accounts by the company's auditors, Messrs. Price, Waterhouse and Co. The further building up of our enterprise under the existing constitution is however practically impossible, in view of the attitude of the authorities in regard to income-tax, and accordingly the directors have been in communication with the representatives of the American shareholders, with the view of devising some satisfactory solution of the difficulty, and as the result a proposal has been made, which the Board has, after mature consideration, decided to recommend to the shareholders for adoption. The prosperity of Kodak, Ltd., has continued unabated, in fact is even greater now than at any former time, and, but for the policy adopted by the Board of building up large reserves, larger dividends might have been paid.

"The progressive character of the businesses of Kodak, Ltd., and the companies at present associated with it will be seen from the following figures:—

PROFITS.

For the year ending 31st December, 1897, as per prospectus of Kodak, Ltd.	£185,232	0	1
For the year ending 31st December, 1898	251,447	8	7
For the year ending 31st December, 1899	335,919	5	7
For the year ending 31st December, 1900	367,039	7	9

The profits for the half-year ending 30th June, 1901, show an increase of £12,013 over the profits of the corresponding period of last year. The profits for 1900, after payment of the Preference dividend, exceeded 30 per cent. on the Ordinary capital. The businesses proposed to be added are well-known prosperous and progressive enterprises. The combined profits of these for the year 1900, after deducting the dividend received on the General Aristo shares (included in the Kodak Associated Companies' accounts as above), amount to £351,000; add profits of the Kodak Associated Companies for 1900 as above stated, £367,039; total, £718,039. After payment of 6 per cent. on the Preference shares and a dividend of 10 per cent. on the common shares of the new company proposed to be issued for the purposes of this scheme, there would be a surplus of about £150,000 for the year,

which, in view of the very large cash reserves already accumulated, should be an amply sufficient provision."

With reference to the foregoing, we are informed that the directors of Kodak, Ltd., have called a meeting of shareholders for consideration of a proposal for the amalgamation of this concern with a number of other well-known kindred undertakings in England and America. More than two-thirds of Kodak shares are already owned in America, and, if the scheme is carried out, an American corporation will acquire the shares of Kodak, Ltd., on the basis of about £2 10s. for the £1 Ordinaries and £1 1s. for the Preferences, payable in corresponding shares of the new company; but members who prefer cash will have an opportunity of taking £2 10s. for their Ordinaries and £1 2s. 6d. for Preferences, approximating to the present prices.

The success of Kodak, Ltd., under the present management is well known, and the same Board will continue to manage the business in England, on the Continent, and in the Colonies. The combination indicated will require over $30,000,000 of capital, but the profits shown will make a very handsome return on this sum. There will be no promoters' profits. Amongst other advantages claimed for the scheme is the broadening of the business, the securing of a wider market for the shares, and the removal of the income-tax trouble, which has given rise to great dissatisfaction amongst the American members. The official announcement of the scheme states that the proposal does not contemplate the raising of prices to consumers; on the contrary, the facilities which the new company will possess will enable it to produce better goods for less money.

THE CITY AND GUILDS EXAMINATION IN PHOTOGRAPHY.

The following is the Examiners' report on the examinations held in May, 1901:—Section A.—In the Honours Grade the general level of the work is in advance of that of 1889 and 1900, though it still leaves much to be desired. There were comparatively few actual failures, but, on the other hand, only one of the candidates did work of sufficient merit to gain a first class. The practical work was a little, but only a little, better than the paper work. The weak point of the candidates in this grade is their want of knowledge of the why and wherefore of the various processes, and of the chemical changes involved. In this respect they were this year inferior to the best candidates in the Ordinary Grade, although they showed, of course, a more extensive knowledge of different processes. The new regulations for the practical work in the Honours Grade certainly afford a better test of a candidate's skill, and seem to meet with the approval of the candidates as a whole. There is reason to believe, however, that the date for sending in specimens of work was not brought to the notice of candidates by their instructors until it was too late to give proper time and attention to the preparation of the specimens. It is to be hoped that more attention will be paid to this point in future. In the Ordinary Grade the work was decidedly in advance of that done in 1899 and 1900, and the papers sent in by the best candidates were highly creditable. In this grade also, however, teachers might with advantage pay more attention to the why and the wherefore, and not restrict themselves so closely to the ordinary routine of processes. Some of the candidates committed absurdities which they would have avoided if they had more clearly understood the rationale of the particular process. In both grades knowledge of photographic optics is still weak, even as regards those fundamental properties of lenses which are important in daily practice. Most of the candidates knew a method of determining the focal length of a lens, but many of them described inconvenient and unnecessarily complicated methods of doing it, and not one of them showed any knowledge of the simple and easy mirror method.

The questions set at the examination were as follows:—

Section A.—Pure Photography.

Eight questions only to be attempted.

1. What changes, if any, take place when the following substances are exposed to air, and how is their value for photographic purposes affected thereby:—Soda crystals, hypo (sodium thiosulphate), carbonate of potash, sulphite of soda, sulphate of iron (ferrous sulphate), alum, ammonium sulpho-cyanide, ammonia solution, potassum bromide? (35 marks.)
2. Describe in detail how you would proceed in printing on gelatino-chloride paper from separate cloud and landscape negatives. (30.)
3. What do you know about the causes of halation? Describe fully the means that you would adopt to prevent it. (35.)
4. It may happen that, although the image appears sharply defined on the ground glass, the developed image on the photographic plate is not sharp. What are the possible causes of this difference, and how would you ascertain to which of them the defect was due? (40.)
5. Describe two methods of reducing gelatino-bromide negatives. Mention any special precautions that are necessary, and state in each case what you know about the chemical reactions that occur. (35.)
6. How would you proceed to make lantern slides by the wet collodion process? Give exact formulæ as far as you can. (40.)
7. What variations would you make in exposure and development when printing on bromide paper from (a) thin flat negatives; and (b) negatives with strong contrasts and excessive density; and why? (30.)
8. Give formulæ for toning baths for prints on albumenised paper, and describe how you would make them up. (35.)
9. What are the advantages and disadvantages for outdoor work of a single photographic lens as compared with a so-called doublet? Describe a simple method of measuring the focal length of a single lens? (40.)
10. Describe the stains most commonly met with on gelatino-bromide negatives, and gelatino-chloride prints (P.O.P.)? Explain their causes as far as you can, and state in which cases they can be removed, and how? (40.)
11. How would you carry out "stand" or prolonged development? What are the advantages and disadvantages of the method? (30.)
12. What do you know about the variations in the photographic intensity of daylight with the time of year and time of day? (35.)

Section B.—Photo-mechanical Processes.

Six questions only to be attempted.

1. Describe the apparatus, camera, lenses, etc., necessary for the production of half-tone and line blocks. (35 marks.)
2. What is the principle of a half-tone negative? State as fully as you can the characteristics of a properly exposed and developed plate. (40.)
3. What "reducers" and "intensifiers" are commonly used in making collodion negatives for half-tone and line blocks? Describe the operations. (40.)
4. What are the qualities of a negative of a line drawing, and how is it made? (35.)
5. Give a description of the process of making a photogravure plate. (50.)
6. State what you know of the methods of printing on metal known as the "bitumen," "albumen," "blue," and "enameline" proceses. (40.)
7. Give an outline of the operations necessary in making blocks for the three-colour process. (40.)
8. How are blocks etched by the line process? Give particulars relating to rollers, inks, acid strengths, etc. (50.)
9. Give details of the process of etching half-tone blocks on copper or zinc. (50.)
10. What is a photo-lithographic transfer, and how is it prepared? (40.)
11. Describe the principles of collotype plate-making and printing. (50.)

Honours Grade.

Section A.—Pure Photography.

Eight questions only to be attempted.

1. Some plates were found to fog during development. State all the different causes that you know of to which the fogging might be due, and explain fully how you would ascertain to which of the causes a particular case of fogging was due. (35 marks.)
2. In a recent German text-book on photography, pyrogallol (pyrogallic acid) is omitted from the developers described. State, as fully as you can, the reasons for and against the adoption of one or more of the newer developers in place of pyrogallol. (35.)
3. If you were required to copy a map exactly one-third of its actual size, (a) what type of lens would you choose for the purpose, and why? (b) How would you measure its focal length? and (c) how would you calculate the proper distance between the map and the lens, and between the lens and the ground glass? (40.)
4. Describe all the methods you know for toning bromide prints. State what chemical changes occur in each case, and say what you know about the probable permanence or otherwise of the results. (40.)
5. What defects are developed in the silver bath for wet plate negatives by continued use? Explain fully their causes, and state how you would remedy the defects. (35.)
6. What methods would you adopt for recovering silver and gold from the residues, wash-waters, etc., in photographic operations? State any differences that you would make in dealing with the different liquids, such as negative fixing bath, wash-water from prints, etc. (40.)
7. What do you know about the proportionate effects of feeble illumination and strong illumination on gelatino-bromide plates? Give the experimental evidence on which your statements are based. (30.)
8. What do you know about the appearance and chemical nature of "green fog," and the causes of its production? How can it be removed? (30.)
9. How would you prepare a collodio-bromide emulsion for lantern slide-making? Give reasons for the various operations. How would you develop the exposed plates? (40.)

10. Describe fully the methods of obtaining by means of iron salts, (a) prints with white lines on blue ground; (b) prints with blue lines on white ground; and (c) black prints, suitable for engineer's drawing. State what chemical reactions occur in each case. (40.)

11. Describe the methods known to you for taking panoramic photographs, and explain the principles on which they are based. (35.)

12. Describe the arrangements necessary for taking a photograph by the X or Röntgen rays. What differences would you make in the arrangements or apparatus when photographing, (a) the hand; and (b) the abdomen? (35.)

SECTION B.—PHOTO-MECHANICAL PROCESSES.

Eight questions only to be attempted.

1. Describe fully, giving formulæ, the process of making half-tone negatives, (a) by the wet collodion process; (b) by the dry plate process. (50 marks.)

2. What precautions are observed in illuminating a dark room used for the development of plates sensitised for the three-colour process? (40.)

3. Describe the methods of preparing negatives for three-colour process blocks, giving details and formulæ. (50.)

4. What kind of lens (giving focal length and diaphragm aperture) should be employed in making trichromatic negatives to scale, i.e., same size, of a group of objects occupying a space of 6 inches from front to back? (40.)

5. Explain the principles of at least two processes of preparing photogravure plates, and describe in detail the working of the carbon process. (50.)

6. What is the working and points of difference in the preparation of negatives for process blocks from, (a) pencil drawings; (b) line drawings; (c) silver prints; (d) bromide prints? (40.)

7. Give a full description of the working of the "enameline" process on copper. (35.)

8. Describe the process of, (a) etching half-tone blocks on copper; (b) etching line blocks on zinc. Give details of the resists used, inks, acid strengths, etc. (50.)

9. How are photo-lithographic transfers prepared? Give particulars of their treatment in transferring to stone. (50.)

10. Describe the principle of collotype printing, and give formulæ for preparing collotype printing plates. (50.)

11. What are the operations in collotype plate printing? How are the plates treated for machine printing? State some of the defects commonly met with and remedies. (40.)

12. Make a rough sketch of a drying oven for collotype plates, and state what is the effect of a high or low temperature in drying the plates. (40.)

13. What is the effect of light upon compounds of gelatine with bichromate salts? State in what respects this light action is made use of in photo-mechanical printing generally. (50.)

HONOURS GRADE.

PRACTICAL EXAMINATION.—SECTION A.—PURE PHOTOGRAPHY.

Candidates are required to carry out the first exercise, and one of the other two.

1. Develop the three plates given to you, and aim at making negatives suitable for general purposes. The plates have been exposed, but not necessarily correctly.

2. Ascertain the focal length of the lenses supplied.

3. Make all the necessary adjustments in the enlarging lantern supplied to produce an enlargement 16 inches long from a negative 4 inches long.

EXHIBITION AT ROTHERHAM.

THE twelfth annual exhibition of the Rotherham Photographic Society was held in the Rotherham Drill Hall from Oct. 29 to Nov. 2, and proved exceedingly attractive. The work was on a much higher level than ever before; the open competitive classes were well represented; the members' contributions showed improvement in selection and technique, and the arrangements for the display were excellent. The three open competition classes were (A) photographs, any subject previously medalled; (B) photographs, any subject, not previously medalled; and (C) lantern slides. Mr. Graystone Bird (Bath), with "The Hours of Rest" (toned bromide), and Mr. A. E. Attfield (Llanelly), "Portrait Study" (platinum), gained silver medals of equal value in Class A. In Class B fully 100 frames were sent in, and they were generally of high merit. Four equal silver medals were awarded, viz., Mr. P. W. Crane (Loughborough), "Bononduz" (platinum); Mr. Chas. E. Wanless (Scarborough), "Running for Shelter" (bromide); Mr. A. W. Cooper (Preston), "Society's Outcast" (carbon); and Mr. Carey (Gloucester), "A Bit of Old Gloucester" (bromide) The lantern slides in C and also in the members' class have not been announced. The members' competitive classes were rather weak in entry. Mr. W. Firth gained the silver medal in D Class (photograph, any subject), with a figure study; Mr. J. C. Cox, the bronze medal, also with a figure study; and Mr. A. S. Lyth, the certificate, with an architectural bit. Photographs of Beverley Minster predominated in the F (or excursion class), each competitor being required to send in four prints. Mr. J. C. Cox carried off the premier medal, and Mr. F. W. Tomlinson the bronze medal. Mr. J. Leadbeater was awarded a special bronze medal for his board of exhibits, amongst which were several fine photographs of the miserere seats in St. Mary's Church, Beverley. A goodly array of members' non-competitive work was to be seen, and help was also forthcoming from the Royal Photographic Society, to which the Rotherham Society is affiliated (part of the loan collection of pictures), Messrs. Wellington and Ward, Messrs. Marion and Co., Kodak, Ltd., Messrs. R. and J. Beck, Ltd., Mr. C. P. Goerz, and Messrs. Elliott. Mr. J. Leadbeater had also on view a new series of frost on window panes. Dr. Baldwin was in the chair at the opening ceremony, which was performed by Miss Mary Egerton, of Terrington, York, herself a very capable photographer, as evidenced by the series of photographs she kindly sent. Lantern shows, music by the Rawmarsh Æolian Quartette, the Eastwood Orchestral Band, etc., were the features of the evenings' programmes. Besides the members' slide projected, Mr. Graystone Bird (Bath), Kodak, Ltd. (war slides), and the Editor of "Photography" (prize slides) contributed. It should be mentioned that the judging was undertaken by Mr. C. Barrow Keene, F.R.P.S., Derby, and Mr. T. A. Scotton, Derby.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

At the committee meeting held on Monday, November 4, the following gentlemen were elected members of the Professional Photographers' Association:—

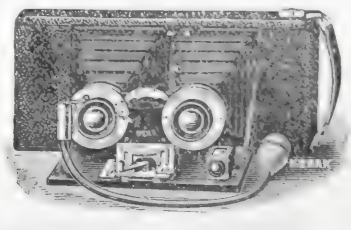
Balmain, James C. H., 69, Shandwick-place and 19, Salisbury-place, Edinburgh.
Boak, Matthew, George-street House, Driffield, and 5, Promenade, Bridlington Quay.
Boxell, Thomas (Boxell and Co.), Valley Bridge-parade, and Victoria-road, Scarborough.
Broad, William Henry, 3, Townwall-street, Dover.
Chancellor, J. W. (Chancellor and Son), 55, Lower Sackville-street, Dublin.
Cromack, Arthur May, 30, Newborough, Scarborough.
D'Arcy, F. P., 90, Grafton-street, Dublin.
Foxton, Frederick, The Studio, Barwick-street, Scarborough.
Latimer, George, 262, Walton-road, Liverpool.
Smith, Stanley O. (Smith Bros.), 18, North Marine-road, Scarborough.
Stead, Edwin, 51, Aberdeen-walk, Scarborough.
Taylor, Edward, 63, Eastborough, Scarborough.
Wakefield, Frank (Wakefield's, Ltd.), 1, High-street, Ealing, W.
Woods, Heslop (Woods and Co.), York-chambers, Westborough, Scarborough.
Woodward, George Pewtress, The Studio, 27, Winchcomb-street, Cheltenham.

Our Editorial Table.

A STEREOSCOPIC KODAK.

Manufactured by Kodak, Limited, 43, Clerkenwell-road, E.C.

MESSRS. Kodak touch one of the soft spots of the Editorial heart by the introduction of the "Stereo Weno" to the British market. The camera has long figured in the advertisement pages of the American magazines, and we are glad to record its appearance here. Somewhere in the JOURNAL, during the last few years, we made the suggestion that if the Kodak Company added a stereoscopic instrument to their series of cameras, the popularity of binocular work



would increase; and now that our first aspiration has been realised, we have little doubt that a great stimulus to stereography will be the result. The first "Stereo Weno" sent to this country lies upon the table at which we are writing this notice. Closed, it only measures 2½ inches by 4½ inches by 10¼ inches, and it weighs about 2 lbs. After considerable experience with the Panoram in the field, we find that the Stereo Weno involves little if any more trouble to hold than the first-named popular instrument. As the illustration shows, the

Stereo Weno is built on the twin-camera principle. It takes the films supplied for the No. 3 F. P. K.; or, in other words, two 3¼×3¼ pictures, equalling a total base line of 6½ inches, are obtained. Two doublet lenses of 5 inches focus, fitted with iris diaphragms, account for the optical part of the system. An indicator points to bulb, instantaneous and time exposures. The shutter is ever set, and, working in the same plane as the lenses, the movement of a lever controlling the irises assures the apertures, which are f-8, 16, 32, 64, and 128, being identical. This is a vital point in such a camera, which we are glad to find so well provided for. A bright finder; an engraved focussing scale, and a tripod screw socket, complete the equipment of a singularly useful stereoscopic hand camera. The lens centres are appreciably over 3 inches apart—a trifle too wide for objects within only a few feet from the camera, but an advantage, perhaps for more distant subjects. To users of the Stereo Weno a manual of instructions is to be issued; and we notice that Messrs. Kodak list a special cutting shape; printing frame; mounts; stereoscopes, etc. The instrument reaches the market at an opportune time, and we hope it will assist in spreading a love for one of the most delightful branches of photographic work, stereography.

The "Wellington" Slow Contact Paper.

Manufactured by Wellington & Ward, Elstree, Herts.

The latest addition to the printing papers issued from the well-known Elstree works is termed, for brevity's sake, the "S. C. P." It is for gaslight development, and is made in two grades—matt and glossy. Specimen prints on both surfaces have been submitted to us, and, in particular, we admire the extreme beauty and delicacy of the results on the glossy paper. We have not seen finer renderings of the more delicate gradations in the half-tones than these prints exhibit. Using a metoquinone developer, we, a few evenings ago, submitted the glossy paper to practical trial in our own dark room, and produced with ease impressions having all the excellent qualities of the sample prints. The papers have evidently been prepared with great care, and, by adhering to the following simple instructions, the photographer should be able to produce the most satisfactory results upon them:—Exposure.—With an average negative, an exposure of one to three minutes at a distance of six inches from an ordinary fish-tail gas burner; or, if an ordinary lamp is used, three minutes should be sufficient; or two to five seconds if daylight is the medium of light employed. Developing.—Place the printed sheet in a clean dish. then flow quickly and evenly over the surface, the developer, as given below. If large sizes are used, it is better to soak the paper for a few seconds before developing. Metol and hydroquinone—metol, 10 grs.; hydroquinone, 30 grs.; sulphite of soda (crys.), 350 grs.; carbonate of soda (crys.), 350 grs.; bromide of potassium, 5 grs.; water, 10 ozs. (This developer keeps indefinitely in well-stoppered bottles.) Dissolve the above in order named. Using the above developer exactly as given, fine blue-black tones may be obtained. If softer results are required, expose the print a little longer, and dilute the developer with a further 10 ozs. of water. Fixing.—When development is considered complete, rinse for a second, and place in the hypo bath, as follows. See that the print is submerged during the process of fixation, which should take about five to ten minutes. Fixing Bath—hyposulphite of soda, 4 ozs.; water, 20 ozs.

The Acme Halation Destroyers issued by Messrs. George Houghton and Son, of 88 and 89, High Holborn, London, W.C., consist of sheets of thin black paper coated with a brownish-red adhesive pigment. The following are the instructions for use:—Moisten the dull or brown side of the destroyers with a sponge or camel's hair brush, apply to centre of glass side of the plate, and pass the squeegee roller over it so that good optical contact occurs between destroyer and glass. The plate can then be placed immediately in the holder, and is ready for use. The plates may be backed at any time and stored in holders or plate boxes, but must be thoroughly dry. The sheet should not be wet—simply dampened. By running a wet sponge over the back of plates before development, the destroyers can be easily removed.

Messrs. Houghton write, with reference to their "Aura" paper:—"We are pleased to say we are once more in a position to execute orders for our 'Aura' Self-Toning Paper, of which we have been without stock for some six or eight weeks. The 'Aura' paper can now be obtained of all dealers throughout the country."

Studio Gossip.

Writing of the tour of the Duke and Duchess of York, the special correspondent of the "Times" says that the Duchess became beloved at once, especially of those who were mothers, by reason of her womanly sympathy, her quick and intelligent interest in everything that came to her notice, her unfailing courtesy, and her sunny smile. Moreover, she enjoyed an accidental but a real advantage from the fact that almost everywhere she had been preceded by a collection of some of the very worst portraits ever produced by photographer or cheap portrait-painter. They were almost all libels of incredible ugliness, particularly those which were intended for use as transparencies at night. Hence came it that when men and women saw her in the flesh they were surprised by her fresh complexion, her bright eyes, her abundant hair, and her elegance of figure.

History, zoology, and physical geography are now taught in London Board Schools by lantern lessons. At the Bath-road Board School, the head-master, Mr. Clarke, has made himself over 2000 lantern slides for this method of instruction. He told an "Evening News" representative recently that for twenty years he had ransacked old bookstalls for lantern material. Most of his slides are suggested by old prints and back numbers of illustrated papers, but his collection includes many valuable photographs contributed by friends and old scholars. Mr. Clarke invited the representative to witness a lantern lesson. At a word of command half a dozen monitors erected the oxy-hydrogen lantern and darkened the schoolroom. The subject was "Australia," and, as the pictures appeared on the screen, the head-master gave a racy account of the rise of the Commonwealth. The scholars evidently appreciated this mode of instruction, and the lecturer's interjected questions were answered correctly.

Burglary at Mr. W. Crooke's Studio, Edinburgh.—A burglary occurred last week in the premises of Mr. W. Crooke, photographer, 103, Princes-street. According to the "Edinburgh Evening News" the burglary is singular in respect that the thieves, while doing considerable damage by the opening of lockfast desks, apparently overlooked the money, which they might have taken away. Some time between the closing of the premises one night and the opening the next morning, the thieves entered apparently from a small window at the back of the premises. They had evidently first begun work in the front saloon overlooking Princes-street. All the lockfast places were broken open. There were two safes in the saloon. One of them contained money; the other did not; the latter was untouched, but the door of the safe with the money was ajar, and the drawers in the inside containing a considerable sum, were left partly drawn out, but nothing was missing. The business desks had all their locks forced, and papers thrown out, but Mr. Crooke has not missed any document; twelve shillings worth of stamps lying in one of the drawers were left untouched. Mr. Crooke has in his premises numerous examples of valuable antique furniture, of which he is a collector, and the majority of the articles have been left untouched. The thieves unfortunately fixed on a magnificent Louis XVI. cylinder bureau, which underwent what is, probably, irreparable damage. Numerous drawers in the cabinet were forced open, and, in doing so, the surrounding woodwork was completely smashed, splinters lying on the floor. There was nothing in this bureau which could be of any value to any one but the owner. Seeing that nothing that an ordinary burglar would have cared to take was removed, Mr. Crooke caused a careful examination of the apparatus on the premises, on the supposition that some photographic crank might have been in search of a good lens. Nothing, however, in that line was found out of place. The only suggestion why the valuables should have been left is the supposition that the thieves were disturbed.

Confessions of a Caricaturist.—This is the title of an excellent article in the November number of the "Strand Magazine," in the course of which the author, Mr. Harry Furniss, tells the following amusing lantern story:—I was showing some serious portraits of Mr. Gladstone in my entertainment, "The Humours of Parliament," and was doing my level best to rouse an appreciative North Country audience to a high pitch of enthusiasm for the man they worshipped so. I was telling them that at one moment he looks like this, and at another moment he looks like that, when I was amazed to hear them go into fits of laughter! In describing Mr. Gladstone I dilate upon him first in a rhetorical vein, and then proceed to caricature my own delineations, and it has always been flattering to me to find that the serious portraits have been received with a grave attention only equalled by the laughter with which the caricatures have been greeted. But not so on this occasion. I spoke of his flashing eye (titters), his noble brow (laughter!), his patriarchal head (roars!), and a mention of his commanding aquiline nose nearly sent them into hysterics! Now, in my lecturing days mishaps may have occurred which were due to some fault of the lantern or operator provided by the society I lectured to; but with the splendid set of lanterns I had made for my entertainment, engineered by the infallible professor who exhibited for me, I never troubled to look round to see if the picture was all right. But for a second it struck me that by some mischance he might be showing the caricatures in place of the serious portraits. Quickly I turned round, and the sight that met my eyes made me at once join in the general roar. There was a gigantic fly promenading on the nasal organ of the Grand Old Man, unheeding the attempts which were being made on its life by the professor, armed with a long pointed weapon. It had walked into the professor's parlour—that is to say, into his lantern—and taken up its temporary residence between the lenses, whence it was magnified a hundredfold on to the screen!

An Australian View of the Oxford Convention.—Viewed from this remote corner of the globe, the gathering of the members of the Sixteenth Annual Convention of the Photographers of the United Kingdom, at Oxford, says the "Australian Photographic Review," was a sight good to behold from a scientific and social point of view. If a man is to be known by the company he keeps, or the books he reads, he should also be judged by the occupation he chooses and his pet hobbies. Ours, undoubtedly, is an intellectual pursuit; and, naturally, draws from the great mass of society natures who love the realms of art and science, and who delight to be occupied in the many interesting and soul-lifting fields our art supplies. It would not be hard to demonstrate beyond controversy that the camera has exercised, and is still exercising, a very

helpful influence on our civilisation, and that the whole world has very largely benefited by the discovery of photography. When we read the reports of such a representative gathering as the one before us—the Oxford Convention—we are thankful for what has been accomplished, and are hopeful for what the future has in store. We are glad to know our art draws its admirers from all classes of the Empire—the King on the Throne, the humble cottager, the high and low, the rich and poor alike find help and pleasure in our domain. Photography recognises no class distinctions; it has no favourites. The Sultan of Morocco, with his diamond-set gold-bound camera, is in no way favoured beyond the humblest member of our camera club. Nature and the camera combine to share their favours on all alike, so far, at all events, as picture-making is concerned. Not only so, but in our company men and women of all shades of religious and political opinions meet, and in a friendly and intelligent manner are free to discuss the photographic problems of the day. During the sitting of the Convention over four hundred members were in attendance, and these were hospitably entertained at a reception given them by the Mayor of Oxford, who, on the occasion, wore court dress, with civic robes. We have before us a picture of the members of the Convention, faithful likenesses of over 200 persons. Every face in this excellent picture is well lighted. We fail to find a single face in any degree obscured. Each individual evidently understood the art of posing. The photograph does great credit to Messrs. Hill and Saunders, of Oxford, and comes to us as a supplement to THE BRITISH JOURNAL OF PHOTOGRAPHY.

THE new Slade Professor on "Art and Joy."—On Monday, November 4, Sir William Martin Conway delivered his inaugural lecture as the Slade Professor of Fine Art in the University of Cambridge at the Museum of Classical Archæology. He said it would be idle for him to pretend that in undertaking the duties of Slade Professor he was without misgiving. It was exactly ten years since the study of art-history ceased to be the main preoccupation of his life, and was exchanged for the engrossing cares and excitements of a more active career. He could not, therefore, stand before them clothed in the panoply of complete knowledge of the latest discoveries in art-history or the finest nuances of recent art criticism; but art was wide as life itself, and whoso had once given himself to her never escaped her sweet enthralment. Joy in life, that was what originated art; that was the end which it served. Where there was joy art must assuredly arise; in the life of action as in the life of contemplation, amongst the humble as amongst the rich, in the backward as in the most advanced races of mankind. It was only in the miserable dregs and equally miserable froth of humanity that art was unknown. Art might be defined as the manner in which a material was used for the production of beauty. The material might be language, or the movements of the body, or sound, or life itself, as well as stone, or plaster, or paint, or ink and paper. In the moulding of all these things art might arise, so that there lived no human being, how poor soever, who might not beautify his life by art. Whatever was done for the sake of giving pleasure to some one else belonged to the category of art. That which a man did solely to please himself was not art. Herein lay the distinction between art and sport. Art was not the mere exercise of skill, but it was the exercise of skill to a definite end, and that end was, in the strictest sense of the word, pleasure. He that could find beauty anywhere in the wide world of nature or man had the root of the artistic disposition within him, though the technical skill to realise it might be absent. He to whom any work of art had ever appealed, awakening in him the unmistakable thrill of joy, had the capacity of artistic recipience, which time, opportunity, and will were only needed to develop. When once the emotion of beauty had been quickened in a man he would enjoy a similar experience better next time; then one less similar. His delight would be spread over a whole category of experiences, and thus he would become receptive to one form of art. The two human faculties which a work of art implied, the creative and the receptive, were thus both capable of development. Where the faculty existed it could be developed. The conviction that this was so was shown by the multitude of art schools wherewith civilised countries were now provided. But it was a remarkable fact that the perceptive faculty received hardly any attention at the hands of educationists. Governments and municipalities would spend money enough on making artists, who, when made, would be unable to live unless each of them could find a considerable body of amateurs to buy his work. Yet the Governments and municipalities which subsidised art schools were by no means correspondingly intent on developing the perceptive faculty in the purchasing public. They would hold an occasional exhibition, and even, perhaps, form a permanent gallery of paintings, as though pictures were the only art; whilst in the incompetent planning of new streets and erection of public monuments and buildings, in the obliteration of open spaces, the destruction of scenes of natural beauty, and such other perverse object-lessons, they more than counteracted the educational effect of their vaunted exhibitions. Another social habit of ours that must blight nascent popular taste was the habit of confiding to committees of more or less eminent gentlemen the ordering of local or national monuments. In matters of taste committees were anathema. All that a committee had any power to do efficiently was to choose an artist for the work in hand, and then to let him to it. Utterly detestable, too, were so-called competitions, when a selected or an unlimited number of artists were invited to submit designs. The great need, from the point of view of the production of fine art, was the education of the amateur, the purchaser. How was this to be accomplished? That was the problem that faced each occupant of the Slade chairs in the Universities of Oxford and Cambridge; for to answer that question was the end for which they were founded. It was not his function—Heaven be praised—to prepare any one for that vile modern ordeal, an examination. It was his duty to tell them that art was a necessary part of healthy human life, that there was nothing effeminate about it, nothing unhealthy, nothing ignoble. All art was based on joy, and the man who had developed in himself this gift of joy was not thereby rendered less manly, less fit for the life of action, less apt to noble deeds; rather was he the manlier man to whom the treasure-houses of life opened at his coming, and for whom mankind and the world of nature had been made so fair.

News and Notes.

THE Hove Camera Club Exhibition.—The entries for this exhibition close on November 12, to Mr. A. R. Sargeant, Hon. Sec., 55, The Drive, Hove.

ROYAL Photographic Society.—Ordinary meeting, Tuesday, November 12, at 8 p.m., at 66, Russell-square. Mr. Douglas English, B.A., will read a paper on "Photography as an aid to the Naturalist."

SIR H. Trueman Wood will deliver the next Christmas Juvenile Lectures at the Society of Arts, the subject being "Photography and its Applications." The idea will be to show in what a large number of cases photography has been applied to scientific observation, and how varied are the applications. The dates of the lectures are January 1 and 8.

THE Stonehouse Camera Club's annual exhibition will be held in the Kent Unity Hall, Edgcumbe-street, Stonehouse, on the 3rd and 4th December, 1901. The Judges are Messrs. W. D. Snell, H. Fitch, and J. Trouern Trend, and the Secretary is Mr. S. H. Paynter, 3, Union-street, Stonehouse.

LEICESTER Literary and Philosophical Society. Section 6 (Photography).—A meeting of the above Society was held in the Council Room, Town Museum, Princess-street, on Friday last, when a lecture was delivered by Mr. Parritt, entitled, "A Gossip on Flower and Tree Photography," which was illustrated by prints and lantern slides. There was a record attendance of members, who thoroughly appreciated the lecture.

CRIPPLEGATE Photographic Exhibition.—The Cripplegate Photographic Society will hold its annual exhibition on February 25, 26, and 27, 1902, at the Cripplegate Institute. The Right Hon. the Lord Mayor, Sir Joseph C. Dimsdale, M.P., has kindly consented to open the exhibition on Tuesday, February 25. There will be seven open classes, in which 15 gold, silver, and bronze medals are offered for competition. Applications for entry forms, and other information, to be addressed to the Hon. Sec., Mr. Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C.

"THE Stockkeeper," published at 77, Fleet-street, E.C., contained the following announcement in a recent issue:—The perfection to which cameras have now been brought, and the facilities which are placed at the disposal of amateurs to develop their plates and print the photographs, have made photography a most fashionable pastime. Many fanciers have taken it up, and, to give them an opportunity of friendly rivalry in their efforts, and also encourage the photographic portraiture of dogs, we have arranged an Amateur Photographic Competition in connection with the "Stockkeeper" Christmas Art Supplement, which will again be published with our Christmas Number. To enable a large number of fanciers to participate in this competition, we have made the conditions as little stringent as possible. The principal rule is that only amateur photographers can compete, and professionals will be excluded. The Christmas Supplement will, the same as last year, be published on art paper, and most carefully printed, which will ensure full justice being done to the work of the successful competitors, whose photographs will be reproduced. There will be no entry fee, and the following chief prizes will be awarded:—First, £2 2s.; second, £1 1s.; and four prizes of 10s. 6d. each. In addition to these, specials for the best photographs of specified breeds will be offered, and shortly announced.

PROFESSOR Silvanus P. Thompson.—Our contemporary, the "British Optical Journal," in its November issue publishes the following biographical notice of this year's Traill Taylor Memorial Lecturer:—Born at York in 1851, Professor Thompson early showed an inclination for science, and used every opportunity to become proficient in this branch of learning. He was educated at the Friends' school in the old cathedral city, where he afterwards became science master. He was also a student at the Founders' College, and, when eighteen years of age, graduated B.A. of the University of London. Having a preference for chemistry and physics, he afterwards abandoned the position he held as science master at the school in York, and attended the lectures on these subjects at the Royal School of Mines, making, at the same time, several visits to Heidelberg and other foreign Universities. In 1875 Professor Thompson obtained the degree of B.Sc. of the University of London, being bracketed first in honours. Three years later he graduated D.Sc., in the department of Experimental Physics. In the same year he was appointed Professor of Physics at the University College of Bristol, where he had for some time previously been giving lectures in Physics under the Gilchrist Educational Trust. In 1885 Professor Thompson was elected as Principal of the City and Guilds of London Technical College, Finsbury, a position which he holds at the present time. He also occupies the Chair of Physics at the same institution. In the scientific world he has made several discoveries. The illusion called "Strobic circles" was his discovery. He also applied the Clerk Maxwell's electromagnetic theory of light to the explanation of the behaviour of tourmaline crystals in their action upon polarised light. When occupied with this investigation he proved that the displacements in a wave of light are perpendicular to the plane of polarisation. Whilst speaking of this subject, we might also mention that Professor Thompson invented a modification of the Nicol prism, which bears his name, and which is used, not only in this country, but also largely on the Continent. Professor Thompson has written several works on elec-

tricity, and has contributed a number of papers on physical and geometrical optics to the "Proceedings" of the Physical Society. His lectures on "Light, Visible and Invisible," which were given before the Royal Institution, were published in 1897. Professor Thompson has also compiled a series of "Optical Tables," which is used by students in the S.M.C. examinations, and he has recently translated into English, Lummer's "Photographic Optics," to which he has also added appendices. Professor Thompson is probably better known in connection with his investigations in the application of science. His works upon electrical storage, dynamo electrical machines, and the arc light, are now well known to every electrician. In this connection he has been awarded three silver medals by the Society of Arts in recognition of his services. He is a Fellow of the Royal Society, Fellow of the Royal Astronomical Society, President of the Physical Society of London, Past President of the Rontgen Society, and also of the Institution of Electrical Engineers. He is a member of the Royal Academy of Science at Stockholm, and is one of the examiners in the University of London. In 1891 Professor Thompson was elected as one of the Vice-Presidents of the Electrical Exhibition at Frankfort. Two years later he acted as one of the delegates to the Electrical Congress at Chicago, and, in 1899, he served in the same capacity to the Italian Congress, at Como.

Commercial & Legal Intelligence.

THE Service Photographic Society, of 292, High Holborn, London, W.C., have an arrangement by which customers are entitled to a share in the profits. The accounts for the year are now being made up, and those who are entitled to participate should send in their claims at once.

BULLER'S Last Appearance at Aldershot.—This is a new cinematograph film issued by Messrs. L. Gaumont and Co., 25, Cecil-court, London, W.C. General Sir Redvers Buller, V.C., is shown supervising the infantry training at Bisley, and as the picture opens, a number of foot soldiers in extended order are seen advancing across a plain, General Buller following close behind on foot. Then comes a close and full portrait of Buller as he walks across in front of the camera within a few feet. Finally, Buller is seen standing among a group of other officers.

BIOGRAPHS Not Wanted.—In order to make life pleasanter at the St. Ermin's Hotel, Westminster, the proprietors ordered biographs and mutoscopes from the British Biograph and Mutoscope Company, Ltd. Unfortunately, when the machines arrived, they were so noisy, that the guests in the hotel insisted on having them stopped. The machines were returned to the company, and, before Mr. Justice Grantham, the Biograph Company sued the hotel directors for £110, the value of the machines. Mr. Justice Grantham gave judgment for the plaintiffs with costs.—"Evening News."

JAMES Oliver and Co., Limited.—Registered by Stock and Slarer, 19, Walbrook, E.C., with a capital of £2000 in £1 shares. Object, to take over the business of a portrait copyer and enlarger, miniature painter, medallion and advertising button manufacturer, frame-maker and importer, photographer, photographic lithographer, and dealer in photographic appliances, carried on by J. H. Atkins, trading as James Oliver and Co., at 154 to 157 Fleet-street, E.C. No initial public issue. The first directors (to number not less than two nor more than five) are, J. H. Atkins (permanent managing director). O. L. Atkins (Secretary), and A. Allison. Remuneration as fixed by the company.

THE Lumière process of three-colour photography, by the indirect method.—The Lumière North American Company write:—The unusual interest shown in the specimens of this process exhibited in this country at the Oxford meeting of the Photographic Convention, and also in the 1901 Exhibition of the Royal Photographic Society, has created a demand for the materials necessary for the production of these results. To meet this demand, we are placing upon the market a case containing all necessary materials for this process, up to the size of $5\frac{1}{2} \times 4$ inches. The case contains taking screens, specimen monochromes, finished specimen, and all dyes, gelatines, transfer papers, paper and glass supports, together with full instructions for working, enabling any one possessed of an ordinary camera to produce results by this process. The price, complete, is £2 12s. 6d., and we shall be glad to give any particulars to those interested in the process.

MR. Charles Neufeld, who was a prisoner for twelve years among the Dervishes before Lord Kitchener went to Khartum, wrote an illustrated book describing his sufferings, entitled "A Prisoner of the Khalifa." The book was published by Messrs. Chapman and Hall, London, and was the subject of an action before Mr. Justice Walton recently. Mr. Neufeld, in addition to claims for royalty on an issue of the book in Germany, and its publication in an English magazine in serial form, sued for £207 as the cost of the photographs for illustrating the work. As a set-off against this claim the publishers lodged £23 in court. The Dervishes who had been photographed had, it was stated, the greatest objection to face the camera, and had to be paid heavy backsheesh before going through the ordeal. On the photographic point the decision was given in favour of Messrs. Chapman and Hall, with costs. Mr. Neufeld got a verdict on the royalty claims with costs, a stay of execution being granted.—"Daily Mail."

ALLEGED Extensive Frauds.—George Hypolite Le Bluff, 32, greenhouse-maker, of Ladywell-road, Ladywell, was charged last week at Greenwich Police Court, on remand, with obtaining £1 2s. 9d. from Stanley Page Hutton, of Judges Cottage, Sundridge, Sevenoaks, Kent, by means of a trick. Mr. Rose appeared for the Public Prosecutor, and Mr. Llewellyn Davies defended. A number of accused's workmen appeared, and stated claims for wages amounting to £17. It was agreed, with prisoner's consent, to divide £5 in cash out of £25 found in prisoner's possession (the rest being in postal orders and cheques) among them. Mr. Rose said that prisoner took a vacant piece of land at Straightsmouth, Greenwich, put up a shed, and started business under the name of the Straightsmouth Portable Building Company. He had a staff of about a dozen men and boys, and proceeded to advertise extensively in the name of the firm, and also in the name of Mitchell, green-houses and fowl-houses for sale. He received a large number of orders for buildings, which almost invariably were not delivered. The police received numerous complaints, and visited prisoner's place to make inquiries. Information was subsequently laid by Mr. Hutton, and a warrant was issued. On prisoner's office at Ladywell (which consisted of a back room) being searched, three copy-books, a number of memorandum-books, and letters were found, showing that 232 persons had sent a total amount of upwards of £500. With very few exceptions nothing had been sent in return. Evidence in support of the charge having been given, Mr. Davies said he could show that accused was doing an extensive business, and though there had been a certain amount of laxity and delay, 75 per cent. of the orders were executed. Remanded.—"The People."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
11.....	Camera Club	Exhibition of Members' Lantern Slides.
11.....	Croydon Microscopical	Mr. Rudler's Sixth University Extension Lecture.
11.....	Southampton	*A Holiday in Northern Italy.* J. D. Haysom.
12.....	Birmingham Photo. Society ...	Demonstration: *Uses of the Enlarging Lantern.* Bernard Moore.
12.....	Leeds Photo. Society	*The Photography of Colour.* C. B. Howdill, A.R.I.B.A.
12.....	Stonehouse	Elementary Photography: *Apparatus, &c.* G. T. Bayley.
13.....	Camera Club.....	Amateur Photographic Field Club, Ladies' Night
13.....	Croydon Camera Club	Sixty-first Lantern Show.—*Grenada and the Alhambra.* R. Child Bayley.
13.....	Photographic Club	*Stereoscopic Photography.* T. W. Derrington.
13.....	Southport	*A Dark-room Chat on Art and Photography.* C. H. Brown.
14.....	Camera Club	*Bacteria.* B. N. Tebbs, M.A.
14.....	Darwen	*Systematic Toning.* By "Grapho."
14.....	Liverpool Amateur	*Composition and Tone Values.* W. E. Tindall, R.B.A.
14.....	London and Provincial	Paper by John A. Randall.
14.....	North-west London	*Elementary Bromide Printing, Enlarging, &c.* H. Date.
15.....	Bognor	Demonstration: *Venus Paper.* E. Humphrey.
15.....	Borough Polytechnic.....	Instruction Evening: *Defects in Negatives: Prevention and Remedy.*
15.....	Croydon Microscopical	Prize Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 31,—Mr. A. Mackie in the chair.

With regard to some remarks on uranium toning, made at the last meeting, Mr. Brown said he had found a note made by him of a formula published in 1882, and which had given satisfactory results, namely, uranium nitrate, 10 grains; ferricyanide of potassium, 10 grains; water, 10 ounces. Also a formula given by Dr. Eder, and which was a much stronger solution, published in 1865, for toning collodio lantern plates, uranium nitrate, 1 gramme, ferricyanide, 1 gramme; water, 100 c. c., in regard to which Dr. Eder went on to say, that should the solution when made up show any signs of cloudiness, it should not be used, as it showed that the ferricyanide used was not a pure sample. Mr. Brown also quoted another writer, who advocated that the plate should be first flooded with a solution of uranium nitrate, which was then to be poured off, and a few drops of ferricyanide added, and the solution again returned to the plate.

Mr. Drage remarked on the absence of acid in these formulæ of years back, as all the recent formulæ include an acid, which, besides any other function, helps to keep the whites clear.

Mr. L. Kamm gave a demonstration of the "Kammatograph," being a filmless cinematograph invented by him, having previously very clearly illustrated the mechanism by a series of lantern slides describing the various sections connected with the design, the great advantage claimed being in the use of glass discs, instead of the dangerous celluloid film. In the particular machine shown, the plate receives the pictures in a spiral form to the number of 550, lasting about three-quarters of a minute, the lens used being a Voigtlander of 1-inch focus, working at 5.6.

Mr. Brown thought that a disadvantage was in the fact that only one plate could be used, it being necessary to retire to a dark room to reload.

Mr. J. E. Hodd queried whether it was not possible to have the plates recoated, as circular plates of this description must necessarily be very expensive, to which Mr. Kamm replied that sixpence each was

allowed for spoiled plates returned in good condition; also two new plates would be given in exchange for a good negative. The plates are coated by Messrs. Austin Edwards, and have a speed of 200 H. and D.

In reply to a question put by Mr. Everitt as to the speed of the shutter, it was stated that different shutters can be used for giving various speeds, but the usual speed for an average light is 1-40 sec., the pictures being taken at a rate of 12 to 14 a second.

Mr. Freshwater announced that on Thursday, November 7, Mr. Randall would give a paper on the "Problem of Actinometry."

The meeting ended with a very hearty vote of thanks to Mr. Kamm, proposed by Mr. Drage, and seconded by Mr. Everitt.

Croydon Camera Club.—Home-made Apparatus.—A diversified fare was set before members on Wednesday, 30th ult., when a large number of ingenious devices—many of them new—and mostly hand-made by members, were shown and explained. Mr. J. Noaks created considerable interest by the exhibition of his hand camera devised to carry lenses of three different foci, and having all movements and adjustments necessary for any kind of field work. Other cameras, which had been partly home-made, were stereoscopic ones made by Mr. Costa and by Mr. Edgar; that of the latter was also designed by the maker, and embodies several specialities of considerable utility. Mr. C. E. Kenneth Mees showed a lantern in which he had applied a combination of Sugg's Christiana burner with a Welsbach mantle, and obtained therewith an illumination of nearly 200 candle power—a satisfactory picture was shown on a six-feet disc. Mr. Harpur showed and explained an admirable exposure board for centering and adjusting lantern plates, ordinary negatives and bromide paper, while enlarging or reducing; also home-made contrivances for cutting waste quarter plates into cover glass, and squeegee for removing bubbles which appear while plates are in developer. Mr. W. H. Smith aroused remarkable interest by two unfinished models of new forms of direct vision cinematograph machines, No. 1, worked by means of a rotating barrel, having intermittent motion. In No. 2 a cylinder or drum was employed. The movements in both seemed quite efficient. Mr. Smith, amidst loud applause, promised to bring up a finished machine as soon as completed. He also showed two ingenious forms of plate rests. Mr. Kough explained an electric dark room lamp possessing good features, also his device for washing prints and negatives, etc., without needing a dish. It is very effective, washing taking less than half the usual time, and is especially valuable for those who can only get temporary use of sink or bath, etc. Mr. S. H. Wratten aroused much attention by showing how he made passe partouts, which were quasi frames. A very busy evening which drew a large attendance was concluded with a vote of thanks to the above gentlemen.

The Liverpool Amateur Photographic Association.—At the sixth ordinary meeting Dr. Ellis gave his lecture, "The Queen of English Rivers." He traced in a most interesting paper the river Wye, from its source in the boggy uplands of Plinlimmon to Chepstow, where it empties itself into the Bristol Channel, the description of the various places on route, Rhayader, Builth, Hay, Hereford, Ross, Monmouth, and Tintern Abbey, being followed with rapt attention. The lecture was illustrated by numerous very fine slides made by Dr. Ellis, and included a number of architectural studies, for which the lecturer is famous, these being received with marked approval by the audience.

Southport Photographic Society.—On Wednesday, October 30, at the Temperance Institute, Mr. John Norton, in the unavoidable absence of the President, Mr. D. E. Benson, presided over a good attendance, to hear Mr. Phethean, the representative of Kodak, Limited, for the North of England, lecture on "The Use of the Kodak." A large assortment of the various kinds was lent for the occasion by Mr. J. R. Cave, of 52, Nevill-street, Southport. Mr. Phethean aptly described their various advantages, paying special attention to the latest invention, the stereoscopic camera. The Chairman, who had on many occasions, travelled abroad, endorsed the lecturer's remark as to the ingenuity of construction and simplicity in use of these cameras, and stated that with a two-guinea folding Kodak he had been able to secure many scenes which otherwise would have been impossible. After the lecture refreshments were provided, and a very successful photograph taken of those present by means of a flashlight cartridge.

FORTHCOMING EXHIBITIONS.

1901. November 8	Hackney Photographic Society, Morley Hall, Hackney. Hon. Secretary, Walter Selfe, 70, Paragon-road, Hackney, N.E.
„ 23–30	Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.
Dec. 3–7	Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.
„ 20–Mar. 1902 ...	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.
1902. „ 24–Jan. 4, 1902	Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.
February 19–26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydor.

Patent News.

THE following applications for Patents were made between October 21 and October 26, 1901:—

SUB-AQUEOUS PHOTOGRAPHY.—No. 21,046. "Improved Means of indicating the Depth of Water in Rivers, Harbours, Seas, and the like, and Photographing said Depths to Scale or otherwise." JAMES DILLON.

AUTOMATIC PRINTING.—No. 21,066. "Improvements in Apparatus for taking Photographic Impressions at Predetermined Intervals of Time." WILLIAM HAROLD TINGEY and ARTHUR ANNESLEY VOYSEY.

COATING MACHINES.—No. 21,154. "Improvements in Machinery for coating Photographic Papers and Films with Emulsion." JAMES WILLIAM THOMAS CADETT.

REELING MACHINERY.—No. 21,155. "Improvements in Machinery for reeling Photographic Papers and Films." JAMES WILLIAM THOMAS CADETT.

LENSES.—No. 21,211. "Improvements in Objective Lenses." RUDOLF STEINHEIL.

LANTERNS.—No. 21,238. "Improvements in Optical Lanterns." ABRAM KERSHAW.

PHOTO-SCULPTURE.—No. 21,245. "An Improved Process of Photo-sculpture." Complete specification. WILLY ALFRED CARL SELKE.

RAPID PRINTING.—No. 21,248. "Improvements in Gearing and Negative-Holders connected with Photographic Printing Apparatus, and in System of Changing Negatives." (Communicated by A. V. Christiani-Mayall.) Complete specification. THE RAPID PHOTO-PRINTING COMPANY, LIMITED.

SHUTTERS.—No. 21,438. "Improvements in Shutters for Photographic Cameras." LESTER JAMES CROSS.

CHANGING BAGS.—No. 21,537. "Improvements in Changing Bags for the Plates or Films of Photographic Cameras." MAGNUS NIÉLL.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPH OF THE SEA SERPENT.

To the EDITORS.

GENTLEMEN,—I note in last week's BRITISH JOURNAL OF PHOTOGRAPHY you would like to see a photograph of the sea serpent. Are you aware that a natural colour photograph of this, shall I call it reptile has been shown at the R.P.S. Exhibition at the New Gallery? It was depicted on a slide of "Jonah and the Whale," prepared by the writer, being taken from one of the windows in University College Chapel, Oxford.

The "whale" was more of a sea serpent, according to reports, than its name would imply, the body being long and sinuous, finished with a fish tail, and the head most hideous, with bulging eyes, and the mouth furnished with huge saw-like teeth, the colour of the whole being foxy-red. The interesting part is the fact that it was the conception of a Dutch artist, Abraham van Linge, in the year 1641.—I am, yours, &c.,

CHARLES B. HOWDILL.

7, Oxford-row, Leeds, Nov. 2, 1901.

THE PRESENT POSITION OF PROFESSIONAL PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—As one of the Committee of the Professional Photographers' Association present on the platform at the Polytechnic on the opening night of the photographic school, I must say that I was very disappointed in the main with Mr. Howard Farmer's address on the above subject, and contend that he quite failed to contribute any ideas that are practicable and feasible and likely to be applied to the case with real benefit, for Mr. Farmer, if I may use a theatrical phrase, "played to the gallery." His chief bone of contention seemed to be that photographers were a long time delivering clients' orders, and that, if this were altered, a great demand for photography would set in, and if proofs were shown at the sitting from wet negatives and bromide prints delivered inside twenty-four hours, that our photographic salvation is assured. Now, I should like, with your kind permission, Messrs. Editors, to deal with this from the only practical standpoint, viz., that of the professional photographer in active business to-day. I have been in business myself for some twenty-four years, and I think I may say that for twenty-two years out of that time I have done all my own operating, thus dealing directly with all sitters. For many years now I have done a considerable business in collodion enamels, silver prints enamelled with collodion, and of a purple-black

tone. This has been coupled with special lighting, and has secured a considerable following, sitters coming long distances sometimes for these effects. Now, this kind of picture is so diametrically opposed to the blue-black tone and matt surface of a bromide print, that sitters will not accept the one for the other. I have tried to persuade them to have bromides in rainy weather, but they would not; and, also, I have taken it upon myself to finish off the orders quickly in bromide, and sent the pictures home with a polite note to the effect that, as the prints were wanted in a hurry to catch a mail by a certain date or to help to celebrate a birthday, I had done them by artificial light in this process, and I have had them returned with the intimation that they preferred to have what they had paid for, and would wait until the work was done properly, that is, according to their requirements; and quite right, too, say I. As the sitter pays, he ought to get what he desires, on the principle that those who "pay the piper have the right to call the tune." In general practice, I take three poses of each sitter, and often four and five, and if I take four poses, say, and develop the negatives and show the sitters wet bromide paper prints (while they wait), what is becoming of the sitters that are waiting downstairs in the reception room for "their turn next," as the hair-dressers say? Why, their patience is exhausted, and they depart with the intimation to the receptionist that they cannot wait any longer, and will call to-morrow, which they invariably fail to do.

"Strike the iron while it's hot" is a good English axiom, and take your sitters' photographs, and take their money as well, while you have the chance, is a very good photographic axiom. This would often be interfered with by adopting Mr. Farmer's way, and, in my opinion, the showing of proofs at the sitting in any live business would be nothing short of a veritable nuisance. I show untouched and partly retouched proofs the day after sitting—sit to-day proofs to-morrow—and promise the finished work in from two to three weeks, and usually these promises get kept, and the sitters are perfectly satisfied, and send me unsolicited testimonials, and give repeat orders also, which are placed in hand at once, and, of course, take less time to produce than the original order, as the negatives are already retouched and varnished, and can go to the printing room at once and be filled in.

Mr. Farmer's reference to the biograph at the Palace Theatre and the rapidity with which these cinematograph pictures are produced is wide of the mark, and, in my opinion, has no bearing whatever on every-day studio portraiture. The invitation to adopt something of the same tactics as the "smoke and bubble people," and call on the local furniture emporium and make arrangements with them to take pictures of babies whose parents buy their bassinets, is the very kind of thing that all professionals worth anything at all as careful and artistic workers abhor. The suggestion that the photographer should send out 10,000 pamphlets, illustrated by half-tone blocks and descriptive letter-press, sounds very pretty, but it would cost a lot of money to do it, and the financial result of the venture would be very questionable (just now, at any rate, while this war is on).

Mr. Howard Farmer's idea that photographers cannot manage babies and young children, and that children are not at home with a male photographer, I have not experienced myself, and I have taken thousands of children, and have many times had children cry to leave the studio and to go away from the toys and musical boxes and kind attention they have been receiving. The idea of having a lady operator in for children's portraits at certain specified hours or times is impracticable, for several reasons: one is, that probably the day that the lady operator arrives to take your booked appointments for children it is as black as night and raining hard, and all the appointments are accordingly "off." Another reason is that the studio is (or should be) looked upon as the workshop of the photographer, and that only the man who is thoroughly and constantly conversant with the lights and plates and lenses and developers (and the many other items that go to make up a first-class negative) is able to do this satisfactorily, and the lady occasional operator would, in my opinion, be an absolute failure. We don't need lady operators specially, nor proofs to be shown at the time of sitting from wet or untouched negatives, nor pictures delivered inside twenty-four hours, and done anyhow against time, nor cartes charged at 2s. 6d. per dozen.

I think that the uplifting of photography, from a professional's point of view, does not lie in these things that Mr. Farmer suggests, and which incidentally goes to prove that to be a class-room professor is one thing, and to conduct a successful portrait business is another, and that the same rules do not apply to both cases. What we need is a first-class photographic training in business houses (especially after class-room tuition), a desperate love of the work, a clear brain, and artistic conceptions, coupled with natural and physical energy, and a great desire to excel in rendering, not only good likenesses, but "pictures," too, in fact, get "pictorial photographs," as against diagrams of faces. Also we want the binding and banding together of all good photographers, pledged to fetch the best out of themselves by diligent and intelligent study of their art and all its possibilities, and the teaching of the public that all good things cost money, and that good things are not necessarily cheap, as cheapness is apt to be understood nowadays, and that doing a thing well takes time and that a photograph well done and perfectly satisfactory to both photographer and sitter is likely to be a thing of beauty (and, if printed in a permanent process,) also a joy for ever. We want to produce pictures that we should like to "live with," and photographic work to be done in the future that shall tend to "level up" photography in the eyes of the general public, and also that photography shall be a remunerative profession for educated and clever men to follow.

Mr. Howard Farmer must please excuse my criticism of his address, but as it was delivered in full meeting to all those interested in and engaged in photography, and eventually published in your valuable JOURNAL, I presume it is open to discussion.—I am, yours, &c.,

Sydenham, S.E. H. HALLIER.

A NEW METHOD OF REDUCTION.

To the EDITORS.

GENTLEMEN,—Whilst thanking you for your kind notice of our West Surrey meeting, will you allow me to state that the terebene used (which is not absolutely necessary) is the common commercial article sold at the oil and colour shops as a paint drier at about 8d. per pint; not the refined spirit at 1s. per ounce.—I am, yours, &c.,

ROBERT H. BASKETT.

27, Eccles-road, Clapham Junction, S.W.

MEASURING THE INTENSITY OF LIGHT.

To the EDITORS.

GENTLEMEN,—I was rather bewildered by Mr. Steadman's article in the JOURNAL of September 27, and, when in a recent issue, I saw the matter taken in hand by Mr. W. Webster, I had some hopes that my mind would be cleared, and I should know what law it is that is "accepted in practice, that will make six times the expanse of the natural sky pass through an opening 40 cm. in diameter, and strike a point at 4 cm. from its plane." How interesting a diagram illustrating this law would be. Will Mr. Steadman, or Mr. Webster, who appears to understand him, state by what name this law is known? I am still as mystified as ever.

But in regard to the law of inverse squares, which our author on September 27 seems to think he has stated, and which, unfortunately, Mr. Webster appears to give him credit for having stated, would it not be as well, in case some very young student should be led astray, to publish the fact that "the quantity of light falling on a given surface varies inversely at the square of the distance from the source" is only an approximation useful where the distance is great compared with the size of the source, and, although 1 cm. is, no doubt, large in comparison to a "point," even our very young student will see the fallacy of treating a surface of 2 square metres as the given 1 square metre. Referring to Mr. Steadman's question, too, concerning this. "Could the extra metre, added around the edges of the other, be said to receive as much light as the original surface of 1 metre in the centre of the plane?" In answer, certainly not, for, in accordance with the law of inverse squares, equipotential surfaces tend to become concentric spheres as we move outward from the source; and the mind that could imagine a plane 2 square metres as approximating to spherical surface of 1 cm. radius, would be fit, I should say, to imagine "six times the expanse of the natural sky," etc. The fact that our author could lift his pen from his paper, that the force between two surfaces in contact is not infinite, should have led him, if he were a man of modest mind, to begin to suspect that he himself were wrong, and he would have sought a proper interpretation of a law that is good enough for our Maxwells and Kelvins.

In regard to the illumination of a surface by a surface, in accordance with our law, the total illumination of the 1 cm. square would be the sum of the quantities of light received by all its elementary parts, and each such part would be illuminated by every elementary part of the 1 square metre, and it is to these small elementary parts that the law of inverse squares applies. If the parts are taken small enough, and the result summed up in the way that has proved so convenient in practice, there will certainly be no measurable error as we approach infinity; but the calculated illumination will correspond with the observed, and will, in total, vary as the squares of the distances only when the distances are great.

The problem of the illumination of a point on a sitter at a certain distance from a window, assuming the window to be the source of light, is in no essential different to many questions that every mathematical student of physical science has to tackle; for instance, the potential at a point, due to a gravitating disc, and is solved by the application of the law of inverse squares as above. I should be interested in knowing how Mr. Webster makes the illumination vary inversely as the distance when the angle of light is small, and also how this applies to Mr. Steadman's cylinder? I should like to understand that. In conclusion, the law of inverse squares is absolute when properly applied to the interaction of small elementary parts.—I am, yours, &c., C. J. STOKES.

199, St. John's-hill, S.W.

PHOTOGRAPHY FOR THE PRESS.

To the EDITORS.

GENTLEMEN,—In a recent issue of the "Black and White Budget," they used a photo of mine, and (as per their advertisement in the JOURNAL) I wrote for the usual fee, but their reply was a blank refusal, adding that under the existing copyright laws I had no legal standing. Therefore I should like my brother professionals to know how "'Black and White" treated me, that they might not expect to get a small fee, as I did, for the use of their productions which they advertise to give you.—I am, yours, &c., F. WAKEFIELD.

THE LUMIERE COMPANY.

To the EDITORS.

GENTLEMEN,—In your last issue you gave notice to a report that the colossal dry plate, film, and sensitive paper-making establishments of Messrs. A. and L. Lumière at Lyons, France, had been "bought up" by Mr. George Eastman.

May I ask you, on behalf of the Lumière N.A. Co., Ltd. (who are the sole proprietors of the famous products of Messrs. A. and L. Lumière, of Lyons, throughout Great Britain, India, the Colonies, and North America), to emphatically contradict this report, for which there is not the slightest foundation, and which in all probability owes its conception to the "wish being father to the thought."—I am, yours, &c.,

Lumière N.A. Co., Ltd.,
THOS. K. GRANT, London Manager.
78, Queen Victoria-street, London, E.C., Nov. 2, 1901.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—I have read with interest Mr. Howard Farmer's address at the Polytechnic, particularly that part of it referring to the admission of employees to membership of the Professional Photographers' Association, also the letters on the subject that have appeared in your columns since it was delivered. Now, I do not think it at all likely that the P.P.A. will alter its rules so as to admit assistants, and, if it did, I do not, as an employee, think that we should join it. The interests of employers and employees are not always in unison. In most trades there are masters' and workers' associations, and they are an advantage to both parties. Why should not the employees form a Society amongst themselves as the employers have done? The two Associations could work together to the mutual advantage of both. It has been said that there is no unanimity amongst photographers, but that is disproved by the fact that something like 500 have already joined the P.P. Association. Why should not the same unanimity exist amongst the employees, and they form a Society among themselves?—I am, yours, &c., GEO. CONWAY.
London, S.E., Nov. 1, 1901.

THE SULPHOCYANIDE BATH.

To the EDITORS.

GENTLEMEN,—Replying to "L. B.," I found the sulphocyanide bath to injuriously affect my fingers, making them very tender, and softening the finger nails, but have stopped it by using the sensitive finger-covers, supplied by Messrs. Houghton and Son, on every finger that comes in contact with the bath. They are very thin, and do not hinder work; they can only be removed by rolling back, and at first I found them to stick in unrolling, so that they would not have lasted long, but I have got over that difficulty by rubbing on a little powdered French chalk after drying them, and now have no trouble in this respect.—I am, yours, &c., T. STOKOE.
Clare, Suffolk, October 29, 1901.

A BUBBLE THAT BURST.

To the EDITORS.

GENTLEMEN,—Home on my wheel, with spirits high, the haunting goblins of rent due and taxes unpaid, and the nightmare of a meter captured by the soulless gasman, vanish with each revolution of the wheels of my tin gee-gee. The wildest dreams of the greatest dreamer that ever shouldered his pick and treked for the gold plains of Klondike were a mere bagatelle to my castles in the air as I left behind me the lights and bustle of the city and pedalled my joyous way home. "Every photographer a publisher" kept ringing in my ear. Here was my chance. Here were the sinews of war to keep a surly landlord at bay, to defy the threats of the hirelings of the gas company, and treat with contempt the final notice of the tax-collector.

Home at last, with a rat-a-ta-tat on the knocker that brought the wife to the door with a hop, skip, and a jump. "What now, you booby; don't you know the baby is asleep?" Hang the baby. No more hard times in this show; I got an idea at the Polytechnic to-night, and it means lucre, and plenty of it. What's this, four ale for supper? Not for me; Bass is my tipple from this out, which you will produce forthwith. You want cash? Oh, tell him it's all right; we'll clean the slate in a few days. And, look here, you tell him that your man is going to be a publisher, going in for literature; just let him know I'm no mug. What, no Bass! What slate! Says he has no more chalk! Does he? don't let me see you go near that house again.

"What's up?" you say. Well, that ere meeting I was at to-night put me on to a gold mine. I am going to write up the business houses in this district, make half-tone blocks of the shops and managers, put the lot into the hands of the printers, and there you are. Where is the gold mine? Why, I will get a quid a time from them. I can get thirty, and no trouble. Thirty quid! Just come in handy for Christmas. "Where does the printer come in," you say? Oh, he's all right; it won't take a pile to do a bit of printing. I will see him in the morning. And now to bed.

What silly questions you are asking. "What about the blocks?" Why, no trouble; just the same as copying, only print on copper instead of P.O.P., etch it, and make it type high. There you are. What is "type-high?" Oh, go to sleep, don't bother me. Give me an early call in the morning. I want to see the printer first thing.

Here, here, what's the matter? Time I was up. Oh, yes, the publishing racket. A wash up, a hasty breakfast, and off to the printer. "Ah, good morning, Mr. Type. I want you to quote me for a pamphlet, say about 6000, 30 pages; I am going to illustrate and write up the business houses in the district. Don't mind the blocks; I'll do them myself; there will be about thirty of them." "What size will your pamphlet be? Anything like this?" and he turned round to get a specimen, with a broad grin on his face, tickled, I suppose, at making such a good start in the day's work. "Yes, that will do; how much per 1000?" "Ah, well, you had better let me prepare you a dummy, and send in our estimate in a few days." "Can't you quote right away?" "I would prefer not." "All right, you let me know as soon as possible. Good morning." He's too slow for me by half. Why did he not say a couple of quid, and have done with it? A dummy! What do I want with a dummy? It's a pamphlet I want.

Well, I will have a try at Mr. Ink. He's more pushing; he'll run them off in no time. "Ah, good morning, Mr. Ink. I want you to quote for about 6000 pamphlets, 30 pages; there will be, say, 30 blocks. I am going to write up the business concerns in the district. I will supply the blocks; just say how much per 1000 for printing." "Right; I can quote you without moving, as I have just sent in an estimate for the same thing in another district. They will cost you £17 10s. for the first thousand, and £8 10s. per thousand after." "What! you're joking." "Who's joking? Me or you?" "Oh, no offence; of course, I am new to the business, but I thought as I would supply the blocks you could do the printing for a song." "What song? Look here, Mr. Dryplate, if you have nothing else to do but spend time asking foolish questions, I would like you to understand that my time is more valuable. Good morning." "Here,, won't you let me explain?" "I said good morning."

My high spirits drop to zero. Once more my old friends the goblins hold sway. But no, I won't be downed so easy. I will get quotations for blocks—haven't time to make them. Back home to write for quotations. No, writing is too slow. I take my tin gee-gee and hie me to the city. But let me drop into oblivion once more. Let those who want to become publishers do so; as for me, I will plod on in my old way, as I have no money to lose on a hobby. I had counted on thirty subscribers at 20s. each. I intended to distribute, free, 6000 pamphlets, the delivery of same, 30s.; printing, £60; blocks, £10; total, £71 10s., for which I would have £30.

As I mean to try and pay 20s. in the pound, I have dropped the idea of trying the lecturer's gold mine, as I am afraid it was "salted."—I am, yours, &c., DRYPLATE.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITORS.

GENTLEMEN,—Referring to "J. A. R's." letter in your impression of the 25th ult., it may interest some of your readers to know that two or three years ago a canvass of the members was made on the question of awards at the annual exhibitions, with the result that the practice of distributing medals continues.

One would have thought that the exhibitors at the New Gallery, especially those who class pictorial photography among the fine arts, would not require the chance of obtaining a medal to stimulate them to show their best work. But the majority of members appeared to have thought that the exhibitions would suffer by the absence of awards; for one cannot believe that any object other than the success of these annual shows influenced the voters, and thus the old practice continues.

What may seem somewhat anomalous in connection with these awards is the method of selection adopted by the Society, whereby a small committee decides which of its members shall, and which shall not, compete for medals provided by the funds of the Society, to which all contribute.—I am, yours, &c.,

ONE WHO FAILS TO APPRECIATE THE ADVANTAGES OF BEING F.R.P.S.

THE PHOTOGRAPHY OF MOVING WHEELS.

To the EDITORS.

GENTLEMEN.—I am obliged to your two correspondents who have been good enough to answer my query regarding the above. Unfortunately, however, the opinions which they express are diametrically opposed to each other.

Mr. Nash holds that a photograph taken in the way indicated would be practically that of a revolving fly wheel, whilst "Y" states that there would be, relatively, no difference in the definition of the spokes, although the whole would be sharper.

I regret I have not sufficient technical or scientific knowledge to discuss the question with any degree of authority, but I am inclined to favour "Y's" contention as being correct. Mr. Nash has not shown any reasons why the carrying along of the camera by another car at the same rate of speed should annihilate the difference, both as regards speed and direction, between the upper and lower parts of the wheel.

Manifestly, the difference in speed between the point in contact with the ground and the point in the circumference immediately opposite would, if the wheel were large enough, greatly exceed the rate of motion of the vehicle as a whole; and the direction of the motion is an important factor, for, I conceive, that every kind of independent movement of any object in or upon the car would, if the exposure were not sufficiently short, produce its effect upon the photographic plate.—I am, yours, &c., J. M.

THE SPY MANIA ABROAD.

To the EDITORS.

GENTLEMEN,—In reply to Mr. J. Dormer, in "Photographic Spies," I did not ask if Gibraltar was illustrated well or bad in a magazine. I asked if I, personally, could take views there. I did ask this because I think I read in THE BRITISH JOURNAL OF PHOTOGRAPHY itself that not even any instrument was allowed there, much less photo taking itself. By mentioning Woolwich in that circumstance, I certainly did not mean the photographing of the narrower streets, nor the cabbage fields (if there are any there) around the City, but the arsenal, or the boats, or ships. To this Mr. J. Dormer answers, after all, No, it is not allowed in any country.

To conclude with, I would say, in a general way, to English amateur photographers, When you cross the Channel with your camera, do not expect any more freedom in button pressing on the Continent than you give, or have given, in your own country; but certainly, not much less, and in some cases more, than in England. And by the Continent I mean not only France, but Germany, Italy, and others, to which you have yourself added lately in your "Answers to Correspondents," little Belgium. This seems to be also the advice of Mr. J. Dormer, so that, after all, we may agree.—I am, yours, &c.,

Asnières (Seine), November 3, 1901. A. LEVY.

THE DISCOUNT QUESTION.

To the EDITORS.

GENTLEMEN,—I have read with much interest the various letters re discounts to professionals, and shall be glad to receive the names and addresses of professional photographers who agree with the remarks of "Emancipation," as I have a scheme to place before them which should prove satisfactory.—I am, yours, &c., S. SCOTT.

48, Petherton-road, Highbury, N.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

H. Osbourne, 25, Arcade, Walsall. *Two photographs of the late Rev. J. Till.*

W. G. Thomas, 11, Paignton-street, Derby-road, Nottingham. *Photograph of picture of Liverpool.*

PHOTOGRAPHING SILVER.—"MESTHA" writes: "In photographing silver things I find it very difficult to get the image dense enough. The enclosed platinum prints will show my meaning. The amount of printing required to ensure the background being black, makes the image of the object too dark. These photos were taken in the open (not in direct sunlight) on a slow plate, lens RR. 9½-inch focus, diaphragm f-22. The image is almost full size of the original. Can you suggest a way out of my difficulty?" In reply: The best way out of the difficulty is to get a darker background if you wish it to appear black in the photograph. The negative seems to have been under-exposed, and made too dense by a forced development.

ADDRESS WANTED.—E. R. Y. writes: "Will you please favour me with the address of the Secretary of the Professional Photographers' Association."—In reply: The address is, The Honorary Secretary, Professional Photographers' Association, 51, Baker-street, London, W.

VARIOUS QUERIES.—"NUISANCE" writes: "(1) Is it possible to get back numbers of the "Lantern Record Supplement" to THE BRITISH JOURNAL OF PHOTOGRAPHY, without the numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY? (2) Can you advise me as to a really practical exposure note-book? (3) On reading over an American photographic catalogue, I have come to the conclusion that I don't know the value in English money of a dollar. Will you enlighten me; also the number of cents in a dollar?"—In reply: (1) Not without THE JOURNAL. (2) If you refer to the ALMANAC for the current year you will find an article by the Editor, extending over thirty pages, dealing with the subject. (3) The American dollar is equal to about (according to the Exchange) four shillings and a penny English money. There are a hundred cents in a dollar.

VARIOUS QUERIES.—"POSTCARD" writes: "Please inform me the most suitable cameras, lenses, etc., for photographing landscapes, seascapes, interiors, exteriors, furniture, machinery, buildings, and materials, especially for making various process blocks for printing in illustrated books, periodicals, and other high-class printings. (2) The kind and most suitable photographic plate to use for the various classes of work, and process block. (3) Name a printers' trade journal (not photographic). (4) Has the plate to be same size as the illustration? (5) Name most suitable books on the above subject."—In reply: (1) The most convenient camera for that class of work is one of the portable form. The best lenses for the work are those of the anastigmatic type. Next that, one of the R R form. (2) Medium plates for the general work and "process" plates for the blocks. (3) "British and Colonial Printer and Stationer." (4) Preferably a size larger, to avoid any defects. (5) Half-tone process on zinc and copper, Verfasser, or "Half-tone Process on the American Basis," by Cronenberg.

INTERIOR PHOTOGRAPHY.—"INTERIOR" writes: "(1) Will you please advise me as to whether it is absolutely necessary to obtain permission of vicar of a church to photograph the interior of his church. I have taken one, on the assumption that he would not object; but he was asked if he would grant permission, and he refused. He first made excuse that he did not like making merchandise of the church; next, if it were taken, it should be by some one in parish, and that he would have it copyright. (2) Would I be acting illegally in selling any copies? (3) Another point I would ask you. Will you tell me what make of plates to use for interiors—slow or rapid. Would a thickly-coated plate, well backed, prevent all halation?"—In reply: (1) The vicar, we believe, is quite within his rights when refusing you permission to photograph the interior of his church. (2) As you have taken the photograph, we do not see how he can prevent you selling copies of it. (3) We prefer, for the work, a plate of medium rapidity. A thickly-coated plate, if well backed, will show a minimum of halation. We will not go so far as to say that it will prevent all halation under all conditions.

DISSATISFIED SITTERS.—"LITTLE WONDER" writes: "A few weeks since I took the photo of a baby, and did not ask payment from parents at time of sitting, as they wished to see proof before they could say how many they wanted. I sent proof a few days afterwards, and they wrote back, saying, 'We consider the baby's photo a good one, and desire you to send a dozen like the one enclosed.' I sent the dozen, and had them returned along with the proof, saying, 'We are not satisfied with the photos, as they are not as nice as the proof. The colouring is not near so good. If you can make them exactly like it, we will accept them, but not unless.' The proof I sent had a dark purple tone, and the dozen a brown tone. What do you think I should do? Can I take proceedings against them? as I understand a proof is of likeness, not of colour." In reply: Under circumstances, your customer was quite justified in refusing to accept the prints. They ordered a dozen like the proof, and you sent something else. He is evidently a very reasonable man, for he says, if you make the copies like the proof he will accept them. If you ordered a black coat from your tailor and he sent you a brown one, would you accept it, however good the fit might be?

PATENT MATTERS.—T. U. BARBER writes: "Seeing an article on or about Patents in this week's JOURNAL, and as I take the paper every week, I have taken the liberty of writing you concerning printing frame I have taken out protection for, nine months last June. Before doing so, I had the opinion of several professional friends, also gentlemen who take great interest in photo work. Also, I was advised to put the matter in patent agent's hands; so you see I have been to a good expense. Well, I have sent to several firms as to putting the frame on the market, and their opinion is, that it would cost too much to manufacture, unless there was machinery to make the fittings. I have shown my friends the letters returned with frame, and they think it would not cost so much if it were gone into properly. I thought before I give up the matter for good I should like to have your opinion before I took out patent for the frame, as I cannot afford to spend much on it. Now, sir, with your consent, I will forward frame on to you; also letters I have had concerning same."—In reply: We should advise our correspondent not to proceed further in the matter. He may take it that the manufacturers have declined his invention on very good grounds. We doubt if much room is left for novelty in printing frames.

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EX CATHEDRÂ.

The Kodak Meeting. The report of Monday's meeting of the shareholders of Kodak, Limited, which appears on another page, and for which we are indebted to our contemporary, "The Times," will, no doubt, be read with considerable interest. The purely financial affairs of the Kodak Company obviously concern those only who are directly affected—the English and American shareholders—but the business policy of the Board, which has before now aroused general discussion, cannot fail to be a matter to which British photographic manufacturers, dealers, consumers, and others, feel themselves obliged to direct attention. A fortnight ago we ridiculed the idea that Mr. George Eastman contemplated making an attempt to monopolise the whole of the photographic trade, and it will be seen by the "Times" report that that gentleman himself now dismisses the suggestion as an impossible one to carry into effect. But, as pointed out last week, a great combine is, admittedly, in course of negotiation, and it is natural that there should be considerable curiosity as to the particular English businesses which are to be absorbed. The following extract from the speech of Sir James Pender, the Chairman of the Kodak meeting, throws little light on the point: "The success which had been accomplished by amalgamation in 1899 of photographic printing-paper businesses, under the title of the General Artisto Company, they desired to accomplish in respect of some competing dry-plate and photographic businesses in Europe and America, which, from their standing in the trade, they considered to be of great commercial importance. Balance-sheets and profit and loss accounts had been produced showing large reserves of tangible assets, and the total earnings of the businesses for 1900 were about £250,000. Mr. Eastman had charge of the negotiations, and no one was better qualified for this important duty. The profits of the new company—if they combined all the businesses proposed—would justify the payment of a dividend of 10 per cent. on the ordinary shares of the new company, after payment of the preference dividend, and leave a margin over of some £150,000 for the year." Until more specific information on the subject is vouchsafed, all sorts of rumours and conjectures will be rife: meanwhile the trade is offered the assurances that the aim of the Kodak Company is "to produce and supply to the world the best possible goods at reasonable prices; and they could do this most satisfactorily by acquiring concerns already producing goods which specially met the needs of some of the classes they had, so far, only satisfied in part. They believed that the combination in contemplation was good for the consumer as well as the producer; for it would undoubtedly lead to better goods and lower prices. They were merely striving to give customers better and cheaper goods and give the dealer a better profit. They would continue their efforts in that direction, in spite of any outcry made by competitors."

Proxy Voting at the R.P.S. Meetings.

Apropos the special general meeting of the R.P.S., which is reported on another page, it seems to us a curious matter that the country members do not avail themselves of a privilege which is undoubtedly theirs. We refer to the right to vote by proxy. We are quite aware of the fact that the opinion that this privilege cannot be exercised exists, but that this is a fallacy can easily be shown. The President, in his annual address of which the above meeting was the outcome, particularly pointed out that the Society was a body corporate, and was registered as a limited liability company. To be exact, the R. P. S. is a company, whose liability is limited by guarantee, and it exists by licence granted by the Board of Trade, under Sec. 23 of the Companies Act, 1867. Limited Liability Companies are either governed by a set of provisions known as Table A, or else wholly or partly by their own articles of association. If they wish to be wholly governed by their own articles of association, they must specifically bar Table A in their articles of association. There is nothing in the R. P. S. articles of association barring Table A, and therefore, except where excluded or altered by these articles, Table A will apply. The reference is Sec. 15 of the Companies Act, 1862, which reads:—"In the case of a company limited by shares, if the memorandum of association is not accompanied by articles of association, or, in so far as the articles do not exclude or modify the regulations contained in Table A in the first schedule hereto, the last-mentioned regulations shall, so far as the same are applicable, be deemed to be the regulations of the company, in the same manner and to the same extent as if they had been issued in articles of association and the articles had been duly registered." There are no provisions as to proxies in the articles of the R. P. S., therefore Sec. 48 of Table A applies. This reads:—"Votes may be given either personally or by proxy." We venture to think that this is a matter that country members who are unable to come to town for the meetings should carefully attend to, and the fact that no proxies were lodged for Tuesday's important meeting is, we think, sufficient excuse for bringing the matter forward. Mr. Heissett carefully pointed out that country members took very great interest in their Society's work, and, doubtless, the due recognition by them of this privilege which belongs to them can only act for the good of the Society. While on the subject, it may not be out of place for us to point out that if country members intend to send up proxies for the confirmatory meeting to Tuesday's resolutions—which, by the bye, cannot be held within fourteen days of that meeting—they should note the following regulations, which govern proxies:—A proxy for a specified meeting must bear a penny stamp, either impressed or adhesive; if adhesive, it must be cancelled by the person by whom the instrument is executed. The Stamp Act, 1891, Sec. 80 (1) prescribes that every instrument appointing a proxy "is to specify the day upon which the meeting at which it is intended to be used is to be held and is to be available only at the meeting so specified, or any adjournment thereof." Moreover, Table A, Sec. 50, says:—"The instrument appointing a proxy shall be deposited at the registered office of the Society not less than seventy-two hours before the time for holding the meeting at which the person named in the instrument proposes to vote." In practice, forty-eight hours is now commonly prescribed. We sincerely trust that this memorandum may lead many country members to register their votes, and thus knit the Society in a closer bond of union than now exists.

It is unfortunate that amendments cannot be moved at the confirmatory meeting, but if members either wish to support or oppose the resolutions now standing—in other words, to propose amendments, this can still be accomplished by twenty members demanding that a special meeting be called, and specifying the purposes for which such meeting is to be summoned.

* * *

The Society of Arts.

The opening meeting of the 148th session of the Society for the Encouragement of Arts, Manufactures, and Commerce will be held on Wednesday evening, November 20, when an address will be delivered by Sir W. H. Preece, K.C.B., F.R.S., Chairman of the Council. The session's arrangements include at least four items which should greatly interest photographers. At one of the meetings after Christmas Sir William Abney, K.C.B., D.C.L., is to discuss "Recent Work in the Photography of Colour." The Juvenile lectures, as we briefly announced last week, will be delivered on January 1 and 8, 1902, by the Secretary of the Society, Sir H. Trueman Wood, M.A., on "Photography and its Applications." There will be two series of Cantor lectures. On March 3, 10, and 17 Mr. J. D. Geddes will take for his subject "The Application of Photography to Printing," and on April 14, 21, 28, and May 5 Dr. R. T. Glazebrook, M.A., F.R.S., will deal with "Glass for Optical Instruments." We are glad to see a continuance of the close association of the Society of Arts with photography. Amongst the other subjects of papers during the session will be "Aluminium," by Professor Ernest Wilson; "Range Finders," by Professor Geo. Forbes; "Elliptographs," by F. I. Gray; "The Use of Balloons in War," by Eric Stuart Bruce. The programme is a full and varied one.

* * *

How is the Image Formed on P.O.P.?

A short paper contributed to the "Photographische Mitteilungen" by Dr. Lüppo-Cramer once again exemplifies the fact, so often met with in photography, that it is easier to invent valuable commercial processes than to give a scientific explanation of the way in which the result is obtained. When an image is formed by exposing a sheet of printing-out paper to the action of light, what are the reactions that take place? Dr. H. W. Vogel endeavoured to explain the fact by stating that the nitrate of silver, which was added to the emulsion, combined with the chlorine liberated by exposure to light, and formed a fresh supply of silver chloride, which in turn was reduced by light action. The repetition of this process built up the image. Dr. Lüppo-Cramer claims to have proved by his experiments that the liberation of chlorine from silver chloride is not favoured by the presence of silver nitrate; also that an addition of citric acid produces little effect. But he finds that there is very strong reduction when citrate is present with silver chloride. This is confirmed by experience, for it is found that silver citrate

must be used to produce P.O.P. giving a vigorous image. But it is peculiar that silver chloride alone will not give a strong print, and that silver citrate is still less sensitive to the action of light. Nevertheless the union of these two salts gives the desired result. Dr. Lüppo-Cramer suggests that the absence of any action by silver nitrate might be due to the formation of nitric acid, in a manner resembling Eder's explanation of the effect of fuming paper with ammonia, which kills the nitric acid. If the absorption theory were correct, as stated in its simplest form, then a substance that absorbs chlorine without giving off nitric acid should promote reduction in a higher degree. But experiments, in which ammonia was added to the silver chloride, instead of silver nitrate, and likewise others, in which ammonia-silver oxide was substituted, did not give results that could be compared with those obtained by the action of the organic silver salts.

* * *

Sepia Platinotypes by Cold Development.

Baron von Hübl, whose name is well known in association with this most beautiful and permanent printing process, gives the following instructions in the "Photographische Correspondenz" for the production of sepia tones. The feature of the process consists in using a citrate of mercury, instead of bichloride. Take a gramme of yellow oxide of mercury and 5 grammes of citric acid, add 20 c.c. of water, and dissolve by heat. Filter the colourless fluid. This is kept as a stock solution for addition to the sensitising bath. The paper should be prepared with arrowroot, and sensitised with

8 c.c. of normal iron solution,
4 c.c. of platinum solution, 1 in 6,
1 to 4 c.c. of citrate of mercury solution.

The addition of a little citrate or oxalate of ammonium will keep the high lights pure, and the gradation may be modified by adding sodium chloro-platinite, or bichromate of potash. The paper should be sensitised in the usual manner. The developer should be strongly acidulated with oxalic acid, and the strength of the solution of oxalate of potash may vary between 12½ to 25 per cent. The formula may be stated as follows:—

Water .....1000 c.c.
Neutral oxalate of potash..120 to 250 grammes.
Oxalic acid ..... 10 grammes.

The development may take place in a dish in the ordinary way, or a brush may be used. The prints must, however be at least 5 minutes in contact with the developer to effect complete reduction, otherwise they will lose considerably in the fixing bath, which should be a 1 per cent. solution of hydrochloric acid. Leave the prints for half an hour in the fixing bath, and then wash thoroughly. The colour and gradation of the image may be modified considerably by the composition of the sensitising solution, the developer, and the peculiarities of the paper used. In Baron von Hübl's work, "Der Platindruck," the normal iron solution is given as composed of 20 per cent. of ferric oxalate, to each 100 c.c. of which 1 to 2 grammes of crystallised oxalic acid are added.

* * *

The Use of Glycerine in the Platinum Process.

Following upon Baron von Hübl's remarks, we have the report of a paper read by Raimund Rapp before the Photographic Society of Vienna. In it he described to the members his method of controlling development, and, as a successful worker, his procedure may not be without interest to our readers. The equipment consists merely of four or five flat and round brushes, three dishes, glycerine, a solution of oxalate of potash, and some dilute hydrochloric acid. The first dish is filled with glycerine, the second with a solution of oxalate of potash (1 in 3), and the third with a similar solution diluted to half strength. The prints should be made upon cold bath paper, and rather overprinted. For development, place the prints upon a sheet of blotting-paper, fastened to a drawing-board, and brush them over with glycerine evenly. Remove any excess of glycerine by means of a brush, and blot the print with filter paper. The solution of oxalate of potash is then applied by means of the brushes. The dilute solution should be used first. The concentrated solution may then be applied as circumstances dictate, either to the whole print, or locally, by means of the smaller brushes. If it is desired to retard the development of any portion of the print, this may be done by painting it with glycerine. When finished, transfer the print to a fixing bath of dilute hydrochloric acid, and finally wash.

* * *

Can a Plate be Developed through to the Back?

The discussion which recently took place at the London and Provincial Photographic Association, to which we drew attention, has elicited some comments from Herr Gaedicke, the Editor of the "Photographisches Wochenblatt." In his opinion the matter cannot be settled a priori, as it is known that light is absorbed in its passage through the film, and it is possible that by the time the surface of the film next the glass has received its full exposure the other may be reversed, in which case it would not be amenable to development. Moreover, we have, in the film, bromide of silver in very different states of sensitiveness, and this may be productive of a similar effect. But this would only be the case if development does not exceed the time usually taken in making a negative. If, however, the plate is immersed in a concentrated developer for some time, it may be presumed that complete reduction takes place, if exposure is so timed that the possibility of reversal is excluded. We may, however, point out that this opinion is a priori also, and we would suggest to the London and Provincial Photographic Association that some member should make a series of test experiments.

* * *

The Gurtner Process in Natural Colours.

It is announced in the "Photographische Chronik" that the alleged offer of 700,000 francs, said to have been made to Herr Gurtner for his photographic process in natural colours by a Berlin syndicate, is not a fact. But it appears that a representative of

Herr Gurtner connected with a Zurich firm has been in Berlin, and has placed the invention before various large firms, including C. P. Goerz. As he could not show any specimens, or give any information concerning the process, no negotiations could take place. Even inquiries in Bern have not elicited any information concerning the sensational invention, and no application for patent has been made. The "Chronik" remarks that we must now wait until Herr Gurtner gives further information and some proof of the possibility of the process. Meanwhile the announcements in the daily press should be regarded with suspicion. Apparently the Gurtner process is passing through the same stages as other so-called discoveries of photography in natural colours.

* * *

The New German Tariff. It would be difficult to find a more sarcastic indictment of the proposed new tariff, than the following, taken from the "Süddeutsche Chemiker Zeitung":—"It is not extraordinary that soda should still be protected with a duty of pfg. 90 to M. 1.50, according to degree of moisture and purity, when we remember that the output of soda has increased from 42,000 tons in 1878 to 100,000 tons in 1884, and 300,000 tons worth 27 million marks, in 1897. What kind of feelings must be excited if it is still thought necessary to maintain a duty of M.3 on sulphate of ammonia, when Germany produces one-fifth of the entire output of the world? But the most ridiculous thing is that there should still be protective duties upon dye stuffs, when more than half the produce of the country is exported. To proceed in this short-sighted manner is to incite aggressive measures against our industry in coal-tar dyes, which in three factories alone gives employment to 13,800 workmen and 48 million marks capital. The exports of this industry since 1898 have risen from 38 to 75 million marks. The exports of alizarin alone have more than doubled since 1883, rising from 4000 tons to 9600 tons in 1899. Yet, what is this compared with the increase in the manufacture of aniline and coal-tar dyes, which has risen from 660 tons in 1883 to 23,781 tons in 1900? In 1893 660 tons of aniline oils and aniline salts were exported, but in 1900 the quantity had increased to 12,613 tons. We have almost beaten the English trade in varnish and lacquer out of the field, and have driven all competitors out of the home market, yet duties ranging from 3 to 30 marks are still imposed upon all kinds of varnish, lacquer, and cements, with exception of asbestos paints and similar kinds of asbestos preparations." If we look at another series of duties, we find compressed gases, inclusive of the steel cylinders, charged with a duty of 6 marks, although Germany is the centre of the industry, employing 42 factories, with 35 million marks capital. Moreover, a strong syndicate fixes the prices, and the liquified gases are exported to all countries. The examples might be multiplied, but surely they are enough to point out the want of ingenuity in the compilation of the tariff." There are a number of people abroad who are smiling to themselves that Germany should have no more cunning than to close its borders. Our active competitors know full well that if the doors of our country are closed to imports, the doors through which our exports pass will also close automatically.

THE COMMERCIAL ASPECT OF PICTORIAL PHOTOGRAPHY.

It seems doubtful if photographs possessing pictorial qualities will again become commercial commodities to any great extent. Mr. Louis Wilson, director of the view-publishing firm of G. W. Wilson and Sons, of Aberdeen, says:—"As far as the class of photograph with which my business is concerned, viz., landscapes and 'local views,' I can say, without hesitation, that the point of least importance affecting sales is that of pictorial quality. Subject, price, size, 'up-to-dateness' and clearness are the important points. From a commercial point of view, it is equally unimportant whether a photograph is an artistic gem or violates every law of composition and light and shade. This unsatisfactory opinion is the result of many years' painful experience, and every year confirms it."

Other well-known workers have, in the main, corroborated Mr. Louis Wilson's statement, although an exception must be made in regard to certain seascapes, and some photographs of animals. Some years ago, photographs which took the public fancy sold in their thousands—hundreds of thousands in some cases. Now, with one or two exceptions, pictorial photography (landscape and figure studies) is a pleasant pursuit, but an unremunerative one. Photographs of Royalty and celebrities (including actors and actresses) are sold in considerable quantities, but these would hardly come under the category of pictorial photographs, in the generally accepted meaning of the expression. If we turn to the exhibition catalogues, it will be found that the prices for the pictorial exhibits vary from half a guinea to twenty guineas. Mr. Steichen very modestly asks ten guineas for a self-portrait; and he is probably of the opinion that it is cheap at the price. If he succeeds in disposing of his "masterpiece" at that sum, he will probably induce others to take up the self-portrait business. The margin of profit should prove remunerative. At the recent exhibition at the Dudley Gallery, Mr. J. C. Warburg asked a guinea for a diminutive photograph entitled "A Moot Point." The title was not inappropriate, although, to be sure, the question of size is not the chief consideration in connection with works of art. There were several exhibits at the Salon the prices of which many would consider rather dear. It would be interesting to know who acts as valuer, the exhibitor or a member of the Hanging Committee—presumably the former. Several of Mr. Steichen's works were priced at five guineas and ten guineas respectively. This should be encouraging to the as yet unhung. But, of course, it is easy enough to put a price on any work, and quite another thing to obtain it. Dr. Hugo Henneberg found a purchaser for his excellent work, "Stream near Dachan," the price being nine guineas. The highest priced exhibit was Mrs. Gertrude Käsebier's "Manger," about which several somewhat conflicting stories have been told. It could be purchased for £20. Mr. Hinton's price is usually £3 3s. Several of the exhibits at the Salon found purchasers. The average annual total value of the sales is about £60.

At the Royal Photographic Society's Exhibition two of the medalled works, the dainty little exhibits entitled "An Old Kitchen," by Mr. Bernard Moore, and "The Spinet," by W. Gill, F.R.P.S., were both priced at a guinea. Carbon was the medium employed in both cases. Another medalled work, "The Quarry Team" (carbon), by Archibald Cochrane, certainly one of the most striking of the pictures hung,

could be purchased for five guineas. "A Street in Chioggia" (platinum), by Percy Lewis, also medalled, was valued at £3 10s. As at the Salon, the prices of the exhibits varied very considerably—from half a guinea to ten guineas. It is the fashion for certain art critics to sneer at and ridicule the expression pictorial photography, and while it is of course, true that a photograph possessing pictorial qualities could not be produced without the instrumentality of the lens and the sensitive plate, the exercise of a considerable amount of knowledge, taste, and skill is essential to produce a photograph which will satisfy the æsthetic sense, and which will appeal to the beholder apart from any topographical or personal associations. While some photographers would claim too much for their work, certain artists and art critics, on the other hand, would deny too much. As to whether pictorial photography will ever be included among the fine arts, is a subject which has given rise to extensive discussions. As a matter of fact, it might fairly be considered that it is now so ranked already. At any rate, the Autotype Company publish a selected series of photographs with the reproductions of famous paintings at practically identical prices. In the beautifully illustrated catalogue published by the Autotype Company several miniature reproductions from notable photographs appear with similar reproductions from famous paintings.

Of course, from an art point of view, there will always be a great gulf fixed between the work that is chiefly a product of the lens acting on a sensitive medium and the work that is from the conception to its completion the product of an artist's brain. While this fact must be admitted—indeed, it should never be questioned—it is nevertheless indisputable that the production of a pictorial photograph gives considerable scope to the producer, thus introducing the personal element; and, if subsequent manipulation of the negative is permissible, the possibilities are endless. But whether in the latter case the product would still rank as a photograph is a disputed point. The question might be asked, if it is desirable to alter the character of the negative to the extent that some workers advocate, why use the lens at all? Some of the effects produced by one or two American "photographers" could have been much more easily obtained by anybody possessing a minimum of skill, by the aid of a little sepia and a camel's-hair brush, or perhaps a hog's-hair brush would be more suitable. No one would say that the class of photograph (landscapes and local views) sometimes contemptuously described as the "usual thing" is the ideal from an art point of view, but if the purchasing public is indifferent to the higher attributes of a pictorial photograph, is the producer and publisher of views justified in incurring the extra expense that the production of "pictorial photographs" would necessitate? The experience of Mr. Louis Wilson given above should carry weight in this connection. Of course, a pictorial photograph need not of necessity be topographical, but it must be admitted that a topographical view can possess pictorial qualities. Those who appreciate pictorial qualities in photographs are usually themselves photographers. A considerable amount of pleasure is derivable from the pursuit of pictorial photography, apart from any commercial consideration, and this, to a great extent, explains its popularity. But those who practise pictorial photography, and who can appreciate the photographs produced by their fellow-workers, are not, I think, purchasers of pictorial photographs to any great extent. The market is consequently a limited one, and, as things are, the pictorial photographer who succeeds in disposing of his works for five or ten guineas, or less, as the case may be, must be considered fortunate.

THREE MORE NEW PAPERS.

[A paper read before the members of the Croydon Microscopical and Natural History Club.]

Last month I brought under your notice three new printing papers, and to-night I have a few words to say about three more, i.e., automatic, Columbia, and metalotype, the two first being printing-out papers, while the last is a development paper.

Taking the automatic paper first, it will be found an easy paper to print, not taking much time, and it needs to be only printed a little darker than the finished print is required to be, and it can be had either with a glossy or matt surface. This done, three courses are open, the print may be at once placed in the fixing bath, which is composed of hypo 3 ounces, to 1 pint of water, for five minutes, and then washed. By this treatment a pleasing red colour is obtained, but the printing wants carrying a little further in this case than in the other two. Or the print may be placed, with or without previous rinsing (*not* washing) in water, for 15 seconds in a salt bath, composed of 12 grains of common salt to each ounce of water—this scarcely visibly affects the look of the print, and then into the hypo bath as described above. A nice warm brown results from this treatment. Or, the print may be kept in the salt bath for from 30 to 60 minutes, then proceed as before. A colder tone is thus obtained; indeed, the colour can be varied, according to the strength of the salt bath, and the length of time it is immersed therein. In either case, the process is completed by thorough washing for 1 hour, either in several changes of, or better still by running water. I show you some prints done on this paper, and will presently proceed to demonstrate the different processes.

Columbia paper is, like the Paget Self-toning paper described last time, a collodion paper, and therefore requires careful handling, but beyond this it is a remarkably simple and easy paper to work, the gold necessary to produce the tones being pre-existent in the emulsion. It can be obtained as glossy, matt, or extra thick matt, and the same formulæ and general treatment are applicable to all three varieties, which is in itself a decided advantage; added to which the *only* processes to which the print has to be subjected after leaving the frame, are fixing and washing, no intermediate salt bath being required. Either the ordinary hypo bath may be used, strength 3 ounces to 1 pint of water, or if darker tones are desired, then add to this about 10 grains of citric acid. Fix for 10 minutes, and wash for 1 hour. I show you prints of this, and will develop some presently.

Columbia gas-light paper is, as its name implies, a development, paper, and is very pleasant to work with, as you will see presently. The only difficulty is the usual one of exposure, but this is easily arrived at without much trouble; for instance, here are two prints, I judged the exposure at 30 seconds for the lower portion, giving an extra 15 seconds to the upper portion consisting of the tops of trees, the lower part being shaded meanwhile; on development this proved too little on the whole, though the proportion was right, therefore by giving 45 seconds plus 15 seconds, a very good print resulted. (Shown.) This was the result of my very first attempt with this paper. Rule, give enough but not excessive exposure, and stop development by instant transfer of the print into the fixing bath. The developing solution used was the metol-hydroquinone (the same as the next paper I shall have to refer to), but an amidol developer may also be used. The fixing bath is *not* the usual one, but is made by dissolving 4 ounces of hypo and ½ ounce of alum in a pint of water, and allowing to stand, or filtering, till clear. (This fixing bath also does for the next and last paper.) One peculiarity to be noticed about these papers is the effect of bromide of potassium in altering the colour of the resulting print, thus a minimum quantity gives a blue black, while by increasing the amount, a more and more tendency to olive green results.

Lastly, I have to notice quite a novelty in the way of development papers, i.e., metalotype. This is also issued by the Columbia Com-

pany, and the general instructions given for the last paper are applicable to this, except that it requires longer exposure. Thus, on testing a piece with a negative very similar to the one used above, I gave three exposures on one piece of paper, i.e., 1, 2, and 3 minutes at 6 inches from a No. 5 Bray. This proved that 3 minutes was right for the lower portion, but not the upper; therefore I gave 3 minutes plus 2 minutes, and obtained a capital print. Other prints had from 2 plus 2, to 3 and 4 minutes, and in each case was a good print secured. I show you all these results so that you can judge for yourselves. Looked at in a good light, well reflected from the metallic surface of the paper, these prints look very well, but if looked at sideways the effect is not so good, being rather leaden. Through the kindness of the Columbia Optical Company, 42, Goswell-road, London, I am able to distribute a number of beautiful prints on their papers, from which you will be able to judge of the varied effects to be obtained on them. J. H. Baldock, F.C.S.

CHROMATIC PLATES.

[Reprinted from "Photographic Scraps."]

Thanks to the untiring energy of experimenters and manufacturers, we can buy chromatic plates, and screens to use with them, and, if these notes on their use are reasonably followed, I am confident that many workers, however good their prints may have been, will be both surprised at and pleased with the improvement in their results. To any amateur about to take up photography, who wants a sound, safe plate to start with, I unhesitatingly say try chromatic, except, of course, for fast snap-shot work. I have this summer exposed some on children at f-11, speed one-fortieth second (without screen, of course), with very pleasing effect, and on looking over my note-books I find that most of my best negatives are on Ilford chromatic plates. Some of my exposures in South Africa were slowest instantaneous f-32, 3 seconds f-64 without screen, but with No. 1 Ilford screen I obtained splendid results, usually with f-32, giving 3 to 4 seconds' exposure, getting both landscape and clouds. Of landscape work in England, with the screen, I have not any wide experience, but have used it constantly in the studio on flowers, etc. I would strongly suggest the following simple experiment to demonstrate the advantages to be derived from using Ilford chromatic plates "backed." Provide yourself with a No. 1 Ilford screen; choose any subject that appeals to you—a landscape, a spray of flowers, a red brick cottage, if you will; load your dark slides, one with your usual brand of plate, and one with "backed" chromatic, making notes in your book of numbers and kind of plate. We will suppose you have chosen a spray of red roses; arrange your subject at a north window, with an uninterrupted light, at, say, 18 to 24 inches from the sill; next erect your camera, parallel with the window-sill, and focus as sharply as you can, without any stop in; next insert stop f-32, and expose one of your usual plates for your usual exposure, and to prevent any confusion in judging results develop and treat this plate exactly as usual. Let your second exposure be one of the backed chromatic, and without any change or rearrangement whatever, expose f-32 for 90 seconds—any other light than a good north light would require modifying, but 90 seconds with f-32 will not be far wrong. Let your third exposure also be a chromatic, but fix your No. 1 screen in position and re-focus through screen, taking great care that your screen is quite parallel with the lens, proceed as before, first with open aperture, and then inserting f-32, taking care that your camera, stand, and subject have not been moved, and that the same petal or stem, or some particular part, is the same part that you focussed most sharply in the two previous exposures. An excellent plan is to drop a tiny tuft of coloured cotton-wool lightly on that part of the spray or blossom on which you adjust your principal focus, and focus that, removing it, of course, before exposure. The No. 1 screen increases the exposure 3 times, so multiply your last exposure by 3, say, $90\times3=270$ seconds. If you care to carry your experiment further, change your screen for a No. 2, and double your last exposure, 540 seconds.

Before proceeding to development let me describe a very simple arrangement which entirely prevents fogging the plate. Procure a box the size of those in which packets of Quaker Oats are packed; any grocer will let you have one (without lid); paste a stout sheet of brown paper all over the inside, or give it two coats of dark paint inside and out. On this box—standing on one of its sides on your developing sink or table, inside towards you—place your dark-room lamp with one sheet of ruby glass; do not bring the lamp forward, but let it remain as far towards the back of the box as possible. Your developing tray should rest on the bottom of and inside the box. Your bottles of developing solutions, No. 1 pyro, and No. 2 soda and bromide, find safe resting places inside at each corner, and there is nothing to knock over in the semi-darkness. You can always easily find them by feeling, and the box serves as a safe place and a safe light in which to fill dark slides, no direct light from the lamp (and mine is a large one) falling on the plates, either during the time the slides are being filled or during development, the front edge of the box on which the lamp rests preventing that.

Now as to development, mix your solutions in accordance with the Ilford formula thus:—

No. 1.

Water	5½	ounces.
Potassium metabisulphite	70	grains.
Pyrogallic acid	¼	ounce.

No. 2.

Sodium carbonate	2	ounces.
Sodium sulphite	2	ounces.
Potassium bromide	20	grains.
Water to make up to	20	ounces.
Take of above No. 1	1½	ounces.
Water to make up to	20	ounces.

We will suppose you have been exposing quarter plates; take your 2 oz. measuring-glass and place it on front edge of box until it is level with your eyes and in front of the lamp, so that the divisions and figures are easily seen. Measure out ½ oz. of No. 1 pyro solution and return bottle to its corner of the box, next add ½ oz. of No. 2 soda, and 10 minims of a 10 per cent. solution of bromide of potassium, and make up to 2 oz. with water. Place plate in developing tray at bottom of box, and the better to watch development draw the peak of a soft cloth cap well over the eyes, pour on developer, gently rocking the while, and watch, you can easily see what progress is being made, without at this stage exposing the plate to any direct rays from the lamp. When the plate begins to darken, pour off the developer into your measuring-glass and raise the plate nearer the light to examine. Continue development until you can see the rebate margins of the plate turn in the slightest degree grey, at once throw off the developer and allow water from your rose to gently wash the plate for, say, a minute, without removing it from the tray. The box on which the lamp rests prevents any direct light from falling on the plate. Do not grope about with your fingers to raise the plate out of the developing dish in which it is washing, but lift by means of an ivory paper-knife blade or tooth-brush handle filed flat and thin, and hold the plate by the edges for the briefest possible time. Put the plate in your dish of hypo (4 oz. to 20 ozs. of water). Should the weather be very hot—I have developed these plates with the thermometer at 92° Fahr.—first place your plate in a saturated solution of alum, to which add 3 drachms nitric acid per 20 ozs. for, say, 3 minutes, and after well washing under the rose, fix as above, but do not use the alum bath unless it is indispensable to prevent frilling. In this matter of fixing first or aluming first, the thermometer must be your guide. I have only on two or three occasions in the past summer found it necessary to alum first, but then I am careful not to handle my plate more than is absolutely necessary. I never hold a plate in my hand while washing, but always in a tray, as frilling invariably starts from the point of contact between warm fingers and a plate.

After fixing and aluming, give the final washing, and develop your third plate in precisely the same way. Many readers may possibly consider development not carried far enough, but I would ask them to try it, and, if their lens be a good one, they will have negatives that will enlarge (critically) to 15×12.

For the purpose of our comparison the three negatives should be marked, placed in three separate printing frames, exposed to light and withdrawn simultaneously, and the prints toned together in the same bath.

It will be found that much better results are in all cases obtained with chromatic plates, and the best possible results are secured with both chromatic and screen. A. R.

KODAK, LIMITED.

A general meeting of the ordinary shareholders was held on Tuesday at Winchester House, Sir James Pender in the chair, to consider a resolution to the effect that, having regard to the agreement dated the 31st ult., made between Mr. T. Hallett Fry, on behalf of the company, of the first part; Sir J. Pender, Lord Kelvin, and others, of the second part; and the Eastman Kodak Company, of New Jersey, of the third part, Kodak, Limited, be authorised to pass a special resolution reducing their capital to £250,000 in £1 shares. The Chairman, in proposing the resolution, stated that the great prosperity of the company was chiefly responsible for their present difficulty. The income-tax on the profits derived from the British, Continental,

and Colonial businesses for last year at 1s. 2d. in the pound amounted to about £7,000; but the authorities asked the company to pay tax on the profits of the American company also. It had been generally considered that in respect of profits made on a separate business abroad the proprietor was only liable to be taxed upon so much of his profits as he received in this country. If his profits were disbursed abroad he paid no tax here. In this case not a penny of the American profits had come to England, as they were required in America to pay dividends to their American shareholders. The company owned a very large block of the shares of the American company—roughly, about 98 per cent.—but other shareholders owned the remaining 2 per cent. This minority were American citizens, who were not even shareholders in Kodak, Limited. Further, the authorities desired to tax the undivided profits of the American company. The Eastman Kodak Company existed before Kodak, Limited, was formed, but the Income-tax Commissioners had treated the American company as if it had been called into existence by this company, and was a mere cover for the latter's own convenience. He did not want to discuss the question of whether in law the Commissioners were right or wrong, because the case was before the Courts, and some day a legal decision on the point might be expected. At that meeting they could only consider the matter from the practical and commercial side. Before the shareholders of the Eastman Company sold this company a controlling interest in their company and took Kodak shares in payment, the question of their liability to have income-tax deducted from dividends was discussed, and eminent counsel advised that there would, under the existing conditions, be no liability. On the faith of this opinion—which had since been confirmed by other eminent counsel—the sale to this company was concluded. When, however, the Commissioners decided against the company, the board had no option but to direct their American agents to deduct the tax from American dividends, knowing at the same time that the deduction would be regarded on the other side as a breach of good faith. The disinclination of the American shareholders to pay the tax was no mere sentimental one, but a question of pounds, shillings, and pence. Let them consider the matter as it affected British shareholders. More than three-fourths of the company's ordinary shares and nearly half their preference shares were held in America. It was their business to extend their operations in every profitable direction. They now had an opportunity of taking over some valuable competing concerns, which would strengthen their business, but the tax question blocked the way. He did not know if these concerns could be bought for cash or not, but it was this company's policy to pay in shares, and the owners would not sell to the company for shares in circumstances rendering them liable for the tax. The directors believed that the proposed combination was good for the consumer as well as for the producer, as it would, in their opinion, lead to better goods and lower prices. He wished emphatically to state that they did not desire to create a monopoly in photographic goods. Their policy to-day was the same as that of the past, and it had met with marked success. In furtherance of this policy a combination was formed in 1899 of some of the principal photographic printing paper businesses in America, including the paper branch of the Eastman Company, under the title of the General Aristo Company. The Eastman Company received shares for their paper business and also subscribed to the General Aristo Company's capital, the remainder of which was subscribed almost entirely in America. An option was, however, secured by Kodak, Limited, to acquire all the shares of the General Aristo Company within a certain time in consideration of an exchange of the latter company's shares for the shares of Kodak, Limited, on a basis of valuation of profits. The time for absorbing the General Aristo Company had now arrived. The profits for 1900 of that company amounted to £145,000, equal to 7 per cent. on their preference capital and 23 per cent. on their common stock. On the agreed basis of exchange, the General Aristo Company would be entitled to 1 1-6 new 6 per cent. preference shares for their 7 per cent. preference share and about 1.80 new ordinary share for each of their present ordinary shares. What was accomplished in 1899 in regard to the photographic printing paper businesses it was now desired to accomplish in respect of some competing dry plate and photographic material companies in Europe and America, and the directors believed that satisfactory arrangements could be made with all of them. Their accounts showed large reserves of tangible assets, and their total earnings for 1900 were about £250,000. It was only right to say that none of these businesses were in the market. The profits of the new company, if all the businesses proposed were combined, would justify the payment of a dividend of 10 per cent. on their ordinary shares, after paying the preference dividend on all the shares which it would be necessary to issue to cover the complete scheme, and leave a margin over of about £150,000 for the year. The profits had risen year by year. The ability to pay 10 per cent. on the ordinary shares would be very little affected either way by the exclusion of one or more of the companies he had mentioned; in fact, to take an extreme case, suppose they did not take any of them, the amalgamation of the Kodak associated companies with the General Aristo Company would still show a surplus of about £100,000 after paying 10 per cent. on the ordinary shares. He might point out that a dividend of 10 per cent. on the ordinary shares of the new company would mean to the shareholders of Kodak, Limited, 25 per cent. on their present holding. While, however, the income-tax imposition blocked the way, any exercise of the company's General Aristo option or any other such combination was impossible. The addition of the foreign profits would, in existing conditions, add nearly £23,000 per annum to the tax, and this the vendor companies refused to submit to. As a matter of sentiment the directors would prefer that the industry should remain under a British constitution; as a matter of business, the proposed transfer to an American corporation was without serious objection. The paramount question was that of management, and in this respect there would be practically no change. The general effect of the proposal was the sale of the company's undertaking to the new American company on the basis of an exchange of shares; and the continuance of the existing company with a reduced capital was merely a method of arriving at that result with the least possible disturbance to the business. The shareholders would receive at the rate of £2 10s. in new ordinary shares for one Kodak ordinary share and £1 1s. in new preference shares for one Kodak preference share. The directors had arranged for paying cash instead of shares at the rate of £2 10s. for the ordinary and £1 2s. 6d. for the preference shares, approximating to their market price when the arrangements were made. Lord Kelvin, in seconding the motion, stated that out of a possible 1,000,000 votes in the ordinary shares, the directors had received proxies in favour of the proposal for 942,338 votes, and out of a possible 600,000 votes in the preference shares proxies had been received for 457,393. Mr. Winch asked whether, if the company were formed into an American company, the English shareholders would have to pay the taxes which the United States Government might demand. Other shareholders having addressed the meeting, Mr. Verden (the solicitor), in reply, stated that at the time the arrangement was proposed the estimate which the market put upon the value of the shares, with the knowledge of the existence of the company's reserve fund of £500,000, was the same as that now offered to the shareholders. That day, however, the shares stood at a higher price in the market. Beyond their nominal value, there would be no liability on the shares in the new company. There was no income-tax in America. The only tax of a similar character in the State of New Jersey was the franchise tax, but, of course, there were local rates and taxes. The franchise tax was a yearly sum fixed by the State, and it was based on the nominal capital of the company. Of the proposed new company's nominal capital of $35,000,000, the annual franchise tax, taking the pound sterling at $4.84c., would amount to about £1134. Taking that sum as a tax on the profits shown in the statement circulated, it represented something less than ½d. in the pound, and this would be paid out of the company's general resources, and not deducted from the dividends. The resolution was carried.

A meeting of the preference shareholders and an extraordinary general meeting was afterwards held, at which the resolution was also passed. Mr. George Eastman, managing director, said that there was something of a popular idea abroad that it was their ambition to create a monopoly in the photographic trade. The dictionary definition of "monopoly" was "the exclusive right, power, or privilege to engage in any particular traffic or trade, or the resulting absolute posession or control." That was not what they were striving for, and if it were it would be impossible to get it. But any part of the photographic trade which they could get by giving the customer better and cheaper goods than any one else, or by giving the dealer a better profit so that it would be to his interest to push them—that part of the trade they were after, and however much of anti-monopoly cry might be raised by their competitors, it was not likely that they would slacken their efforts. That kind of monopoly was good for society at large, and just so far as it was good for it would society encourage and permit it and no further.

ROYAL PHOTOGRAPHIC SOCIETY: THE SPECIAL GENERAL MEETING.

A SPECIAL general meeting was held on Monday, November 11, at Russell-square, to consider certain proposed amendments of the Articles of Association, the gist of which was given in the President's annual address, which we printed in these pages a short time since.

Mr. Thomas R. Dallmeyer occupied the chair.

The interest of the meeting attached to the reception of a proposal to abolish the offices of Hon. Secretary and Hon. Librarian and combine their duties in one office—that of a paid Secretary. The question was at an early stage treated as one that could not be justified by the state of the Society's finances, and later the principle involved was the centre of an earnest discussion. Ultimately the motion for the

amendment of the Articles in this direction was defeated, the necessary three-fourths majority failing to be realised. A proposal to elect the Exhibition Judges solely from the members of the Society was also one of the important proposals. At present the members (who elect the judges) may return non-members as has often been the case, but the amendment, after a long discussion, was negatived, those in favour being unable to command the majority required by the clause in the Company's Acts concerning the alteration of Articles of Association. The suggestion that the ballot-paper for Council and officers should in future bear only the names of the nominees and not the nominators was the subject of protracted discussion, but eventually it was decided to leave the Article as it stands.

Several amendments of minor importance were adopted, amongst them one increasing the number of members for registration purposes to 1500. Nearly eighty members were present at the meeting.

EXHIBITION AT NEWBURY.

A PHOTOGRAPHIC exhibition is to be held at Newbury, under the auspices of the Newbury Guildhall Club, on January 29, 30, and 31, 1902.

Among the patrons are her Royal Highness the Princess Christian, Lady Jeune, Lady Wantage, Mrs. A. J. Carstairs, the Rev. J. M. Bacon, F.R.A.S., Mr. T. R. Dallmeyer, F.R.A.S. (the President of the Royal Photographic Society), Mr. J. N. Maskelyne, and Mr. Alfred de Rothschild. The competitions, for which prizes to the value of nearly £100 are offered, include eight open classes, a similar number of local ones, and two special prizes for novices. Sir Henry Trueman Wood and Mr. A. Horsley Hinton have consented to act as judges.

A novel feature, and one, we believe, introduced for the first time in an exhibition of this nature, is the pictorial post-card competition, prizes being offered for the best cards bearing a congratulatory message to the Secretaries.

Demonstrations of colour photography, Röntgen rays, the carbon process, etc., have been arranged, and frequent cinematograph and lantern exhibitions will take place.

Full particulars and entry forms may be obtained of Mr. E. J. Forster, Guildhall Club, Newbury, Berks.

EXHIBITION OF THE HACKNEY PHOTOGRAPHIC SOCIETY.

THE annual Exhibition of the Hackney Photographic Society was held at the Morley Hall, Hackney, N.E., on the 6th, 7th, and 8th inst.

It is a good sign when a Society shows increased activity in any direction. An increase of membership, an increase in the attendances at the meetings, an increase in the accommodation and conveniences at the headquarters are all healthy manifestations, but the most significant of all marks of progress is an increase in the quantity and quality of the pictures and in the number of exhibitors at the annual exhibition. The annual exhibition is, or should be, the crowning point of the year's work. The lectures, the discussions, and the outings may be pleasant and attractive, and may yet fail in furthering to any great extent the objects for which the Society was founded—the promotion of the knowledge of its members of photography as a science and an art, and their skill in its practice. The exhibition is the test of whether this work has been well or ill carried out.

Judged by this test, the Hackney Photographic Society has earned a place of honour. Year after year it has been our pleasing duty to record that the members have surpassed their efforts of the previous year. This duty again falls to us. This year's Exhibition was bigger and better than ever. As regards numbers, the members' classes contained only a few more pictures, but the fame of the Exhibition seems to have spread abroad, for there was an increase of considerably over a hundred frames in the open classes.

The members of the Hackney Society, speaking of them as a body, have now reached that stage of proficiency in photography that any very startling improvement in the course of a year is impossible; nevertheless they have progressed during the year at that steady rate they have maintained for some years past. As a whole, the members' side of the Exhibition compared very favourably with the side devoted to the open classes. There was not, perhaps, so much variety of subject, but then, although the number of pictures was within one or two the same, the members exhibiting numbered far less than half the exhibitors in the open classes, and it must be taken into consideration that some of the very best pictures in the open classes were contributed by members. It was perhaps a curious coincidence that the two gold medals, one of which is given on each side for the best picture, should have been awarded to the same exhibitor.

The judges were Messrs. R. W. Craigie, J. C. S. Mummery, and J. A. Sinclair.

To refer to the members' classes first, in the class for Portraiture and Figure Studies, there was a decided sign that more interest is being taken in this kind of work. This year it was classed by itself, instead of sharing a class with "Animals." W. A. I. Hensler had some figure studies, or, to use a word which seems to have gone somewhat out of fashion, "genre" pictures, which show promise. In one of these, "An Afternoon Visitor," a silver medal was awarded, and a certificate was given to F. W. Burt for "Tending the Bonfire." It is sometimes difficult to distinguish between a figure subject and a landscape with figures. Both S. C. Stean and J. O. Grant's pictures were pretty near the border line, but they were certainly among the best things in the class. The portraits were not very ambitious. One by G. Burton and one by W. Selfe appealed to us the most strongly.

The class for Landscape, Seascape, and River scenery showed no decrease in popularity. It contained 150 of the 240 pictures in the members' classes, and the work, as a whole, was distinctly creditable. A few of the members erred on the side of sending a considerable number of pictures instead of exercising a wise discretion in selecting the best of their work to represent them. One member, in particular, was conspicuously a sinner in this way. Of the twenty frames he sent, at least fifteen might have been withheld with advantage both to himself and the Exhibition. Including, as the class did, several pictures hung at the recent R.P.S. Exhibition at the New Gallery, and which met with general praise, it was satisfactory to note that a goodly proportion of the remainder were not outclassed. This shows that the work generally reached a fairly high standard. The two silver medals were both awarded to W. Rawlings for "Whitby Harbour" and for "Alas! alas! for the Winter's Snow," both pictures exhibited at the Royal, and commended by us in our review of that exhibition; but the highest distinction, the gold medal for the best picture in the members' classes, was obtained by G. H. Capper for a picture entitled "Clapton Pavement," in which a by no means romantic subject—a dust or snow-cart in a prosaic surburban thoroughfare in the mist-laden atmosphere of a winter day—was treated with that feeling which renders the most commonplace material picturesque. The picture was notable for its admirably kept tone values, and its composition was equally satisfying. Similar in its characteristics was "Rest," by W. Selfe, to which a bronze medal was awarded. Here again the wintry mist was admirably rendered, and the tone values well preserved. The subject, two horses on a wide expanse of marshland, was treated with a sympathetic feeling which conveyed a due sense of the forlornness of the scene. F. E. Roofe's "The Shadows Lengthen as the Day Draws On" was a subject of entirely different character. A pine wood, with the shadows from the bare tree stems cast towards the foreground. It was a difficult subject well managed, and as a composition very commendable, but still we think the most was not made of it as a picture. The cold blackness of the tint of the print seemed ill in accordance with the warm glow of a sinking sun, and the somewhat wiry definition also seemed out of keeping with the sentiment of the scene. Other notable pictures were "The Thaw" and "The Passing of the Storm," by W. A. I. Hensler, the former from the New Gallery; "On the River," by J. J. Westcott; "The Edge of the Wood" and "The Passing Hour," by S. C. Stean; "An Autumn Day," by G. H. Capper; and "Fallen Leaves," by W. Selfe. Dr. Roland Smith also had some good work, and with very few exceptions every exhibitor in the class deserved a few words of commendation.

The "Animal" class, as might be expected, was strongly reminiscent of the "Zoo," and it is difficult to infuse much pictorial quality under available conditions. J. O. Grant's "Lion," however, rose to the occasion, and well portrayed the nobility of the king of beasts. Many of the photographs were very good examples, indeed, of the class of work.

In Architecture, the Society has made wonderful progress, and many of the exhibitors showed themselves on the right track in treating their subjects as studies of light and shade rather than as topographical illustrations of stone work. W. A. I. Hensler received the only medal, but W. Rawlings and Dr. Roland Smith also showed high-class work, and G. Burton had a dainty little exterior view of old houses which deserved notice.

The open pictorial classes, as we have indicated, were well filled, and contained enough good material to occupy many columns were we to attempt any adequate review of it. We must content ourselves with acknowledging the fact that we are treating this portion of the Exhibition with undeserved neglect. In the class for Stereoscopic slides, an open class, L. S. Wilks, a member, quite ran away from the rest of the competitors.

The trade exhibitors were Messrs. J. Ashford, of Birmingham; Burroughs and Wellcome; R. and J. Beck, Ltd.; Burton and Sons, of

Bethnal Green, E.; H. and W. Cox, Ltd.; F. J. Dadd and Son, of Hackney; Kamm and Co.; Kodak, Ltd.; Matthey and Crabb; the Process and Engineering Co.; Sanders and Crowhurst; Seabrook Bros.; R. W. Thomas and Co., Ltd; and the Warwick Dry Plate Co.

LIST OF AWARDS.—MEMBERS' CLASSES.

Best Portrait in Classes A to D.—Gold medal, G. H. Capper.

Class A.—Portraiture and Figure Studies.—Silver medal, W. A. I. Hensler.

Class B.—Landscape, Seascape, and River Subjects.—Silver medal, W. Rawlings; ditto, W. Rawlings; bronze medal, F. E. Roofe; bronze medal, W. Selfe.

Class C.—Animal Studies.—Bronze medal, J. O. Grant; bronze medal, W. Selfe.

Class D.—Architecture.—Silver medal, W. A. I. Hensler.

Class E.—Lantern Slides.—Silver medal, W. A. I. Hensler; bronze medal, Roland Smith; certificate, R. Beckett.

OPEN CLASSES.

Best Picture in Classes F to H.—Gold medal, G. H. Capper.

Class F.—Portraiture and Figure Studies.—Bronze medal, J. Auld; bronze medal, E. T. Holding; bronze medal, T. P. Padwick; certificate, J. Spark; certificate, J. D. Shiels.

Class G.—Landscape, Seascape, and River Subjects.—Silver medal, E. W. Taylor; bronze medal, J. M. Whitehead.

Class H.—Architecture.—Silver medal, H. C. Leat; certificate, Miss A. B. Warburg.

Class I.—Stereoscopic.—Silver and bronze medals, L. S. Wilks.

Class J.—Lantern Slides.—Silver medal, H. Wild; bronze medal, F. E. Roofe; certificate, H. T. Malby.

Best Trade Exhibit.—Silver medal, Burroughs Wellcome and Co.

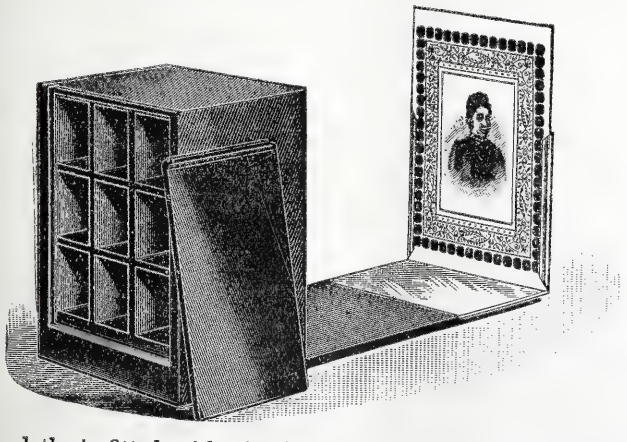
Most useful Photographic Novelty.—Bronze medal, Wm. Burton and Sons, for "Synthol."

Our Editorial Table.

THE "HOLBORN" STAMP CAMERA.

Manufactured and sold by George Houghton and Sons, 88 and 89, High Holborn, London, W.C.

BY means of the "Holborn" stamp camera nine stamp photographs can be included in a quarter-plate negative by copying from any C.D.V., cabinet, quarter-plate, or other small size photograph. Direct photographs can also be taken. The camera, which is covered in



black cloth, is fitted with nine lenses, and has a sliding holder, with grooves in which the photographs to be copied are placed. There are also included a dark slide and C.D.V. and cabinet masks to place in front of the photograph for obtaining the "stamp" effect.

FALLOWFIELD'S MOTTO MOUNTS FOR CHRISTMAS AND THE NEW YEAR.

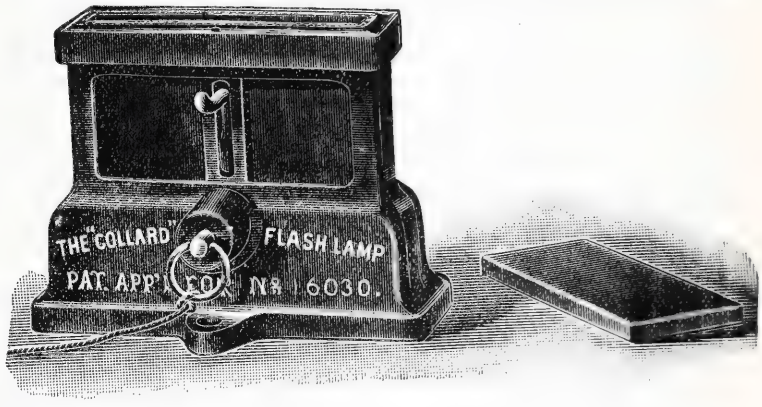
Jonathan Fallowfield, 146, Charing Cross-road, London, W.

A SPECIAL 24-page list, issued by Mr. Fallowfield, contains over fifty illustrations of the designs selected for his Christmas and New Year motto mounts. The following offer is made to dealers and professional photographers:—"To enable dealers and professional photographers to show to their customers a good variety of designs to select from, without keeping a very large stock, Mr. Fallowfield will, on receipt of trade card and a postal order for 5s., send, post free, to any address in the United Kingdom a specially selected parcel of sample Christmas mounts, of full value (at list prices) for 7s. 6d." About two dozen samples of these mounts have been submitted to us. They range in size from "postage stamp" to cabinet, and in tone, design, and lettering are all marked by refinement and good taste. We can cordially recommend these mounts to the attention of our readers.

THE COLLARD MAGNESIUM FLASH LAMP.

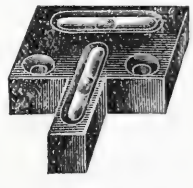
Manufactured and sold by the Collard Flash Lamp Co., Slough, Bucks.

SOME excellent interior, group, portrait, and exterior photographs taken by the aid of this lamp have been shown to us, and from an examination of the instrument itself we have been struck by its simplicity of working. The instructions for the use of the lamp are as follows:—(1) Fill the wick chambers of the lamp with methylated spirit, being careful to use only sufficient spirit as is necessary to completely saturate the wick; (2) place the charge of powder in the central trough or tray, the powder to be spread evenly over the surface of the tray bed; (3) then set the lamp by pushing down the levers at each side the lamp until the releasing trigger engages; (4) apply a light to each wick and see that the flames from each side the lamp meet in the



centre over the tray chamber. The lamp being now ready for use, the flash is made by a pull of the cord attached to the releasing trigger. As soon as the lamp has been flashed, place the metal cap in position, which will extinguish the flaming wicks. Measuring 4½ inches across, and well made throughout of metal, the Collard lamp appears to be well adapted for flashlight work of various kinds. After ignition of the wicks, the powder is instantaneously projected through the flame. The result is a large flash, by which the photographs shown to us were secured at a lens aperture of f-16.

A SPIRIT-LEVEL is an indispensable adjunct to work with the camera, and the little illustration here shows the article in one of its most



useful forms, "the two-tube," which enables the camera to be levelled with very great accuracy. It is obtainable of Mr. Arthur Rayment, Wholesale Optician, 125, Earlham-grove, Forest Gate, London, E.

FROM the Vanguard Manufacturing Company, of Maidenhead, whose photographic specialities enjoy wide and well-deserved appreciation, we recently received for trial a bottle of combined toning and fixing bath, guaranteed to contain the full quantity of gold. We used the bath for toning and fixing matt and glossy gelatino-chloride prints, and obtained results colorifically satisfactory. This combined bath will, no doubt, be appreciated by amateur workers, whose requirements the managing director of the Vanguard Company, Mr. W. Ethelbert Henry, is so well qualified to gauge.

"ORTHOCHROMATIC and Three-colour Photography Simplified" is the title of a pamphlet by Messrs. James Cadett and E. Sanger Shepherd, which has recently been published by Messrs. Cadett and Neall, of Ashtead. It may be obtained gratis on application. The first part deals with orthochromatics, and the second with the system of colour-photography associated with the name of Mr. Sanger Shepherd. The

object of the pamphlet, according to the preface, is to create interest amongst photographers in subjects which, comparatively speaking, are perhaps new to them, and to pave the way to a deeper study of these interesting and beautiful branches of photography. Mr. Cadett and Mr. Shepherd are recognised authorities on orthochromatism and colour, and the little work before us should be instrumental in spreading a knowledge of both subjects.

News and Notes.

THEIR Majesties the King and Queen and the Royal Family have honoured Mr. Wilkinson, photographer, of Norwich, with a sitting for their photographs.—"Court Circular," November 9.

MESSRS. Fuerst Brothers, of 17, Philpot-lane, E.C., send us their November Photographic Price List (wholesale). They will be pleased to send a copy of same to any one interested on receipt of trade card.

ROYAL Photographic Society.—The first lantern meeting of the session will take place on Tuesday, November 19, at 8 p.m., at 66, Russell-square, when Mr. J. W. Groves, F.L.S., F.R.M.S., will give a lecture, entitled, "Japan, as illustrated by herself."

WE are asked to state that, in connection with the Campbell-street Church Bazaar, Nottingham, a photographic exhibition will be held. There will be two classes and four prizes. Entries close on December 20, and forms may be obtained of the Hon. Sec., Mr. G. Colville James, 12, Beacon-hill, Nottingham.

ROTHERHAM Photographic Society.—The following were the lantern slide awards in connection with the recent exhibition of this Society:—Class C (open), Silver Medal, James Smith, Liverpool; Bronze Medal, Percy Hancock, Manchester. Class E (members'), Silver Medal, A. S. Lyth; Bronze Medal, H. C. Hemmingway.

LIVERPOOL Amateur Photographic Association.—At the last weekly meeting, Mr. Fred Anyon gave a demonstration of the carbon process. A special feature of the demonstration was the development of a piece of tissue which was sensitised over three months ago and stored in a new pattern of storage box. The print developed up without showing any degradation of half tones, and was quite equal to that produced from a piece of freshly-sensitised tissue.

MR. Matthew Whiting, of Aucklands, No. 48, North-side, Wandsworth-common, formerly a well-known amateur photographer, whose estate has been valued at £153,804 8s. gross, including personalty of the net value of £140,870 18s. 7d., left by his will of December 16, 1895, with codicils of May 5, 1896, and December 22, 1897, the residue of his property (about £120,000) in trust in equal shares for St. Thomas's Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the Westminster Hospital, the Middlesex Hospital, the London Hospital, the Royal Free Hospital, St. Mary's Hospital, the Great Northern Hospital, the Brompton Hospital for Consumption and Diseases of the Chest, and the New Hospital for Women, Euston-road.

THE following is a list of those who have been recommended by the President and Council of the Royal Society for election into the Council for the year 1902, at the anniversary meeting on November 30:—President, Sir William Huggins; Treasurer, Mr. Alfred Bray Kempe; Secretaries, Sir Michael Foster, M.P., and Dr. Joseph Larmor, D.Sc.; Foreign Secretary, Dr. Thomas Edward Thorpe, C.B., Sc.D.; other members of the Council, Professor Henry Edward Armstrong, Mr. William Bateson, Dr. William Thomas Blanford, Professor Frederick Orpen Bower, Sc.D., Mr. Charles Vernon Boys, Professor William Burnside, Professor William Watson Cheyne, C.B., Professor George Carey Foster, Professor William Mitchinson Hicks, Mr. Frank McClean, Professor Henry Alexander Miers, Sir John Murray, Professor J. Emerson Reynolds, Sc.D., Dr. Robert Henry Scott, Sc.D., Professor Charles Scott Sherrington, M.D., and Mr. Joseph Wilson Swan.

THE Invitation Card to the Guildhall Banquet.—The card of invitation to the Lord Mayor and Sheriffs' Banquet at the Guildhall, on November 9, 1901, consists of a reproduction of a beautiful allegorical engraving, dated April, 1790, by F. W. Tomkins, pupil of Francesco Bartolozzi, R.A., after William Hamilton, R.A. The City of London, represented as a fair woman, holds in her hand a sword of state and charter, and is supported on one side by the infant Mercury, typifying Commerce, and on the other by a personification of Liberality. She escorts a triumphal car, decorated yith figures of Neptune and mermaids, on which is seated Britannia, represented as the Goddess of Liberty. The car is drawn by four horses, driven by the Goddess of Health, and over it hover figures of Peace and Plenty. By its side walks the British lion, ready to meet its enemies. At the head of the card are depicted the arms of the Lord Mayor, Sir Joseph C. Dimsdale, Kt., M.P., those of the Sheriffs, Mr. John Charles Bell and Mr. Horace Brooks Marshall, M.A., J.P., appearing below on either side of the border. The wording of the invitation appears at the foot of the design. Messrs. Blades, East and Blades, 23, Abchurch-lane, London, E.C., fine art printers, are responsible for the production of this work.

THE criticisms of the public at picture exhibitions are sometimes amusing, and occasionally instructive. The other day, at the International, a tall, severe-looking man, with his arms held behind his back, "did" the show, accompanied by his wife, a tiny lady, catalogue in hand. "But," she said, "the pictures are so dull." "Yes," answered her spouse, in Jingle-like phrase; "mud, mud, mud on every palette." "Ah, just look there," ejaculated the lady, "these colours are bright enough." "Colours impossible," retorted the husband; "never seen in Paris, not even on the Terrace at Monte Carlo. Flesh like mustard and emerald green. Bah, diseased." Further on the couple stopped in front of a portrait by one of the lights of Glasgow. "Hum," he burst out, "hands better than face, shawl better than either. Looks as if she had lived all her life on dry toast and tea to sustain a blackguard son. Scotch lady? Hum! thought so." These criticisms were given after the most cursory glance at the pictures, yet there was a grain of truth in them. The R. B. A. show, being more conventional, afforded less opportunity for adverse remarks. One lady, regarding a seascape, said: "My! and the chap who did that calls himself an artist, I suppose. Well, I've been to Margate and Herne Bay, and I never saw sand like that." An old gentleman, with gold-rimmed spectacles, stared some time at a picture of Pont Neuf, Paris, and, turning to his companion, remarked: "It does not seem to have been vaccinated," and the spotty, Monet-like style of the painting justified the criticism.—"Morning Post."

Commercial & Legal Intelligence.

MESSRS. O. Sichel and Co., 52, Bunhill-row. E.C., send us a copy of their eight-page sale list, and ask us to inform our readers that a copy will be sent gratis on receipt of a card.

FIRE at a Concert Hall.—The fire brigade was called to a Brighton concert hall on Saturday afternoon, where Poole's Myriorama has been on view. It was found that a film in a cinematograph had caught alight, but it quickly burned itself out. Some alarm was caused among the children in the audience, and a boy had to be taken to the hospital suffering from fright.

MANGOLD Photo Works, Limited.—The above-named company has been registered by F. E. Buckland, of 15, Springfield-road, Tottenham, N., with a capital of £2,000 in £1 shares. The objects for which the company is formed are, to acquire the patents, trade-marks, and models of S. L. Goldman, of 42, Goswell-road, E.C., including Patents No. 13,576, of July 3, 1901, and No. 20,932, of October 18, 1901, and to carry on the business of manufacturers of photographic and scientific apparatus, etc. No initial public issue. Registered without articles of association. Registered office, Bowling-green-walk, Pitfield-street, Hoxton.

MR. J. Lizars, of Glasgow, writes:—"I have had manufactured at my factory, Golden-acre Works, Craignestock-street, Glasgow, for His Majesty's Government, a large photographic camera for use at the Ordnance Survey Department, at Southampton. The camera is one of the largest, if not the largest, that has ever been manufactured in Britain, and there have been used, in the construction of the instrument and three slides, 450 square feet of Spanish mahogany, varying in thickness from ⅜ in. to 2¼ in., and valued at over £35 in its raw state. In the construction there were used 106 brass bindings, weighing nearly half a hundredweight of metal, and 1,560 screw nails, the total weight of the camera and three slides, including the focussing screen, being over one ton. This will give one a fair idea of the size of the article. I may mention that the apparatus has been despatched to Southampton by rail in a special covered van."

ALLEGED Extensive Frauds.—George Hypolite Le Bluff, 32, greenhouse-maker, of 147, Ladywell-road, Lewisham, was charged on remand with obtaining, on August 13, £1 2s. 9d. by false pretences from Stanley Page Hutton, engineer, of Sundridge, Sevenoaks. The case against prisoner was that he had received a cheque for the amount in question from Mr. Hutton, who had since been unable to obtain from prisoner the greenhouse he had ordered, or the return of his money. John Henry Khoeler, cycle maker, of Elgin-road, Croydon, stated that in August he saw an advertisement in a paper offering "soiled but good greenhouses" for sale, and giving the name of Mitchell, Straightsmouth Portable Building Co. He communicated with the firm, and ordered a portable building, for which he sent a cheque for £2 5s. He wrote several times complaining about delay, but he never received the building. Other similar evidence having been given, accused was remanded.—"People," November 10.

PHOTOGRAPHERS and their Sitters.—An Interesting Decision.—Some time ago an action was raised at the instance of Mr. Thomas M'Cosh, writer, 196, St. Vincent-street, for his own interest, and also as tutor and administrator of his pupil daughters, against Messrs. G. Crow and Co., photographers and art publishers, Queen's Studio, 136, Buchanan-street, Glasgow, to interdict Messrs. Crow from printing, publishing, exposing for sale, or exhibiting in their studio in Buchanan-street, or on the walls of the stair or passages leading thereto, or elsewhere, photographs of the pursuer's children. The case was brought before Sheriff-Substitute Strachan, who has issued an interlocutor disposing of the case in favour of the defenders. In the course of a note to his interlocutor, the Sheriff states:—"I can see nothing to prevent a photographer enlarging a photo, and hanging it on the wall of his studio,

either for his own gratification, or to show what he can do in the way of enlargement. There is nothing in that in the slightest degree calculated to shock or injure the feelings of even the most sensitive of mortals. In this case there was neither breach of contract or confidence. But, further, in this case, the subject or the photos were mere children at the time they were taken, and this interdict against the exhibition of the enlargements is only applied for after a lapse of nine years, when the features of the children must necessarily be entirely changed, and could only be recognised by the pursuer himself, or members of his family. It is difficult to see what conceivable interest the pursuer can have in now asking to have the enlargements taken down from the studio and destroyed."—"Aberdeen Evening Gazette."

Potassium Cyanide.—A Chemist Censured.—An inquest was held at Kettering, on Thursday, October 24, concerning the death of Emma Heighton (51), wife of Walter Heighton, engineer, of Kettering. The evidence showed that during her husband's absence, on Wednesday, October 23, deceased had taken poison, and was found dead when he returned, a cup, containing some white substance, said to be potassium cyanide, being found on a shelf in the kitchen. Mr. Heighton stated that his wife had suffered mentally for about three years. He did not use potassium cyanide in his business, and he thought it was a shame that chemists should be allowed to sell such poisons. Edwin Thorp, pharmaceutical chemist, High-street, Kettering, stated that on October 22 Mrs. Heighton came to his shop and asked if he kept potassium cyanide. He answered in the affirmative, but said that he could not serve her with it. She then said that her husband was out, and that he had sent her for some for electro-plating. He told her that her husband had better come for it. She went away, but shortly afterwards came again, and asked that she might have some, as her husband was out all day, and he wanted to get on with the work that night. He then supplied her with sixpennyworth—about an ounce—which he put in a box, labelling it "poison." He knew the woman, and also that her husband was an engineer. The next day, October 23, she came again for more, as what was supplied the previous day was not quite enough. He inquired if her husband had a proper place to put it, and she said, "Oh, yes, and he knows how to use it." She then had another ounce of potassium cyanide, which was also put in a box labelled "Poison." Mr. Thorp produced his poison book, and said that Mrs. Heighton signed for the first lot purchased, but not for the second lot. The Coroner: Why not? Mr. Thorp: I hardly considered it necessary. The Coroner: Do the regulations of the Pharmaceutical Society say if you sign one day you need not sign the next? Mr. Thorp: I think that is left to the discretion of the chemist. The Coroner pointed out that the chemist was required to register the date, name of poison, and purchaser; what the sale was for, and that the purchaser should sign for it. Moreover, that if the purchaser was not known to the chemist, that person must be introduced by some one who was known to him. There was no discretion in the matter, and, if the chemist did not observe the law, he ran the risk of a heavy penalty. Mr. Thorp was then questioned by the Coroner and Mr. Heighton as to whether he knew deceased, and he admitted that on the occasion of the first sale he did not know the woman, except by having seen her in the street. The Coroner then pointed out that in the poison book produced by Mr. Thorp there was a large bracket connecting the name of the deceased signed on the occasion of the first purchase, and a blank space left when the second purchase was made and he asked what was the reason for it. Mr. Thorp admitted that he altered the book subsequent to the purchase. The Coroner: When? Mr. Thorp: Just before coming here. The Coroner: Is that not running in the face of the law? Police evidence having been given, the Coroner said that Mr. Heighton had some ground for complaining of a certain amount of carelessness in the selling of a deadly poison. If Mr. Thorp had kept to his first intention not to sell any poison to the woman, he would have been all right. If he had stuck to the law, which had been enacted to prevent reckless dealing in poisons, and had insisted on some personal friend accompanying the woman, it was possible that she would not have been allowed to go to the chemist's again, and those selling poisons might have been warned against serving her. He did not say that the deceased would not have committed suicide, but not by means of poison. The case only showed the necessity of persons who dealt in poisons doing so according to law in all details. The law was not always so foolish as it was said to be, and in the case of poisons there was much common sense and reasonableness in the regulations which had been drawn up by chemists and druggists themselves, and sanctioned by Parliament, and therefore ought to be obeyed. He certainly thought that in the present case there had been carelessness on the part of Mr. Thorp. The Jury, after deliberating in private, returned a verdict of "Suicide whilst temporarily insane, and added the following rider: "We, the Jury in this case, consider that the chemist, Edwin Thorp, was guilty of great neglect in selling cyanide of potassium to the deceased. In our opinion, he did not know her either by sight or by name, and we think his conduct, under the circumstances, deserving of censure."

"A Misleading Statement."—During the lifetime of the Rev. Hannibal Goodwin, various absurd stories were circulated concerning his alleged connection with film photography. We have never taken any notice of these stories, owing to their obvious sensationalism, although they always dragged in the name of this Company in a way that implied or directly charged that we were using, without authority, a process belonging to Goodwin. However, the affair having been brought up anew by the recent publication of a statement (fathered by the persons who, it appears, have recently acquired an interest in the Goodwin patent for the evident purpose of making a strike by trying to unload it on us), we think it perhaps worth while to use a little space in this circular in giving our customers some of the rock bottom facts in regard to this patent of straw. The following is the misleading statement, referring to Patent No. 610,861, dated September 13, 1898, granted to the Rev. Hannibal Goodwin of Newark:—"* * * consequently it is a foundation patent in the film business, and owing to the scope of its claims, it is believed to occupy a controlling position in regard to other patents. Owing to various interference proceedings in the Patent Office, the issuance of the patent was delayed, but they give it the advantage of having been practically litigated in the office before it was issued. The Eastman Company filed two applications—one through H. M. Reichenbach, the other by Mr. Eastman—and endeavoured to obtain the patent. The result of the interference proceedings was, that the Eastman Company were obliged to acquiesce in the decision awarding priority to Mr. Goodwin, a subsidiary patent only being granted to his opponents. Then followed a long series of proceedings against the issuance of the Goodwin patent; they lasted a long time, and included an exhaustive examination of the entire prior art for references against it. The result, however, was the allowance of the patent to Mr. Goodwin." The facts of the matter are that Goodwin, after he had learned of our success in perfecting a process for the manufacture of rollable transparent films, and after we had sucessfully marketed such films, raked up an old application which he had sleeping in the Patent Office, copied into it a lot of matter he obtained from us, and then tried to raise an issue in an interference proceeding with the Reichenbach application. After a hot fight we made him show up what he had in his original application, and obtained a decision from the Commissioner of Patents which put on him the burden of proving that he had first made the invention. This decision was as follows: "It is found that Goodwin did not claim the improvement in controversy nor make a statement of invention equivalent thereto until after the same was claimed by Reichenbach, wherefore the burden of proof is on Goodwin." Goodwin did not attempt to support this burden, obviously because he could not, and decision of priority was made in favour of our assignor. Afterwards Goodwin disclaimed our process under his oath. The other application referred to, the one by Eastman, was for a machine for making the film, and it was granted without controversy. There is nothing on record so far as we know to indicate that Goodwin ever got as far as the mechanical side of the problem. The Eastman machine was the first successful one for making transparent support in long lengths. It is still in use, and has probably made 90 per cent. of all the rollable transparent film used by the public up to the present time. It will thus be seen that the Goodwin patent was litigated in the Patent Office, but clearly in our favour. We do not think Goodwin ever had any workable process for making a transparent film. If he had, we never heard of his using it or any one else making any use of it. Certainly we have never used any process except the one he disclaimed under oath. It is self-evident, therefore, that the statement that Goodwin won against us in the Patent Office, and that he obtained a controlling patent for making a transparent film, is absolutely false. The owners of the Goodwin patent have not even the proverbial "half a truth" on which to base their claims. We consider their absurd statements beneath notice, and should pay no attention to them, except that continued silence on our part, and continued reiteration of garbled facts on theirs, might, in time, lead the trade to a misunderstanding of the facts as they exist.—"Kodak Trade Circular."

Patent News.

The following applications for Patents were made between October 28 and November 2, 1901:—

Printing Frames.—No. 21,855. "Improvements in Photographic Printing Frames." Paul Kindermann.

Developing Cinematographic Films.—No. 21,873. "Improvements in the Method of and Apparatus for Developing, Fixing, and Toning Cinematographic and other Photograph Films." (Communicated by W. Elsner and Paul Latta, Germany.) Complete specification. Herbert John Haddan.

Print Cutter.—No. 21,937 "Photographic Print Cutter, circular." Frank George Cundy.

Plates and Papers.—No. 22,040. "Improvements in the Manufacture of Photographic Plates and Papers." Complete specification. Otto Buss.

Cinematographic Apparatus.—No. 22,042. "Improvements in or relating to Cinematographic Apparatus." George Frederic Hatton.

Photographic Apparatus.—No. 22,108. "Improvements in Photographic Apparatus." Charles Edmund Peczenik.

FORTHCOMING EXHIBITIONS.

1901.

November 23–30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.

December 3–7 ..... Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.

Dec. 20–Mar. 1902 ...	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.
1902.	
„ 24–Jan. 4, 1902	Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.
February 19–26	Croydon Camera Club, The Art Galleries, Parklane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
18.....	Camera Club	Demonstration: *Austin Edward's Films and Warwick Plates.* W. D. Welford.
18.....	Croydon Microscopical	Mr. Rudler's Seventh University Extension Lecture.
18.....	Oxford Camera Club	Exhibition of Members' Lantern Slides.
19.....	Birmingham Photo. Society ...	*Oxygen and Compressed Gases.* A. E. Knowles.
19.....	Stonehouse	Open Night.
19.....	Thornton Heath	Demonstration: *Enlarged Negatives.* W. C. H. Anson.
20.....	Borough Polytechnic	Lantern Night. Monthly Slide Competition.
20.....	Croydon Camera Club	Demonstration: *The Carton Printing Process.* W. H. Rogers and L. G. Kough.
20.....	Photographic Club	Open Night.
20.....	Southsea	*With Camera and Ice Axe in the Canadian Rockies.* L. J. Steele.
21.....	Ashton-under-Lyne	Discussion on Photographic Prints by Members.
21.....	Brentford	*Lantern Slide Making.* J. A. Hodges, F.R.P.S.
21.....	Camera Club	*Pictures on the White Nile.* E. N. Buxton.
21.....	Darwen	*Lantern Slide Toning for Beginners.* J. W. Smith.
21.....	Liverpool Amateur	Hot-pot Supper.
21.....	London and Provincial	Lantern Night: *Wells and District.* J. W. Hodges.
21.....	North-west London	*On the Peninsular Coast with a Hand Camera.* R. Child Bayley, F.R.P.S.
21.....	Richmond	*Practical Demonstration of the Watkins' System of Development.* Mr. Emery.
21.....	Rodley, Farsley, and District..	Lantern Lecture: *Yorkshire Dales.* G. Bingley.
22.....	Borough Polytechnic	Instruction Evening: *Developers—their Use and Abuse.* F. W. Bannister.
22.....	Croydon Microscopical	Lantern Slides for *Soirée.*
22.....	Plymouth	*Architectural Photography, Pictorially Treated.* H. W. Bennett, F.R.P.S.
22.....	Sutton	Lecture: *Negative Making.*
22.....	West London	Demonstration: *Gas-light Development Papers.* L. Selby.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 7,—Mr. W. Thomas in the chair.

Mr. P. Everitt said that the suggestion made at a previous meeting that a bath of alum and nitric acid would probably remove certain wavy marks upon some plates he showed, had been found of no value. Further discussion that ensued drew attention to the electrical action that an ebonite shutter to the plate holder was known to have had upon plates. Mr. Everitt pointed out that the ebonite shutter of the magazine he used was quite half an inch from the plate.

Mr. J. S. Teape replied that he had many times seen flashes from ebonite shutters in the dark room when opening or shutting them, and he submitted that the same may have occurred with the plates shown by the last speaker.

Mr. R. P. Drage replied to some criticism of leather changing bags, and their light-proof qualities, saying that he had never found them wanting. He had one in use for seven or eight years, and could speak from experience. He did not think the electrical theory advanced was admissible, because of the distance of the film from the ebonite shutter, not to mention the fact that this magazine shutter was, as a rule, entirely drawn aside while the batch of exposures was made.

Mr. Everitt was inclined to accept the opinion that the plates themselves were faulty.

Mr. R. J. Kindon passed round some samples of the toning and fixing salt brought out by the Actien Gesellschaft fur Anilin Fabrikation, and asked the members to try the preparation. It was a neutral salt, and always remained in that condition. It exercised no reduction upon the prints, and there was no sulphur toning or double toning possible, which he submitted as three great advantages, besides incidental ones that need not be mentioned. The question of the permanence of results by combined toning and fixing methods was one that had been prominently brought forward by Mr. Drage on several occasions.

Mr. R. P. Drage said that the introduction of this salt was a move in the right direction. He had referred to the apparent reluctance on the part of chemists to investigate the matter, and he was glad to know that he might have to reconsider this opinion before long.

Mr. S. H. Fry admitted that a large number of prints by the combined method might be described as lacking in permanence; but, so had prints by the separate method. It was no argument to say that the combined bath was not to be recommended because of instances of want of permanence, seeing that the same thing could be argued against separate toning and fixing. It could be clearly shown that the separate bath was as capable of producing results that were not permanent as any combined method. The whole thing rested upon a proper understanding of the process, and, from what he had heard from others, he did not believe that the combined method was so undeserving or unreliable as many imagined.

The Chairman believed that much of the want of permanence in combined toned and fixed prints was due to the fact that the chief users of the methods—amateurs—rarely carried the toning to the purple stage, but removed the print after but a few minutes' treatment. Only a partial fixing has taken place, and stains and fading are the natural outcome. If the prints were thoroughly fixed after a short treatment like that, he saw no reason to make a comparison between prints by the two methods.

Mr. Kindon said that with the salt in question toning did not commence for seven or more minutes, when fixing had already advanced considerably. The toning also proceeded very slowly, and thus there was no risk of imperfect fixing.

PHOTOGRAPHIC CLUB.

October 30,—Mr. Thomas Bedding in the chair.

Mr. F. A. Bridge, the Hon. Secretary of the Photographic Convention of the United Kingdom, gave an illustrated lecture upon this year's

Oxford Convention.

He disclaimed any idea of lecturing upon Oxford itself, but intended to show a collection of lantern views by members of the Convention who were present at Oxford, with such brief explanations as the case required. In the first place, he found that many people talked about the Convention without really knowing its history, aims, and growth. He had brought up an enlargement of the first Convention group, taken at Derby in 1886. The Convention came into existence as the result of a casual conversation at a street corner between two men, Traill Taylor and J. J. Brigginshaw, the result being a gathering, 46 strong, for three days. They were hard at work every and all day on excursions, and in the evenings patiently listened to three or four papers. Since that meeting the Convention had steadily grown, meeting at Glasgow, London, Plymouth, Leeds, Chester, Birmingham, Bath, Edinburgh, Yarmouth, Dublin, Shrewsbury, Newcastle, Gloucester, and Oxford; and at Oxford there was the excellent attendance of 340 members. Out of such small beginnings grew the Convention of the present day, an institution that was known throughout the photographic world, and one that at its last meeting partook of an international character, by the presence of several members of the "Union Internationale" of the Continent. Mr. Bridge then proceeded to comment upon the pictures, which were the work of Mrs. Snowden Ward, Mrs. Alfred Ellis, Godfrey Bingley, Harold Baker, F. York, Mr. Woodward, F. W. Hindley, C. B. Howdill, and others. The photographs illustrated the several excursions that were made by road and river, visiting Abingdon, Iffley, Warwick, Kenilworth, Banbury, and many other places of interest. In Oxford itself, the colleges and the college gardens were very thoroughly photographed, and the general quality of the work was such that the Chairman ventured to say that no finer results had been shown by any Convention meeting, and that what the meeting had seen conclusively proved that the Convention's object—the advancement of practical photography—was being very forcibly brought home.

A hearty vote of thanks to Mr. Bridge and the ladies and gentlemen who contributed slides, was carried by acclamation.

Croydon Camera Club.—Messrs. Lionel G. Kough and W. H. Rogers, on Wednesday, 6th inst., demonstrated the procedures necessary to make 15 by 12 enlarged negatives from quarter plates. Mr. Kough, using the club lantern, screen, etc., made several enlarged negatives upon glass, exposure being from four to six seconds, developer Ortol, results satisfactory. Thomas' ordinary plates were used; a transparency positive quarter-plate size being first made by contact, and its enlarged image projected on to a 15 by 12 plate. Mr. W. H. Rogers followed by showing the methods adopted by him for producing paper negatives. He claimed for these that they are much cheaper, are non-breakable, and are more compact than are glass plates. They are also easier to "work up." Mr. Rogers, using Ilford slow bromide, which kind of paper he preferred to all others he had tried, because of its unusual latitude, proceeded to make several enlarged negatives from quarter-plate transparencies; developers used, metol for the first one and rodinal for the rest. There was a crowded attendance. Mr. Batty stated that a more modern lens should be fitted to the club lantern. Messrs. Kough and Rogers, however, expressed themselves perfectly satisfied with the lens already fitted. Mr. W. H. Smith showed some interesting attempts to obtain cinematograph films by means of a series of his oxy-magnesium lamps, using the pocket chrono.

Nottingham Mechanics' Institute Camera Club.—The third meeting of the session was held on October 29. A large audience assembled to hear the experience of eight young gentlemen who spent their summer holiday in Switzerland. Four of the party carried cameras, and, from

the large number of exposures made, the best had been selected, and from these one of the four (Mr. W. A. Woodsend) had produced a very fine series of lantern slides. The lecture, entitled "Four Cameras in Switzerland," was given by Mr. Ernest G. Leighton, and the repeated rounds of applause attested the high-class character of the slides, as well as the appreciation of the very interesting description given by Mr. Leighton. Mr. T. Wright presided.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

AN INTERESTING STEREOSCOPIC PRINT.

To the EDITORS.

GENTLEMEN,—I enclose you a stereoscopic print which may interest you. It is that of a flash produced by the Todd-Forret magnesium flash-lamp. I did not use lenses, only two pin-holes to get the result, as the lenses would have given me a hopelessly fogged plate. I arranged matters as regards size and position with my lenses in the ordinary way, and then dispensed with them, using a metal plate with two pin-holes instead. I then flashed the lamp, a result of which I now hand you.—I am, yours, &c.,

A. H. BAIRD.

Edinburgh, November 9, 1901.

PROFESSIONAL PHOTOGRAPHERS AND DEALERS' DISCOUNTS.

To the EDITORS.

GENTLEMEN,—I have read with much interest a correspondent's article on dealers' discounts and professional photographers. Photographers are not only consumers, but also producers, and therefore feel quite entitled to retail dealers' discounts, as is the custom in other trades, where a producing tradesman is dependent on a manufactured article for the carrying on of his trade. It is well-known that a number of photographers manage to get dealers' discounts in a round-about way, which is distasteful to the majority, who have to stoop to unprincipled practices to gain that end. No, before I can be convinced that a photographer should not have his discounts raised to the level of a retailer I should like a correspondent's answer to the following questions—

Does the plate-maker pay 15 per cent. more for his gelatine, etc., than the retailer?

Does the paper-maker pay 15 per cent. more for his unsensitised papers than the retailer?

Does the camera-maker pay 15 per cent. more for his brass-fittings than the retailer?

Does the painter pay 15 per cent. more for his paint than the smallware dealer.

Does the joiner pay 15 per cent. more for his nails than the smallware dealer?

Does the boot-maker pay 15 per cent. more for his soles than the smallware dealer?

Does the printer pay 15 per cent. more for his paper than the stationer?

Does the box-maker pay 15 per cent. more for his card-box than the stationer?

Does the dyer pay 15 per cent. more for his dye than the chemist?

Does the laundryman pay 15 per cent. more for his soap, etc., than the chemist?

Does the brewer pay 15 per cent. more for his hops than the chemist?

Does the tailor pay 15 per cent. more for cotton reels, buttons, etc., than the draper?

Does the milliner pay 15 per cent. more for ribbons than the draper?

Does the cigarette-maker pay 15 per cent. more for tobacco than the tobacconist?

Does the baker pay 15 per cent. more for flour than the grocer?

Does the iron-maker pay 15 per cent. more for coke than the coal dealer?

Does the carriage-builder pay 15 per cent. more for iron fittings than the ironmonger?

and so on, where the tradesman must use manufactured articles for the purpose of his trade, which articles are also offered for sale by the different dealers.

I have every confidence that the P.P.A. will ultimately better the present relation between the photographer, manufacturer, and wholesale dealer. Professional readers, don't wait till this or the other matters are righted, but join the P.P.A., attend the meetings, and voice your views. I rejoice to see the roll of membership growing apace, so will it in strength, and enable to place the photographer in the same position as any other producing tradesman.—I am, yours, &c.,

ONE OF THE FIRST HUNDRED M.P.P.A.

November 11, 1901.

To the EDITORS.

GENTLEMEN,—In an article on dealers' discounts, etc., in your issue of Nov. 8th there is a statement of the argument from the plate-makers' and dealers' point of view. It is by no means a complete statement of the case, and I appeal to you to allow me to add to it.

No one will deny that the distributors of any article who keep stock, and make it known, are entitled to expect some return; and so too is the man who takes and forwards orders for an article which he presumably recommends, but naturally it is not in the second case as much as if he had stock on hand at his own risks. But the important point is, Who is to pay this charge? and how is the amount to be assessed? Now, it seems to me that those who benefit should pay: the manufacturer will pay in proportion to the orders—which he might otherwise not have got—the consumer for the conveniences offered to him. Moreover, where the dealer consults the convenience of the manufacturer he may reasonably expect more consideration from him; he does this by larger orders, especially when they are steady orders for a regular periodic supply, and by paying regularly without unnecessary delay or correspondence. Just in the same way he charges his customers; if he has to send travellers for orders or to lie out of his money by taking bills, or giving credit without them to such people, he should charge more than to those who call, pay cash, and carry away their purchases; but these are matters to be settled between him (the dealer) and his customers; the manufacturer has no real knowledge of the cases, and his interference is as likely, at least, to do harm as good.

Even the man who merely takes orders and transmits them has a claim on the purchasers, as he saves them trouble and correspondence, and on the manufacturers for whom he acts as agent and advocate, even if he does not receive their money and transmit it, or guarantee payments.

Of course, the small dealer cannot sell to the user at the same price as the large one if he expects to live in the same style. If the allowance he can earn from the manufacturer, added to what his customers are willing to pay for the facilities he offers, will not suffice him, then he must cease to exist or seek another mode of living.

What the plate-makers try to do is to bolster up the small dealer—1st, by laying down a price at which all dealers shall sell their goods; 2nd, by taking on themselves the charges which would naturally be paid by the customers or users, and distributing them unfairly so as to favour the small dealer. The retail price is thus so fixed that it is above that at which large dealers could sell. They, of course, do not growl, for they make a large profit, which they can say is involuntary; but their customers have a grievance, and professionals complain that they are not fairly treated—nor are they.

What does it matter to a maker what is done with his plates after he is paid for them? If they are wilfully broken, destroyed by fire, or sunk in the sea, after they have passed into the hands of his (the maker's) customers, would he acknowledge any responsibility? Naturally he would not; it would matter nothing to him. What more can it be his concern whether his customer gives the plates he has purchased away, sells them at his own price, or uses them himself? Some of his customers, the dealers, or professionals offer him terms which save him trouble and consequent expense; to these he will naturally give encouragement by special terms, free carriage, discount, etc. That is fair, and no one would complain. But the case is different when the advantages depend, not on the amount of business done, but on the use made of the articles by the purchaser. Not only is this procedure unjust as between man and man (is not one man's money as good as another's?), but the data for settlement, and the evidence that it has been observed, can only be obtained by an inquisitorial inquiry which, judging from your columns, often fails to attain its object. That the Plate-makers' Union should be judges, and practically without appeal, in their own cause is manifestly unfair; it is tolerated—as so many wrongs are in England—because obtaining redress entails so much trouble and expense on an individual: the wrongdoer thrives because there is no co-operation to restrain him.

Now the P.P.A. appear to intend tackling the evil, and I hope they will do it on broad lines of principle, such as I have laid down. They have nothing to fear from that bugbear, the amateur, who would always willingly have his wants supplied near at hand if he could rely on fair dealing. Some few, of course, who for one purpose or another use large quantities of materials might claim, and be accorded, wholesale terms by the makers, but they would be few indeed. It would be interesting to be informed whether there are not now favoured individuals who, on one plea or another, get far more favourable terms than retail prices. I believe there are; I am sure there ought to be!

In this I have said nothing about whether the professional should have his discount raised or the dealers' lowered. I have endeavoured to show how matters would adjust themselves equitably; how the whole question of dealers, professionals, and amateurs would vanish for good. Of course, some would be displeased, some would suffer who deserve consideration, but no proposal could avoid some hardship on individuals. At present many are unjustly treated to favour those in false positions. I am an amateur: it is very doubtful if I should gain anything by the change I propose, certainly the gain would be quite insignificant.—I am, yours, &c., J. F. T.

To the EDITORS.

GENTLEMEN,—I notice in your issue of November 8 that "A Correspondent" states "some 330 professional photographers are already recognised as dealers by the Association, and receive dealers' discounts." It would be interesting to some of us to learn who the 330 are, and what this dealers' discount is.—I am, yours, &c.,

68, East-street, Brighton, November 9, 1901. A. H. FRY.

THE PHOTOGRAPHY OF MOVING WHEELS.

To the EDITORS.

GENTLEMEN,—With your permission I will endeavour, in simple language, to make this matter clear to "J. M."

A wheel attached to a moving vehicle has two motions, the revolving motion round the axle and the onward motion. These motions are quite independent of each other, and, if the camera be moved horizontally at the same speed as the vehicle, so as to remain exactly opposite the centre of the axle, the onward motion of the wheel, in relation to the camera, is entirely done away with, the revolving motion only remaining, and that motion must clearly be the same as that of a flywheel, the top and bottom spokes for the time being moving at the same speed, though in opposite directions as regards the axle and the camera.

"Y" is correct in saying that in the case of a motor-car the fulcrum is the ground, but that has nothing to do with the matter in question, a driving-wheel revolving—if it does not skid—exactly the same as any other wheel.

I have assumed, of course, that both vehicles are moving on a perfectly level surface, and without vibration of any sort.

Now, as to photographing a vehicle passing across the front of a stationary camera. Supposing the wheel to have a circumference of nine feet, and to pass over nine feet of ground in one second, then the axle will have moved nine feet horizontally in that second, and the wheel will have made one complete revolution; consequently that part of the tyre which is exactly over the centre must, as it is revolving in the same direction as the vehicle is moving onward, move at the rate of 18 feet in a second, but that part of the tyre which is immediately under the centre of the axle at the instant it passes the centre of the lens, as it is revolving in the opposite direction to that in which the vehicle is moving onward, will be absolutely stationary. I, of course, use the word instant in the same sense as I should use the word point in mathematics. Now, if the shutter be set just fast enough to render the vehicle sharp, the lower spokes of the wheel will also be sharp, but to get the upper spokes sharp it must be set to work twice as fast.—I am, yours, &c., J. TILFOR.

231, Elgin-avenue, W., November 9, 1901.

To the EDITORS.

GENTLEMEN,—Like most of your readers, I am afraid my elementary mechanics is somewhat rusty, but I venture to offer the following suggestions for your consideration on the subject of the photography of moving wheels.

In the first place, let us consider the rate at which a point at the top of the wheel is moving in regard to the camera fixed on the ground. The periphery of the wheel is moving round at the same speed as the carriage advances, hence the point at the top is moving forward at a rate due (1) to the revolution of the wheel equal to the speed of the carriage, and (2), in addition, is carried forward by the carriage at a similar rate; hence this point moves forward at double the speed of the carriage. This forward rate immediately begins to diminish, until, when the point under consideration has made a quarter of a revolution, it is moving forward at the same speed as the carriage —the movement due to revolution being at right angles to the forward movement has no effect in this direction. The forward rate still continues to diminish until the point reaches the bottom, when it is for the moment at rest on the ground, as the forward motion of the carriage is equalised by the backward motion of that part of the wheel.

From this it follows that the spokes at the bottom should photograph sharper than those at the top. In the case of the camera being carried along "by another car at the same rate of speed," the question of the forward motion of the carriage is eliminated, and the problem is reduced to that of a revolving flywheel, which, of course, does not change its position as a whole with regard to the camera, and hence all the spokes should be equally sharp (or blurred, as the case may be).—I am, yours, &c.,

SOLPHINE.

To the EDITORS.

GENTLEMEN,—As "J. M." seems likely to arrive at wrong conclusions from the contradictory answers he has received to his question, perhaps I may be allowed to make an attempt at rendering the matter clear.

With a moving vehicle, the bottom of the wheel for a certain brief period of time is stationary; the hub moves at the rate of the vehicle, and the top of the wheel at twice that speed. If, therefore, one-tenth of a second exposure with a fixed camera is just brief enough to render the vehicle sharply, one-twentieth second will be required to render the whole wheel perfectly.

Assume that the vehicle is moving at the rate of one inch per second, the top of the wheel is then moving two inches per second; but, if the camera is also moving one inch per second in the same direction, the hub of the wheel is stationary relatively to the camera, while the top of the wheel is passing the camera at the rate of one inch per second, and the camera is passing the bottom of the wheel at the same rate. The top and bottom of the wheel are, therefore, moving relatively to the camera, at equal speeds, and are equally well defined in the photograph. Further, one-tenth of a second renders the whole wheel perfectly, as no part of it is moving at a greater relative speed than that of the vehicle passing the fixed camera.

"J. M." is in error in assuming that the size of the wheel affects the question; whatever the size the top of the wheel always moves at twice the speed of the vehicle, which fact should always be taken into account when estimating the exposure. "Y." has stated the mechanical aspect of the question correctly, but makes a wrong assumption in stating that the movement of the camera makes "no difference on the definition of the spokes." On the contrary, all the spokes would be equally well defined, as explained by Mr. Nash.

It would be interesting to know how often this problem of the moving wheel crops up. I imagine about twice a year, in some form or other, ever since the production of the first instantaneous photograph. I would suggest the following as an attractive variation:—

If an exposure of one-twentieth of a second will render a wheel of a moving vehicle perfectly with a fixed camera, and one-tenth of a second will be sufficient if the camera is moving parallel to, and in the same direction, and at the same speed as the vehicle, what exposure will be required if the camera is moving in the same parallel line, and at the same speed, but in an opposite direction?

Another problem of a similar nature to the wheel problems is: If a man is walking at the rate of four miles per hour, what is the speed at which his feet move?

The first problem is easily answered, but the second is a very doubtful matter. Possibly it has been solved by experimental tests, and, if so, I should like to know the answer. Movement as regards the feet is very noticeable in most snapshots, even when taken at a fairly high speed.—I am, yours, &c., C. WELBORNE PIPER.

November 8, 1901.

THE CITY AND GUILDS EXAMINATION IN PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In your last issue you publish the Examiner's report on the above, and the questions set at the last examination; and, whilst carefully reading through the same, I must confess that, although a photographer of some years' standing, and one who has paid some little attention to the why and wherefore of various processes, insomuch that, taking them on the whole, I could have answered, more or less satisfactorily, all the questions set, except the photo-mechanical, I felt decidedly disgraced because I belonged to the noble army of ignoramuses, of whom the Examiners say, "Not one of them showed any knowledge of the simple and easy mirror method" of finding the equivalent focus of a lens.

Having thus learnt my true position of nescience, I set to work and carefully examined a few of the standard test books in my library to find this method. I began on Friday evening, gentlemen, and examined "A Treatise on Photographic Optics," by R. S. Cole, M.A.; "The Optics of Photography," by J. Traill Taylor; "The First Book of the Lens," by Welborne Piper; "Die Elemente der Photographischen Optik," by Dr. Schroeder; "Die Photographischen Objective," by Dr. Eder; "Theorie und Geschichte des Photographischen Objectivs," by Dr. von Rohr; "Photographische Optik," by Dr. Miethe; Dr. Vogel's "Handbuch der Photographie;" Fabre's "Traité Encyclopédique de Photographie;" Woodbury's "Encyclopedia of Photography;" Wall's "Dictionary of Photography:" not to mention such minor books as some by Chapman Jones, Abney, Sylvanus Thompson, Glazebrook, Coddington, Monckhoven, etc.

Midnight found me still searching for this elusive "simple and easy mirror method." At 2 a.m. my wife turned off the gas, and said she'd fetch the doctor if I didn't come to bed, for she felt sure I was going mad, and, if the baby woke up and saw me with my hair all standing on end, it would have a fit. So I went to bed—but not to sleep, for somewhere in my brain there floated a dim recollection of having seen this once; and, silently, I stole from my bed, and looked through fifteen years' volumes of THE BRITISH JOURNAL, but without success; and, as a dressing-gown and slippers is not the most

comfortable apparel at 5 a.m. in November, I again sought my couch, but no sleep visited me, or, only, in fitful snatches, till about 7 a.m. I fell into a quiet sleep, and dreamt I had found it, and started up yelling, "I've got it I've got it!" So I had, but it was my wife's hair, and the trouble this has occasioned is a serious matter: for, good and patient woman as she is, like all photographers' wives she declares she will divorce me à mensâ et thoro, till I learn how to behave myself. As for THE BRITISH JOURNAL, not another copy shall come into the house, she says, if it is going to make me behave like that.

Yesterday being Lord Mayor's Day, I did not go to business, so that the whole day I spent at the Patent Office library, searching for this elusive "simple and easy mirror method." I called at your office, but you were not in, and sadly I found my way home again, still baffled. In the evening I called on a friend, and asked him if he could help me, and the two of us spent the whole evening at my house searching for this fearful thing. Gentlemen, we nearly finished a bottle of whisky. The amount of my tobacco we smoked I dare not estimate, and at last, at 1 a.m. this morning, my wife said she would stand it no longer, and with tears in his voice, my friend left me, saying, "I won't sleep to-night till I've found it." Tired out, I went to bed in despair, and, what with the worry and the whisky, slept heavily, but, as I am told, still muttering in my sleep, "Problem: Given a mirror and a lens, how to find the equivalent focus."

At 6 a.m. this morning the whole house, nay, the whole neighbourhood, was aroused by a frantic ringing of the bell, and our front door knocker, and shouts of "Eureka! Eureka!" In hurried alarm I flung up the window, and in the front garden was my friend minus coat and collar, his waistcoat unbuttoned, and in a slipper; the other was discovered afterwards, he'd lost it on the road; but in his hand he had a fat green cloth-bound book, which, when he saw me, he threw up at me, and, with bad aim, broke the pane of glass in the window.

Instantly I rushed at it, heedless of the broken glass, and my bare feet. I found it was THE BRITISH JOURNAL ALMANAC for 1894, and on page 610 I found the simple and easy mirror method described in an article by Mr. C. H. Bothamley. I hurriedly slipped on my dressing-gown, let in my friend, and we fell on each other's necks and wept and drank whisky.

The language my wife uses now is awful. She is going to have you up for battery and assault, bring an action for criminal libel; and all because of this simple and easy mirror method. And when I explain things, or try to—for I can hardly get a word in edgewise—she declares, if you are not liable, the other fool is for saying such things.

As for my friend and I, we are simply wondering whether THE BRITISH JOURNAL ALMANAC is one of the recognised text-books for the City and Guilds of London Examination, and, if not, why not? And, if not, why such a sentence should occur in the Examiner's report.—I am, yours, &c.,

A. DUNDERHEAD.

P.S.—Monday.—The glazier has just been, and says it will cost 7s. 6d. for a new pane of glass, and my next-door neighbour, with whom I have been friendly, although he is a parson, has sent me in a formal notice signed by (4) other neighbours, stating that if such a noise is made again on a Sunday, they will have to bring the matter before the heads of my chapel, where I occasionally preach.

REDUCING THE WHOLE OF THE SILVER IN A PLATE.

To the EDITORS.

GENTLEMEN,—I think you must share the blame with me "in rushing my name into print." In your editorial remarks you said that "a lively meeting might be expected at the L.P.P.A. when the subject came up again," and, as I was absent as aforesaid, I thought an explanation might interest your readers. I don't want to bark too loud at my opponents—my bark is generally worse than my bite. I hope that what I am going to say will not increase the opinion of your readers as to the ignorance of my disputants, but "half the truth is worse than, shall I say, none at all." How can Mr. Grant reconcile the statement made to me that he had not seen Mr. Mackie's experiment, and how can Mr. Mackie explain the presence of exposure deep-marked registers on the plates? Methinks he will say that the action of the solvent had not been prolonged enough. If so, what is his experiment worth? The first plates I gave I explained that I had in error submitted the plates to the action of hydrochloric acid, and then to daylight, which darkened the films. I would like also to learn what conclusion Professor Haddon has come to concerning the controversy. He is one of the few members of the Association who can carefully and scientifically settle matters of this kind. He got two experimental plates from me to test. I have nothing to retract except that "I did not see any advantage in making silly or stupid experiments." Out of wrong good often emanates. I have made a discovery (or, at least, I believe so) re halation in gelatino-argentic films. When I return to England I will continue my experiments, and let Messrs. Grant, Mackie, and Co. know the results.

I admit that with some people it is necessary to use "extravagant and derisive epithets." I have frequently to call a spade by another name.—I am, yours, &c.,

A. L. HENDERSON.

Grand Hotel Peninsular, Madrid, Spain.

MEASURING THE INTENSITY OF LIGHT.

To the EDITORS.

GENTLEMEN,—Mr. C. J. Stokes puts some queries to me which were already answered in my communication. (En passant, I may point out to him that a clerical error I made was corrected last week.)

Mr. Stokes asks, in his first paragraph, the name a certain law is known by. There is no such law, and I pointed out the underlying error.

Mr. Stokes says that the statement "the quantity of light falling on a given surface, etc.," is only an approximation. He is in error. It is strictly correct, but could only apply, as I pointed out, when the receiving surface was the interior of a sphere with the light point at its centre. Mr. Stokes says "the problem of the illumination of a point on a sitter at a certain distance from a window, assuming the window to be the source of light, is in no essential different to many questions that every mathematical student of physical science has to tackle . . . and is solved by the laws of inverse squares, as above."

I did not write for mathematical students of physical sciences, but for the every-day photographer. The problem has often presented itself, and, hitherto, been usually wrongly solved. I gave a simple plan that any one ignorant of mathematics could employ; and that plan is correct. Mr. Stokes gives no practical plan at all.—I am, yours, &c.,

G. WATMOUGH WEBSTER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

H. Barrett, Spondon, Derby. *Photograph of General Sir H. Hildyard's reception from South Africa.*

G. H. Stanford, 190, Christchurch-road, Boscombe, Bournemouth. *Photograph of the King's yacht with "Ophir" in procession.*

T. McKey & Son, 62, Hill-street, Newry. *Two photographs of the Lord Bishop of Dromore.*

A. McFarlane, 46, Douglas-street, Kirkcaldy, Fife. *Photograph of plants.*

C. De Lavedré, 328, Renfrew-street, Glasgow. *Photograph of her Grace the Duchess of Sutherland.*

T. F. Forde, 15, Waterloo-place, Sunderland. *Photograph of the Sunderland Football Team*, 1901.

MOUNTING ENGRAVINGS.—"WIGWAM" asks: "Might a steel engraving be mounted by damping and using starch paste?"—In reply: Yes. But the print will require delicate handling while it is damp, as the paper will be very tender.

WHITAKER'S PHOTO STAINS.—"ORIENT" writes: "Can you favour me with the address of the makers of Whitaker's photo stains?"—In reply: We do not know these preparations by name; perhaps some reader can supply the desired information.

GUM MIXTURE.—"GUM" writes: "Will you kindly tell me a good mixture that dries smoothly, for gumming the backs of stamp photographs?"—In reply: A solution of dextrine in water, to which a very small proportion of glycerine is added, is about the best thing that can be employed.

GUM WATER.—C. S. writes: "Would you please inform me the formula for gum water; also what is added to preserve it?"—In reply: Simply dissolve the gum in cold water to the consistence desired. A few drops of any antiseptic, such as oil of cloves, or carbolic acid, will act as a preservative.

REPRODUCING ROYAL PHOTOGRAPHS.—C. H. F. writes: "I wish to know if, on paying permit to reproduce the King and Queen's photographs for jewellery, I could, before producing same, have them painted with their robes and crowns on; if, on so doing, should I in any way be liable?"—In reply: If you have paid for the right to reproduce the portraits, we do not see that you incur any liability in having them coloured in the way you propose, unless there was any agreement to the contrary.

COPYRIGHT.—S. GLASS.—If the copyright was registered in your name it was, no doubt, duly assigned to your employer, in which case you can have no copyright in it. Probably the copyright was assigned when the negative was parted with. If not, the holder has no copyright in it, nor has any one else.

CARBON PRINTS.—G. WALLACE.—The prints sent are not at all good specimens of carbon printing. They are deficient in half-tone, and the delicate tints are all washed away in the lights. Evidently the tissue was not in good condition when it was printed. That is the only comment we can make on the specimens.

S. writes: "Can you tell me the least distance that everything beyond is in focus for a Planar lens of 6½ in. focus, f-4, really f-$\frac{3}{8}$?"—In reply: The simplest rule to find the so-called fixed distance is, multiply 2.7 by the square of the focal length of the lens, and by the fraction expressing the aperture; therefore, in the case in point, $2.7\times6\frac{1}{2}\times6\frac{1}{2}\times\frac{1}{4}=28\frac{1}{2}$ yards.

ARTIFICIAL LIGHT.—S. J. asks: "What is the best light (artificial) by which to take photos with, and if there is any firm who make same, will you kindly give their address?"—In reply: The best artificial light for photography is, unquestionably, the electric. Both Morgan's and Adamson's systems are good. See their advertisements in our advertising columns, and write for their prospectuses.

SOLVENT FOR INDIARUBBER.—G. B. writes: "Kindly advise me the best way to dissolve indiarubber. I have tried benzine and carbon bisulphide, but without success."—In reply: The rubber should dissolve in either of these solvents, if it is of the right kind. Possibly you have used rubber that has been vulcanised. If so, that will account for your difficulty. Try with "masticated rubber."

INTERIOR PHOTOGRAPHY.—"INQUIRER" writes: "I have the interior of a wine cellar to photograph. No light whatever can get in. Can you recommend me a flashlight or artificial light to use for purpose." In reply: The work may be done with any of the well-known flashlights, or by the light of burning magnesium. The "Flashaxe," reviewed in our last issue, would seem to be well suited for the purpose.

HIRE OF FLASHLIGHT APPARATUS.—H. FINCH writes: "Shall be glad if you can let me know whether I can get a flashlight apparatus on hire for one night? It is wanted to take a dinner-party in an hotel."—In reply: We do not know, unless those who let photographic apparatus out on hire could also lend a flashlight apparatus. Better write to Morley and Cooper, Upper-street, Islington, or Sands and Hunter, Cranborne-street, if you do not know a friend who would lend you one for the evening.

REPRODUCTION FEES.—"VELOX" writes: "Would you kindly let me know what the usual sum is for a whole-plate picture accepted for publication in a weekly paper; also, if extra payment is made if used in two papers owned by the same firm."—In reply: It is quite a matter of arrangement. The minimum fee charged by members of the Photographic Copyright Union is half a guinea for sizes not exceeding the cabinet, and a guinea for larger sizes, up to 12×10. If the picture is used in more than one paper, an extra fee must be paid for the others. These are the minimum fees, but the members can, of course, charge as much more as they like.

FOCUS OF LENS.—"AMATEUR" writes: "I have been using a 7-inch focus lens and half-plate camera for figure studies, and find that this focus is too short, as is seen in photograph enclosed. May I ask what length of focus you would consider most suitable? Would a lens of 14-inch focal length be unsuitable for general landscape work if used with half-plate camera?"—In reply: For portraiture, to get the best effects, the focus of the lens should not be less than double the longest diameter of the picture. One of fourteen inches focus would be very suitable for figure studies, such as the one sent; but it would be almost too long for landscapes, as it would, on the half-plate, only include a very narrow angle.

VARIOUS QUERIES.—J. BROWN writes: "(1) As I wish to do some enlarging, do you consider Tylar's 'Dreadnought' acetylene generator to be perfectly safe and efficient? If you know of such a generator, other than above, will you kindly let me know? (2) Do you know if the 'Rystos' dark-room lamp can be supplied for oil? (3) Does any dealer sell a convenient thermometer for testing temperature of developer, etc.? (4) Do you think Baskett's method of reduction will harm a negative?"—In reply: (1) Yes, we believe it to be perfectly safe, but all acetylene generators should be worked with care. There are many other forms of generators advertised, most of which are good. (2) No doubt it could be, to order. (3) Yes, all dealers do. What are known as "Dairy thermometers" are very convenient for the purpose. (4) No.

FLASHLIGHT PHOTOGRAPHY.—C. H. P. writes: "I have to take some whole-plate flashlight photos of several brass plates about 20×18 (the plates), and should like to know at what angle to let the flash off, so as not to reflect the light back into the lens; and also, how to arrive at the angle quickly without a lot of measuring. I don't know the make of the flashlight, but it is a single flash, using Argentorat powder, worked by a spring striking a match."—In reply: The light should be at such an angle that the reflections from the plates are away from the lens. That will be secured by an angle of about 45°. But a deviation of a few degrees either way will make no material difference. Would it not be better to photograph the plates by daylight than by flashlight? There is no necessity, we should imagine, for a very rapid exposure.

UNDER-EXPOSED PLATES.—A. X. E. writes: "Last week I exposed a dozen ——— quarter-plates, and, on developing them, they all turned out like this one. You will see that the shadows and half-tones are little better than clear glass. I have used the same plates before with the same lens and stop, and with the same exposure that I gave these; so the exposure must be right. Can you tell the reason of these being so bad? I may say I am somewhat of a novice, as I only took up with photography six months ago."—In reply: The cause of the failure is under, very much under, exposure. You have not taken into consideration that the light has very much deteriorated during the last month or two. The negative sent should have received at least three times the exposure it had; then it would have been a good one. No apology necessary. We are always pleased to help novices.

RETOUCHING, ETC.—"TERRANT" writes: "(1) Would you please inform me if there is a gas lamp specially made for retouching by gaslight. I have never worked by artificial light. If there is not anything made specially, I should like particulars as to what height it should be, and the best position, so as to get one made. (2) I have a lot of negs. that I want to get the films off. Can you let me know if there is a chemical solution that will do it quickly."—In reply: For the moment we do not call to mind any lamp specially made for the purpose; but, no doubt, any of the large dealers can supply a suitable one. Better have one with an adjustable stand, so that its height can be arranged to suit the angle of the retouching desk. (2) Soak the negatives for a day or so in cold water, and then put them in hot. Then the film will dissolve off readily. A little common soda may be added to the hot water.

F. W. DONISTHORPE writes: "Can you tell me whether there is any substance which is transparent only to those rays immediately above the visible ones, the rays which are affected by sulphate of quinine, when they fall on it?"—In reply: We must confess that we know of no such substance. The nearest approach that we can think of would be a double screen of deep cobalt-blue glass, which would transmit nothing but blue and violet, which might be cut out with a pale chrysoidine collodion screen. This would probably suppress the whole of the visible spectrum, and yet transmit the ultra-violet rays; but even these would be to some extent absorbed by the glass. Of course, collodion films, stripped from glass, could be stained with methyl violet and chrysoidine, and would certainly transmit more of the ultra-violet; but the query is rather vague, as no idea is given for what purpose such a substance is required.

VARIOUS QUERIES.—"CURIOSITY" writes: "I will thank you for answers to the following in your JOURNAL: (1) Is there any advantage over glass in using ferrotype plate for glazing P.O.P. prints? If so, how to proceed? (2) Where can such be obtained, and its price, say, in pieces 10×8 inches, to hold two cab prints at a time? (3) Will albumen prints give equally as good results? Or are there any special preparations? (4) Is it necessary to become a member of the P. P. Association in order to get photographic goods at retail discounts, where to apply, and fee, if any, to be sent." In reply: (1) No, except that they are unbreakable, and, perhaps, the prints leave the ferrotype plates more freely than they may glass. (2) The plates may be had from any of the dealers. We cannot quote the prices, but they are very inexpensive. (3) Yes; and the treatment is the same. (4) Not if you are a bonâ-fide professional photographer. The subscription is five shillings a year. But the Association is only open to bonâ-fide professional photographers, and unless you are one, you are not eligible for membership.

STUDIO BUILDING.—"LIGHTING" writes: "The studio I work in is 21 feet long and 12 feet wide, with north light, and consists of one long top light (angle 45°) measuring 15 feet long and 5 feet broad. Below the top light is a wall 3 feet broad, and then comes two side lights 9 feet long and 5 feet high. On one end of the roof is built a tower, and in the afternoon, when the sun shines, it throws a shadow right over the top light, and there is also a balcony along the side of roof, which extends half way up the top light (see dotted lines in plan enclosed), which prevents a lot of light from entering. Now, do you think it possible to obtain good lighting in such a place, and, if so, could you kindly give me a few hints how to do so. I must inform you that it is impossible to make any alterations whatever in the construction of the studio; so you see I have to make the best of it. Now, Mr. Inglis, in his book on 'Artistic Lighting,' says: "A picture with more than one source of illumination is an artistic absurdity, an abortion—in fact, not a picture at all'; so, in consequence of this, I blocked up lights 2 and 3 with dark curtains, and I just use the top light, which means giving a good long exposure, as the light is never extra good. This answers very well for grown-ups, but for children and groups, who need, or, rather, you have to give shorter exposures, I am obliged to open out lights 2 and 3 in order to get more light, and that throws nasty lights into the eyes, and spoils the lighting."—In reply: We see no reason why good portraits should not be taken in the studio when the side lights are employed, because they, with the roof light, are, practically, one light, though broken up by the wall. The studio is, evidently, somewhat a difficult one to deal with, as its size is so small; but by a judicious use of curtains on the side lights, it may be overcome, particularly with the aid of reflectors in addition, to soften any strong shadows.

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EX CATHEDRA.

Commercial Lantern Slides.

Now that the dark evenings are upon us, many a photographer will lightly turn to thoughts of the optical lantern and its belongings. It must have occurred to the most superficial observer that of late years there has been a great improvement in the quality of the lantern pictures which are procurable at the best shops. Possibly, this is in great measure due to the circumstance that amateur photographers have been turning out such excellent work in this direction that there has been a distinct move upwards in the standard looked for by the general public. At one time the coarsest wood engravings were employed as copies. It was an easy matter, we may suppose, to turn up the subjects which required illustrating in the back numbers of newspapers, or books, and to photograph them. It mattered not that the pictures when thrown on the screen were masses of lines; they were pictures representing the scene, or thing, required, and nothing better was to be had. The advent of the half-tone block has changed all this. No longer does the artist draw on wood, with the melancholy reflection that his handiwork will all be cut to pieces by the graver, but he draws, or more often paints his subject on card, and after it has been photographed for production as a half-tone block, the original remains unimpaired. These original sketches, many of them of a masterly character, are, especially in the case of war scenes, of temporary interest, much used by the producers of lantern slides, and they are admirably adapted to the purpose. But it is more often the case that the original of some particular subject is not available, and we have to content ourselves with the impression from the half-tone block. It might reasonably be objected to on the ground that the dots, of which such a picture is made up, will show as dots of larger size on the lantern screen, thus bringing the slide under the same disadvantage as that produced from the woodcut. But it must be remembered that these dots in modern half-tone blocks are infinitesimal in size. They are not, for that reason, very obtrusive on the screen, and they can, as a matter of fact, be eliminated altogether by the simple device of throwing the picture a trifle out of focus when making the negative for the lantern slide. This little dodge, in practised hands, will produce pictures of very fine quality, and it is worth remembering when such work is in hand. It need hardly be pointed out that, as in the case of all copies from prints, a very slow plate should be employed, and precautions taken to get an absolutely clear image on a dense background.

* * *

History by the Cinematograph.

We have all heard of the man who declared his objection to doing anything for posterity, on the ground that posterity had done nothing for him. Happily, we are not all as selfish as that, and most right-thinking men feel a pleasure in the reflection that they will, when they retire from this life, leave something behind them which will benefit their descendants. Photographers are doing what they can in this way by picturing life as they have found it, and the historian of the future will be greatly helped by their labours. A hundred years hence the photographic pictures accumulated at the British

Museum, by the labours of Sir Benjamin Stone and others, will be a most valuable pictorial library for reference. What would we not give for a collection of such pictures referring to events which took place a century back, were such a collection possible? But as far as we can learn, no attempt has yet been made to make a national collection of cinematograph films. And yet in many respects such a collection would be far more valuable than any other form of picture. No great event takes place nowadays without the presence of a small army of cinematographers, the pictures being shown subsequently at the various music halls and other places where "animated photographs" form a regular feature of the entertainment provided. Is it well that these pictures, some of them of absorbing interest, should have a mere ephemeral life? Take, for instance, such a subject as the funeral pageant of our late lamented Queen. The progress of the cortège, from its start at Osborne to its conclusion at Windsor, was beautifully reproduced by many different cinematographers, and the pictures were shown all over the country. In like manner, the return of our future King and Queen after their tour through the vast Empire over which they will rule, was recorded by many cameras last Saturday week. The Coronation of King Edward VII. will again find the cinematographers busier than ever. And yet these pictures, which give delight to millions, will have their short day, and will be speedily forgotten. Would it not be well to store copies of these films under such safeguards that they will be available for the millions yet unborn? We feel that something should at once be done to attain this end, but we are not quite sure whether it would be wise to place too much reliance upon celluloid as the material for the preservation of such valuable documents. The negatives would probably have to be transferred to some other more lasting support.

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Identification by Photography. In a recent article upon this subject we endeavoured to show that the system of identifying prisoners by the photographs in possession of the police was likely, in the absence of other proofs, to lead to terrible mistakes. We have since noted that in a County Court case the judge refused to recognise a photograph as a trustworthy document, expressing the opinion that such evidence was unreliable. The widespread knowledge of photography which now exists has had the happy result of removing many misapprehensions regarding the camera and its work. Not many years ago the instrument was regarded as being as free from mendacity as that apostle of truth, George Washington. But it has since retrograded in public estimation, and is now known to be a most accomplished liar, when it suits its purpose to be so. It is a matter of common knowledge that all kinds of deceit can be carried on by the use of lenses of different focal length. The advertising house-agent can, by such nefarious means, turn a pigsty into a palace, or a suburban villa into a residential estate. Small wonder is it that images of the human countenance should be also rendered in the most untrustworthy manner. A case in point recently formed the subject of a letter in the "Standard," and we may take it for granted that this is not an isolated instance of mistaken identity by means of a photograph. The writer tells us that he had been staying in a country house, his host and hostess having previously never met him. Before his visit had extended very far he noticed that he was the recipient of unusual attention on their part, and subsequently learnt that they were attracted to him by the extraordinary likeness which he bore to a son whom they had lost. It seemed to them, indeed, as if the mourned one was again with them in the flesh, and they produced a photograph of the deceased in justification of their words. The writer of the letter says of this picture:—"I would have handed it to any one as a photograph of myself, and am confident that it would have been stated by more than one that it was the best likeness of me they had ever seen." Now, let us suppose for a moment that this gentleman had been arrested wrongfully on circumstantial evidence, and that he was unable, for some reason or other, to clear himself of the false charge brought against him. Next let us suppose that the photograph bearing that extraordinary resemblance to himself is found in "the rogues' gallery" in possession of the police. What chance would the hero of the story have of an acquittal? It would be well if our police authorities at Scotland-yard and elsewhere were to ponder over these things.

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Non-finality of the Aluminium Soldering Question. We have on several occasions quoted published formulæ for the soldering of aluminium; but there seems to be good grounds for saying the question is somewhat analogous to squaring the circle. Quite recently a writer in the "Journal of the Franklin Institute" said, "It is, nevertheless, true that an entirely satisfactory solution of the problem has yet to be found." He then goes on to point out the main difficulties to be met—the high heat conductivity of the metal, which abstracts the heat so rapidly from the joint and the ensuing galvanic action at the joint which quickly causes the corrosion of the aluminium. "It is comparatively easy to make an apparently perfect soldered joint," the adhesion at first being perfect; the corrosion sets in after exposure to the atmosphere for some months. Now, the ink with which the original of these remarks was written could scarcely have been dry when we find a correspondent of a scientific contemporary saying, with regard to the method of soldering, "This is quite easy. Aluminium may be soldered with ordinary soft tinman's solder (half and half tin and lead), with an ordinary tinman's copper soldering bit," etc. The precautions necessary are (1) an absolutely clean and perfectly tinned bit. The work rapidly dirties the bit, which requires frequently refiling and retinning; (2) absolute freedom from grit of any sort: hence the bit must on no account be tinned on a brick, but on a sheet of tin-plate, with spirits of salts (killed)." The best flux he gives as stearic acid. Finally, the writer states that he has had a joint "made for six months which has not failed."

* * *

A New Use of Cyanide of Potassium. Time was when the business of photography could not be carried on without a plentiful supply of this deadly poison: at the present time we should imagine the major portion of the photographers of the country have never even seen the chemical. A new use has been found for it by Mr. W. R. Beattie, in a report to the United States Department of Agriculture. His laboratory was infested with a plague of cockroaches and other insect pests. By a mechanical

arrangement he, when safe outside, lowered some cyanide into jars of dilute sulphuric acid; the fumes killed all the pests; they first came out of their holes, and then died on the floor, ready to be swept up next morning. We name the matter here because Mr. Beattie suggests the plan might be used for dwelling-houses, and any photographer with a bottle of cyanide handy might possibly try it. Our emphatic advice is, "Don't!" The fumes given off are neither more nor less than those of "prussic acid," the inhalation of which, in very minute quantity, would result in almost instant death.

* * *

Glass-making by Electricity. As is well known, the Jena glasses are all liable to the presence of air bubbles throughout their substance. Indeed, a notification to that effect is often sent out by the makers of lenses along with the lens itself on the occasion of a purchase. There has recently been constructed a novel furnace for melting glass entirely by electrically-produced heat, the whole installation being compact and small, in comparison with the huge structures usually associated with glass manufacture. It is stated that within half an hour after the ingredients for the glass are introduced, a glass bottle can be blown, made from the resulting glass. The point that specially calls our attention to this apparatus, however, is the fact that the glass in its progress from the opaque powder to the highly molten liquid, passes over a series of shelves with sharp edges, which have the result of discharging the bubbles of gas produced. It is within the bounds of possibility that some such arrangement might be successful with Jena glass, for though the bubbles are of not the slightest practical disadvantage, it is sometimes impossible to convince photographers of the fact.

* * *

Photographer's Right to Exhibit Portraits. In our Commercial and Legal column last week we gave a brief report of a case tried in the Sheriff's Court at Glasgow which is of more than passing interest to photographers. The action was "to interdict Messrs. Crow from printing, publishing, exposing for sale, or exhibiting in their studio in Buchanan-street, or on the walls of the stairs or passages leading thereto, or elsewhere, photographs of the pursuer's children." In giving his judgment, the Sheriff, according to the report, said, "I can see nothing to prevent a photographer enlarging a photo and hanging it on the wall of his studio, either for his own gratification or to show what he can do in the way of enlargement," and he therefore found for the defendants.

Now this judgment is diametrically opposed to that in the case of Pollard versus the Photographic Company, tried in the Chancery Division of the High Court of Justice, before Mr. Justice North, in December, 1888. The latter case seems to be practically on "all fours" with that tried in the Sheriff's Court at Glasgow. It was an action for an injunction to restrain the defendants from offering for sale or selling, exhibiting as an advertisement, or dealing with a photograph either as a Christmas card or otherwise. In delivering his judgment, Mr. Justice North said, "The question, therefore, is whether a photographer who has been employed by a customer to take his or her portrait is justified in striking off copies of such photograph for his own use, and selling or disposing of them, *or publicly exhibiting them by way of advertisement or otherwise* (the italics are ours), without the authority of such customer, either expressed or implied."

We here quote some further remarks of the learned judge. "The object for which he is employed and paid is to supply his customers with the required number of printed photographs of a given subject. For this purpose the negative is taken by the photographer on glass, and from this negative copies can be printed in much larger numbers than are generally required by the customer. The customer who sits for the negative thus puts the power of reproducing the object in the hands of the photographer, and in my opinion the photographer who uses the negative to produce other copies for his own use, without authority, is abusing the power placed in his hands merely for the purpose of supplying the customer; and, further, I hold that the bargain between the customer and the photographer includes, by implication, an agreement that the prints taken from the negative are to be appropriated to the use of the customer only."

Then follow the principles upon which the learned Judge based his judgment—quoting several cases bearing upon the point. In conclusion, Mr. Justice North said, "For these reasons the defendant is wholly in the wrong, and, as he denies the jurisdiction of the Court, the injunction must go as a matter of course, and as the parties have agreed that this motion is to be treated as the trial of the action, this injunction will be perpetual, and the defendants must pay the costs of the action." We have here merely given but a brief report of this important decision, but the full text of it will be found in the "Times" of the 21st of December, 1888, in which it occupies something like three columns, and, owing to the importance of the subject, alike to the public and photographers, the same issue has a leading article on the case. Now it would be interesting to learn if this judgment in the High Court of Justice was brought before the Sheriff at Glasgow, and whether, in spite of that, he gave the judgment he did, which is in direct opposition to it? Usually decisions in the High Courts are taken as precepts in the lower ones, and are acted upon as such.

* * *

Combined Toning and Fixing. It is tolerably well known that we are no advocates of the combined toning and fixing bath, for the reason that, unless it is used with more judgment than it is by novices—who, by the way, are the largest users of it—there is no certainty as to whether the prints are toned with gold at all, also whether they are properly fixed. At a recent meeting of the London and Provincial Photographic Association Mr. W. Thomas pointed out that the chief users of this method were amateurs, and that they rarely carried the toning to the purple stage, but removed the prints at an earlier one, when only a partial fixation had taken place. If an immersion of, say, 10 minutes in a solution of a given strength is necessary for perfect fixation, it is clear that if the combined bath contains that proportion of hypo, and the desired tone is obtained in four or five minutes, it cannot be perfectly fixed; hence so many faded prints that have been treated in the combined bath. In the olden days, when the combined bath was the only method of toning, there was no question of imperfect fixation, inasmuch as the bath contained a far larger proportion of hypo than the modern one does, and the toning was a very slow operation, seldom taking less than half an hour, and some-

times several hours—all this time the prints were in a strong solution of hyposulphite of soda, so that there was no question as to their being thoroughly "fixed."

* * *

The Poisons Act. As will be seen from a report in our last issue, a pharmaceutical chemist was censured by a coroner's jury and by the coroner for selling poison—cyanide of potassium—to a suicide, and not complying with the Pharmacy Act. During the inquiry the coroner pointed out that the chemist was required to register the date, name of poison, and the purchaser's, what the sale was for, and that the purchaser should sign for it. Moreover, that if the purchaser was not known to the chemist, that person must be introduced by some one known to him. There was no discretion in the matter, and if the chemist did not observe the law he ran the risk of a heavy penalty. The husband of the deceased complained in court that the chemist should not have supplied the poison, and had he not, his wife would probably have been all right. Now, we have more than once said that the greatest infringers of the Poisons Act are pharmaceutical chemists, though they are rarely, if ever, proceeded against by the Pharmaceutical Society. One is rather inclined to speculate as to whether proceedings will be taken in this case. They certainly would if the seller had been a photographic dealer, or other than a pharmaceutical chemist. By the way, we have before commented upon the charges made by chemists for the scheduled articles, and in which they have the monopoly, which are sometimes required for photographic purposes. In this case we note that one shilling was charged for the two ounces of cyanide, equal to eight shillings a pound. The price of the commercial article, which we may suppose was supplied, as it was said to be for electro-plating, is from one shilling (less in quantity) to two shillings per pound.

PROXY VOTING AT THE ROYAL PHOTOGRAPHIC SOCIETY'S MEETINGS.

THERE was unfortunately a trifling error in our paragraph last week, in which we dealt with proxies for the R.P.S. meetings. In the last paragraph, and in the sixth line from the end, the word "either" should have been "neither." The paragraph will then read: "It is unfortunate that amendments cannot be moved at the confirmatory meeting, but if members neither wish to support nor oppose the resolutions now standing—in other words, to propose amendments—this can still be accomplished by twenty members demanding that a special meeting be called, and specifying the purposes for which such meeting is to be summoned."

The crux of the whole situation lies in this paragraph, but let us explain matters in language which can be plainly understood by every one. We have been to some trouble to fully show that proxies may be used at the R.P.S. meetings, and doubtless by now this fact is fully recognised by the officers of the Society. That this was news for them is unfortunately a fact, as to our knowledge some of the leading executive members were utterly unaware that members who were not actually present had power to influence the result of a meeting. Now, if these gentlemen were ignorant of this elementary rule under which the Society is governed, how much more can we not suppose the general mass of members to be labouring under a similar misapprehension!

The affairs of the Society are at a very grave crisis indeed, and those who are best able to judge of such matters have more or less reluctantly come to the conclusion that the internal management is much in need of reformation, if the Society is to carry out more energetically than in the past the object for which it was founded. Leaving this point for the present, we will confine ourselves to the explanation of the importance of proxy voting to the members, and other matters connected with the legal side of the question to which their attention should be directed. The meeting that was called for Monday, November 11, for the purpose of considering, and, if approved, of adopting certain proposed alterations to the articles of association, must be followed by a second meeting, called the confirmatory meeting, at which the resolutions passed at the first meeting are either adopted or thrown out. As the law stands, it is not possible for any one to amend a resolution passed at the first meeting, his only power being to either support that resolution or vote against it. If the requisite majority vote in favour of the resolution it then and there becomes a binding statutary regulation on all the members. Now, since the first meeting this great and important point of proxy voting has been raised, and we feel sure that many members who did not attend on Monday week at Russell-square will avail themselves of this opportunity to register their votes. Can they do so? Certainly; there is nothing to prevent them sending in their proxies for the confirmatory meeting, but they can only vote for or against the resolution which was passed at the first meeting; they are unable to propose any alteration to it. And this is just where the shoe pinches.

There surely must be many members who were unable to personally attend on the first meeting, and who did not know that they could vote by proxy, who will wish to propose some alteration to the resolutions passed at that meeting; but, though they are perfectly entitled to send up their proxies for the confirmatory meeting, they can only vote for or against the resolutions passed at the first meeting, and not amend them by any alterations which they may consider desirable. This fact seems better known than the even more elementary one of the power of voting by proxy, as we are informed that a requisition was signed by twenty-three members to call another meeting to again reconsider Rule 37 (as to nominators' names). Now suppose, instead of demanding this fresh meeting, the matter had been allowed to stand over to the confirmatory meeting, what would have happened? Why, in this particular case, since the proposed alteration was not carried by the requisite majority, the rule stands where it was before, and consequently at the confirmatory meeting if there were more "Ayes" than "Noes" the old rule is once and for all established as valid, whereas if the order had been reversed the matter would have to come, we presume, before another meeting. These twenty-three members, however, rightly dreading lest the first case might happen, have taken the bull by the horns and referred the whole question to another meeting, where it can be more thoroughly thrashed out, and, if necessary, amended. We congratulate these twenty-three gentlemen on their firmness, and sincerely hope that they may meet with the success they deserve. They have placed the interests of the Society before their own personal aspirations, and if the other members—every one of them either personally or by proxy

—come in and take part in the discussion we shall be able to obtain the true and whole opinion of the members on the question before them, which certainly was not the case as the result of the meeting held on the 11th inst. We only wish they had not isolated this one question, but rather had referred the whole agenda to another meeting, as we do not doubt, now that members know proxies may be used, that many more votes would have been recorded, and thus the result would have been a truer expression of the opinions of the members.

DOUBLE OR COMBINATION PRINTING.

The above heading may possibly bring a smile to some of our older readers, particularly when they find that what we have to say is about as old as the hills. Yet those who read the Answers column of the Journal must have frequently noticed the queries as to the "simplest"—simplicity usually seems the chief feature—way to replace a defective portrait in a group by a more perfect one, or to introduce a figure that was not present when the group was actually taken. Now, it is a somewhat curious fact that nearly, if not all, these queries emanate from professional photographers, and not from amateurs. It would almost be surmised that the former would have understood their business, or, if not, possessed ingenuity of their own sufficient to accomplish such a simple matter.

At one time an important qualification in a printer was that he was able to do double printing, for in the old days it was frequently necessary to change a background, or to print in a false one, or to combine two or more negatives in one picture. No such qualification in a printer now seems to be looked for, useful as it may be at times; and, stranger still it is, many employers are also ignorant on the matter, and therefore are not able to instruct their assistants. As illustrating what may be done by double, or multiple, printing, it may be mentioned that most of the pictures by the late Mr. H. P. Robinson that were shown at the late Exhibition of the Royal were printed from two or more negatives. The famous picture, "The Two Ways of Life," by the late Mr. O. G. Rejlander, was built up from between thirty and forty separate negatives.

There are several ways by which double printing can be carried out, all of which are good if ordinary care and a little skill be bestowed on the work. Two systems may be followed: one is to work by double printing on the paper; the other to reproduce the negative through a transparency in which the combination is made. If, say, only a few prints are required, the first-named system will involve the least trouble. But if a large number have to be done the other is the best, inasmuch as the prints are made at a single printing instead of at two or more. Combination printing may be done in two ways—masking and vignetting. The latter requires more skill and experience than the former, though, perhaps, on the whole, when skilfully done, it is the best. The one that is the most generally practised is the masking system. We will here briefly describe how it is followed.

Let us take, by way of illustration, a group of persons in which it is required to replace one or two faulty portraits by more satisfactory ones. Supposing we have two negatives of the same group—for it is very usual to take important groups in duplicate—in which some portraits are better in one than they are in the other, and it is required to get a satisfactory whole. By one plan we proceed to block out neatly with black varnish the faulty figures in the generally best negative, and all the other portions in the other one. When a print is made from this negative, of course, it will only have the figures it is desired to introduce on a white ground. This print is then accurately placed in position on the first negative, and printed in the ordinary way. If this be neatly done there should be no indication that the picture was printed from two negatives.

The plan followed by the majority of printers of the old school was not to block out with black varnish, but to make prints on thin paper and then carefully cut out the different figures, and fasten them by gum to the principal negative, using the other portion as a mask. These masks, when cut out, it may be mentioned, were exposed to light to blacken the paper before it was affixed to the negatives. In cutting out the masks, or in blocking out with the black varnish, it is better to err on the side of a slight over rather than underlapping, as then, if a light edge results, it may the better be touched out when the picture is finished. If, however, the work is neatly done no retouching will be required. It goes without saying that the two printings must be carried to exactly the same depth, otherwise the introduced figures will not harmonise with the others.

Of course, a figure that was not included in the group when taken can, in the same way, be introduced. What we have to do in this case is to take a print from a negative of this person on paper, preferably a little larger than the original negative, and cut out the figure and fix it in position on it. The counterpart is then stuck on the small one, and a print made from it, which, of course, is the figure only on white paper. This print is then arranged on the large negative so that the figure is covered by the mask on it, and then printed.

Here is another way by which a single figure may be introduced which is very simple, and for which reason it may commend itself to some. The background of the figure to be introduced is blocked out, either with a paper mask or with black varnish, and the figure printed on paper of suitable size. The printed figure is then neatly painted over with gamboge, which is allowed to dry. The print is then put upon the group negative—the already printed figure being arranged in the position it is to occupy—and printed in the ordinary manner. In this second printing the gamboge protects the printed figure from further action of light. When the silver is washed out of the paper, prior to toning, the gamboge is washed away at the same time, leaving the print intact and ready for toning. This method, it may be mentioned, is an adaptation of that published many years ago by Mr. Edge for introducing natural backgrounds in portraits taken in the studio. In this method either albumen or collodion paper should be employed, as the gamboge would be liable to leave a stain on a gelatine paper. A very important point in connection with double printing must be observed, namely, to keep the paper in the same hygroscopic condition in the two, or more, printings, otherwise accurate registration will be an impossibility. Above we alluded to combining negatives so as to obtain the pictures at one printing, but for want of space that cannot be dealt with in this article.

THE LATE VALENTINE BLANCHARD.

THE ranks of the veteran photographers are rapidly thinning. With Valentine Blanchard, who died on the 14th inst. at Herne Common, near Canterbury, after a long and painful illness borne with the utmost fortitude, may be said to have passed away the last of that brilliant band of the sixties, who, when the possibilities of pictorial portrait photography were denied and sneered at, did so much to raise its status and lay the foundations of what it has become to-day. Francis Bedford, O. G. Rejlander, T. R. Williams, James Mudd, H. P. Robinson, Robert Falconer, and now Valentine Blanchard are, it is to be feared, but names to the latter-day generation of photographers; but for all that their work is a reality and its influence exists in spite of the vagaries of fashion.

Valentine Blanchard must have been an artist in whatever pursuit he chose to engage. His critical faculty was strong and his judgment sound and acute. With the bent of his mind it is not at all surprising that, having served his apprenticeship to a printer at Wisbech (Blanchard's native town), he should cast printing aside and take up what then seemed a magical combination of science and art—Daguerreotypy. It was up-hill work in those days for every photographer, and Blanchard went through all grades, Daguerreotype, Talbotype, the glass positive when collodion revolutionised everything, the carte-de-visite mania, and so on upwards until Adam Salomon startled the world of portraiture by productions of which no one then had dreamed.

Always an original thinker and experimentalist, Valentine Blanchard early saw the artistic possibilities of the stereoscope and instantaneous photography. Despite the modern dry plates, no better rapid pictures—certainly no more artistic ones—have been produced than Valentine Blanchard's stereoscopic views taken in the sixties and early seventies. Cloud effects, heaving waves, the turmoil of traffic in the London streets—nothing came amiss to him, and when the labours, the difficulties, the uncertainties of the wet process are remembered, the results he obtained must be considered nothing short of marvellous. Valentine Blanchard, however, was essentially a portrait photographer, and when some half-a-dozen of the pictures of Adam Salomon (whose work made so great a sensation in the Paris Exhibition of 1867) were shown for the first time in London, Valentine Blanchard recognised their epoch-making value, and was the first to follow in the footsteps of the talented Frenchman. From this time henceforth Valentine Blanchard was an adherent of the forcible style of portraiture, and the breadth and dignity gained from the abolition of the white mount.

On the walls of the Whitefriars Club are to be seen to-day what is an absolutely unique collection of photographs, the portraits of the members including such men as Tom Hood, William Black, Charles Gibbon, Barry Sullivan, William Creswick. Interesting as many of these photographs are from the personalities represented, they are more interesting as pictures. The posing, the lighting, the balance of light and shade reach a very high standard, and as a whole they present a harmony of effect very remarkable. Many of these photographs are thirty years old, and, being on albumenised paper, do not do justice to the negatives. We believe these negatives are still in existence, and, if the old albumenised prints were replaced by platinotype or carbon, the genius of Valentine Blanchard would be shown in a manner little dreamed of by those who have only seen the pictures in their present stage.

For years Blanchard was an exhibitor at the annual collection of the Royal Photographic Society, of which he was one of the Vice-Presidents, and some of his pictures, notably one entitled "The Zealot," created a sensation when it was discovered they were taken with a single lens. Blanchard, while not going so far as some of the later exponents of out-of-focus work, was always opposed to microscopic sharpness, and the diffusion of focus he gained by the use of a single lens was at once recognised as a step in advance towards the plane of art.

Few men had a greater mastery over the intricacies of lighting the sitter, and, fertile of resources, and absolutely sure of the effect he wanted, he could produce admirable portraits in studios which would be the despair of ordinary men.

Always an indefatigable technical worker, an earnest student of chemistry and a keen observer, photographers owe to him much that was novel and useful at the time, but which may now have been forgotten.

His method of producing platinotypes in pure black resulted in some delightful examples, and a small exhibition of specimens some ten years ago attracted considerable attention. He was also the first to advocate making large transparencies from small negatives, the contact print practically becoming a paper negative. Some of these examples were so successful that they deceived many experts, who imagined they had been taken direct.

As a man whose knowledge was ever at the disposal of those who sought it, Valentine Blanchard will always be remembered by those who came in contact with him. He had hosts of friends, professional and amateur, and his geniality, his courtly and kindly manner, his entire absence of self, endeared him to all.

Valentine Blanchard for some years previous to his death had given up professional photography, and his name was frequently to be seen among the judges at the various prominent photographic exhibitions. In this capacity his impartiality, his fearless independence, and his mature judgment were always appreciated, while the personal charm of his character made him welcome wherever he went. Valentine Blanchard at the time of his decease was but a few days short of his seventieth birthday.

AN OPEN LETTER TO THE MEMBERS OF THE R.P.S.

[By a Ten Years' Member of the Council.]

I PRESUME that in the ordinary course of events you will not only have received the circular calling the special general meeting for last week, but that you will have carefully considered the propositions put forward by our President, which propositions were also put forth at some length in his presidential speech at the New Gallery. You will, therefore, be in a position to judge for yourselves whether they made for the good and progress of the Society, or were merely revolutionistic, for the sake of sensation-mongering. Those who know Mr. Dallmeyer will at once set on one side any idea such as this last, and will give him credit for merely having the good of the Society at heart.

Many of them, particularly the earlier ones, were merely verbal alterations in the articles of association, to render clear doubtful points, or to make the work of the Society smoother. Yet, at the meeting, these met with an opposition so bitter that it very soon opened the eyes of many of us who were present there, that practically a Council caucus had been formed to defeat everything put forward. Not only was this evident, but, unfortunately, two or three members of Council seemed to have deliberately set themselves to waste the time of the meeting by frivolous objections and still more puerile arguments, so that they might either tire out their opponents—that is, those in favour of reform—or else weary the President into losing his temper.

Luckily the verbal alterations were practically carried, and the first fierce fight took place over the proposition to abolish the honorary secretaryship, and institute in its place a paid post, and I regret to say that this was lost, for under a rule it is necessary for three-fourths of those present to vote in favour of it.

The strongest arguments put forward in support of the retention of an honorary secretary were—first, the cost, estimated about £200 a year, advanced by the Hon. Treasurer; and, secondly, that it would be a pity to do away with a post which enabled the Society to have the services of eminent photographers. In other words, why do away with a post which enables some of the office-seeking and otherwise inconsequent members to make a position for themselves?

The truth about this post was, no doubt, unintentionally given away by Chapman Jones, who claimed to speak with the authority of some years' experience as honorary secretary, for he said that it required the attendance of an honorary secretary one hour a day and if he did not give that one day he had to give two the next, and so on, or seven hours at the end of the week. The Honorary Treasurer says we shall have to pay some one £200 a year for one hour's work a day. How many of us would like to get a post like that; and I for one am quite prepared to throw up my present job and work as

long as I do now—namely, eight hours—at the same rate of pay, for £1600 a year is not picked up every day.

Another abuse—namely, the publication of the nominators' names—which would have been rectified had the President's proposal been adopted was lost by 0.25 of a vote, for under the before-mentioned rule it requires three-fourths of those present to vote in favour, and there were 75 present and 56 voted for it, and these numbers were obtained only after a dispute and a demand for a poll, that the Council caucus thus defeated us, and after two members had left the room, under the supposition that it was all satisfactorily settled in favour of a change.

It is a well-known fact that those members with the biggest list of nominators' names get elected on the Council, and this has been grossly abused in the past, and by one of those who was most strong and bitter in his opposition. The reason of this opposition is not far to seek. Without the long list of nominators' names these homunculi—and this homunculus in particular—would lose their seats, and take away that and they sink into the paltry insignificance which is their just due, and which is so bitter to them.

You will all see the report of the meeting in the "Journal" of the Society, and you will see also those who opposed the much-needed reforms, and can further the progress of the Society and obtain a thoroughly respectable working Council by striking through the names of these obstructionists, but you cannot see the bitter venom and spite shown by some of them at the aforesaid meeting.

I would also point out to you that a special confirmatory meeting must be held, and that you have an enormous power in your hands of voting by proxy, and therefore I trust that all those members—particularly country members—who cannot attend, will exercise their right, and send in a proxy in support of the President. A proxy must bear a penny stamp, which must be cancelled by the person sending the proxy. It must also specify the date upon which the meeting is to be held; and, further, the proxy must be received at the office of the Society seventy-two hours before the meeting.

I have been a member of the Society for many years, and, speaking from the experience bought by a constant attendance at the meetings of its Council, including the present one, I am firmly convinced that it behoves us all to support our President in his much-needed reforms, and to show the little-minded members of the Council caucus and the nonentities who follow their lead that we do not want them, but good men and true, who will not seek office for their own aggrandisement, but for the good of the Society.

What is wanted is a live interest in the Society by its country members, and an adequate representation on the Council, and then we shall find the Royal Photographic Society taking up the position which is its due, but which it has never yet attained.

THE APOCHROMATIC COLLINEAR LENS.*

II.

A CONSIDERABLE advance made a few years ago was the Zeiss triplet, which was constructed by Rudolph on Abbe's plan. The correction for axial rays was excellent, but unfortunately the field of view covered was not larger than that of the ordinary aplanatic lenses. This, as well as the want of durability of the special Jena glass used, is probably the reason why these lenses did not come into use.

Although the researches of the two last-named opticians took place towards the end of the last century, it has been only within the last few years that the requirements of several branches of practical photography have become so important that the need has arisen for a photographic lens having complete colour correction and especially so in the three-colour processes for printing in colours. In the case of the ordinary photographically achromatised lens, i.e., that in which the most powerful physiological and actinic yellow and blue rays are united, the image obtained by the rays of longer wavelets, namely the red end of the spectrum, lies nearer the lens than those formed by the yellow and light blue rays. The extreme degree of accuracy required for three-colour work, as regards the superimposition of each of the three coloured images, makes the slightest difference in the size and position of the three images extremely damaging as regards the correct mixing of the colours. This is especially noticeable in the contours of objects. It is very desirable to modify the correction of the ordinary photographic lens, so that the special requirements of three-colour process work may be met. Whatever may be done optically or mechanically to reach this end, nothing can be as efficient as improvement in the degree of the achromatism of the lens used.

I hope to have achieved this result by means of the lens which I have now the honour of bringing before you. It is the apochromatic collinear lens, and has been made according to my calculations.

The following details about these new lenses will, I hope, be interesting:—

Firstly, regarding the theory, as previously explained, the secondary spectrum in a system of lenses will disappear when the partial dispersions of all the glasses used are equal to each other. We will now see how this is carried out with the apochromatic collinears. They consist of two holo-symmetrical halves, each of which is formed of three lenses cemented together. The optical details of the three kinds of glass used for this construction are shown in the following table:—

	n_O	V	$n_F - n_C$	$n_D - n_C$	$n_F - n_D$	$n_{G^1} - n_F$
Heavy Baryta Crown	1·6080	56·7	0·01072	0·00315 0·294	0·00757 0·706	0·00612 0·571
Crown with high dispersion.	1·5145	54·5	0·00943	0·00277 0·294	0·00666 0·706	0·00543 0·576
Borosilicate flint ...	1·5408	50·7	0·01065	0·00313 0·294	0·00752 0·706	0·00613 0·576

If you compare the three rows of figures with each other, as in the first example—hard crown and dense flint, you will find that the partial dispersions between C and D, and naturally also between D and F, are equal to each other. This therefore means that if the red rays are united with the light blue rays, they will also be united with the yellow and green rays. In the blue part of the spectrum the case is slightly different. The second and third glasses possess the same partial dispersion between F and G, while the first one differs to the extent of five units of the third decimal point. Actual trials, however, show that this small disproportion is of no consequence. Even in the case of an extremely sensitive telescope object glass, it could only be seen by using equally sensitive methods of testing, which do not come into question in the present case. Moreover, the influence of this small error in the violet rays is reduced by being spread over the whole spectrum up to the C line.

The result is that within the intervals from C to G the colour correction is complete, a fact that has been proved by practical trials in many ways. In by far the greater number of cases the lens will be used for process work; it therefore seemed to me to be useless to give the instrument a larger relative aperture than f-9, and it is upon this aperture that I have based my calculations. It also seemed inadvisable to go beyond this figure, because with the long foci in which this type would usually be carried out, the unavoidable stray reflected light would influence the sharpness of the image if larger apertures were used. It is interesting also to observe that the improvement in the chromatic correction has resulted in an improvement in the correction for spherical aberration, and in reference to this matter the following should be noticed:—The spherical correction of an optical instrument, that is the rational compensation of the remaining error, which occurs on account of the different degrees of refraction in the different zones of lenses, is generally arranged for the particular part of the spectrum which has the greatest activity; for example, in the yellow-green rays for ordinary telescope objective glasses. From this it follows, as a general rule, that the compensation of the spherical aberration becomes so much the worse, the farther it is from the position of the greatest activity. The constructor of an optical system has to bear in mind that these departures from the best compensation remain within reasonable bounds. The space within which the spherical aberration of a certain interval of the spectrum moves is called by Abbe the chromatic difference of the spherical aberration. The influence of the same becomes more and more dangerous if the aperture of the lens be increased in proportion to the focus, and for this reason the correction of spherical aberration with apochro-

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* Concluded from page 695.

matic microscope objectives, with a large aperture, has to be calculated for several positions of the spectrum instead of for only one. Theory and practice have shown, however, that the chromatic difference of spherical aberration is comparatively small whenever the aperture is only a moderate one, as, for instance, f-9. It is without influence on the quality of the image, even in the case of a photographic lens from which the same degree of accuracy is not required, as in the case of a telescope objective.

All this proves to be the case with the apochromatic collinear. Taking a lens of 100 mm. focus, and following the rays on trigonometrical calculations, it is found that the spherical average error or zones for the position of the best correction only measures .3 mm. This figure permits a very good definition in the centre of the plate. The chromatic difference of the spherical aberration is .4 mm. This also is only a small amount, and it would be useless work to correct it by a compensated construction.

The object glass comes within the Abbe sinus conditions, and is free from coma.

Regarding the theoretical calculation of the astigmatism and the curvature of field, it rests on the fixing of the image point of a thin ray of light for both the meridional and equatorial sections. The figures obtained this way permit us to suppose that the astigmatic flatness of field is good, and this is proved by the results obtained in practice.

Very important indeed is the accurate test of the results given by this lens with light of different colours. The simplest test that a photographer can conduct is to make direct exposures in the camera. The results obtained in this way fully confirm the theoretical estimations. The images, which the apochromatic collinear gives, of an object illuminated by any kind of monochromatic light, fall in the same plane, and are identical in size. The trials made in my own studio are fully confirmed by numerous experiments made by a number of process workers.

Regarding the small amount of spherical aberration that is found, theoretically, the sharpness of definition in the centre of the field, on account of the apochromatic colour correction, has a degree of precision and fineness that is considerably in excess of that obtainable by ordinary lenses. As in the case of telescope and microscope object glasses which have been corrected for the secondary spectrum, the definition is considerably increased. This enables the sharpness of definition necessary for process work to be obtained with larger stops, and, owing to this, the time of exposure is naturally reduced.

In accordance with the results obtained mathematically, actual photographs prove that the definition on the margin of the field as far as the anastigmatic flatness of field extends is especially brilliant.

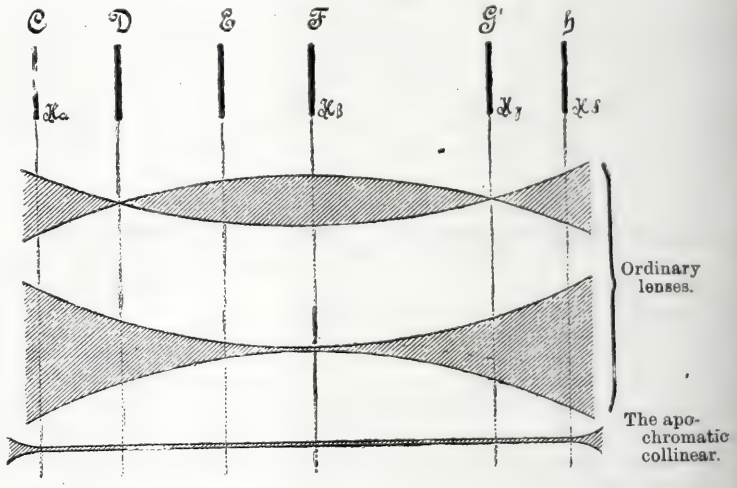
The apochromatic collinears are at present made in four sizes, 12, 16½, 23½, and 31½ inches focus, and the sizes of plates which the four lenses cover are respectively 10×8, 20×15, 24×18, 28×22 inches.

I would draw your special attention to the reproduction of a copper engraving, 18 inches by 24¾, taken with the 16½ inches focus lens, stopped down to f-25. Two things can be seen; firstly, that the necessary sharpness for this kind of reproduction can be obtaind with the stop f-25, which naturally involves a considerable reduction in the time of exposure; and, secondly, that the extent of the anastigmatic field of view is as large as the figures given above. You will, moreover, observe that there is no trace of distortion. The example clearly proves the efficiency of the lens for modern process work.

The following details of a few tests which have been made in order to show not only the kind of colour correction, but also the exact extent in figures, are given. This can be done by using a magnifying lens or a telescope eye-piece in connection with the lens as a telescope. The amount of magnification used for these experiments was 40 times. With a lens of 23½ inches focus a magnification of 60 times is equally possible. Firstly, it was seen that by a movement of the eye-piece from the focus of the lens when observing a black object with the sky as a background, the secondary colours that otherwise would be unavoidable were absent, and, secondly, that when accurately focussed the image was seen to have the same properties as would characterise the image on the ground glass.

A second test is extremely sensitive, and shows the secondary colours of a telescope objective at once and gave very satisfactory results. The apochromatic collinear 23½ inches focus is used with an astronomical eye-piece of five-eighths of an inch focus as an astronomical telescope. We must observe the sky through any two black surfaces which are near to each other, such as, for instance, two chimney-pots. If we were to cover half of the collinear lens with an opaque card parallel to the side of the chimney, no difference is seen beyond the natural reduction in the brightness of the image. The sides of the chimney will be seen black and white, while with every object glass which has a secondary spectrum with this test the well-known secondary colours, light green and purple red, will be seen on the sides of the chimney.

An extremely useful method of testing was described by H. C. Vogel, the present director of the Potsdam astrophysical observatory. If an optical instrument be achromatised for photographic work, the rays of the greatest physiological and actinic brightness are united in one point. This is not taking into account the spherical aberration. As a rule, the rays between the physiological and actinic ones come together nearer the lenses than those of the ultra-violet part of the spectrum. At the same time the red, light blue, and violet rays focus in small circles in front of the focus for the actinic and physiological rays. The diameter of these circles depends on the extent of the



secondary spectrum. If we place a direct-vision prism between the eye and the eye-piece, the image of a bright point appears as a spectrum with varying breadth. In the positions for which chromatic correction has been made it appears narrower, while at the middle and outside parts of the spectrum it appears wider. This test is one of the most valuable, as it enables us to measure the amount of the secondary spectrum. If, for instance, when the yellow sodium lines and dark blue hydrogen line Hγ are found in focus the difference between the F line and the yellow can be measured by moving the eye-piece till the focus has moved to the F line. The difference in the position of the eye-piece in both places is then equal to the difference of both images for the colours named.

The appearance shown by the apochromatic collinears with this test is quite different from the above description. If a point of light is sharply focussed with a magnification of forty times, the point is seen not as a broad spectrum, variable in width, but as a fine drawn-out spectral line which only broadens in the infra-red part of the spectrum, which hardly effects photography at all. This shows that rays of different colours come together in one point and that the difference in focus for the secondary spectrum is completely removed. In order to be quite perfect the test requires perfect achromatism of the eye-piece and also of the eye of the observer. If the latter cannot be carried out the chromatic error of the eye-piece and of the eye can be measured in a similar way by means of prisms and an artificial star, and can then be taken into account in estimating the aberrations of the objective.

In conclusion, I should like to mention that the new instrument is very useful for a few other branches of photography; for instance, astro-photography, where rapidity is not so important as large field of view, and specially if accurate definition is required. From the experiments made by Professor Wolf, of Heidelberg, with apochromatic telescope objectives, the conclusion has been arrived at that the images of stars obtained by the apochromatic collinear give considerably more favourable results for measurements than those obtained by lenses.

having the ordinary photographic correction. This lens will also be of some use for micro-photography, whenever three-colour work is desired with low magnifications. The recent publications of Professor Gaylord, of Buffalo, would seem to indicate that three-colour reproductions of pathological preparations will shortly come to much greater use. I hope the experiments Professor Gaylord is making with a short focus apochromatic collinear will lead to exceptionally good results. The principal use, however, will remain for process work, and the good results already obtained will, I think, form the best proof of this.

DR. HANS HARTING.

THE THORNTON-PICKARD COMPETITIONS.

THE Thornton-Pickard Manufacturing Co., of Altrincham, write:—"We beg to inform you that the judging of the photographs received for entry in our recent competition has been completed, and cheques sent to the prize winners. That the popularity of the competition is increasing is proved by the greater number of entries, whilst the difficulty experienced in awarding the prizes shows that the general standard of work is more uniform than that sent in for previous competitions. A copy of appended circular, giving the names and addresses of the prize winners, has been posted to all competitors. The prints and negatives belonging to those not fortunate enough to secure prizes are being returned if stamps have been sent to cover postage." The following is the list of prize-winners:—

Class I.—For Photographs taken with the Thornton-Pickard Camera and Shutter.—First prize, £15, Andre Callier, 88, Chaussée de Courtrai, Ghent, Belgium; second, £10, G. R. Ballance, Schenkels Hotel, St. Moritz, Davos; third, £5, Miss Whieldon, Lillington, Leamington Spa; fourth, £3, T. K. Evans, 7, Clarendon-villas, Oxford; fifth, £2, Mrs. Newman, York House, Chorlton-cum-Hardy, Manchester.

Class II.—For Photographs taken with the Thornton-Pickard Focal Plane Shutter.—First prize, £15, W. F. Brown, 180, Willis-street, Wellington, N.Z.; second, £10, Graystone Bird, 38, Milsom-street, Bath (conjointly with Eddie Madge, West-End Studio, Frogmore-buildings, Abergavenny); third, £5, Dr. Heatherley, Endellion, New Ferry, Cheshire (conjointly with J. Willis Grundy, 22, Steven-street, Stretford, Manchester, with W. Kilbey, 57, Pagoda-avenue, Richmond, Surrey); fourth, £3, Dr. Frechon, Blongy (Seine-Inférieure), France; fifth, £2, F. Spalding, 4, High-street, Chelmsford.

Class III.—For Photographs taken with the Thornton-Pickard Time and Instantaneous and Snapshot Shutters.—First prize, £15, Misses Ella and Agnes Tomlinson, Fishbourne, Chichester; second, £10, A. Durn, The Studio, Long St. Wotton-u.-Edge, Glos. (conjointly with J. Janes, 330, Smith-st., Collingwood, Victoria, Australia); third prize, £5, Mrs. R. M. King, Ascot Hill, Bridgewater; fourth, £3, Capt. F. W. S. Frayer, Madras, India; fifth, £2, W. McLean, 20, Ponsonby-avenue, Belfast.

EXHIBITION OF THE BRIXTON AND CLAPHAM CAMERA CLUB.

THE Tenth Annual Exhibition of the Brixton and Clapham Camera Club was held on Thursday, Friday, and Saturday, the 14th, 15th, and 16th inst., at Brixton Hall, Acre-lane, S.E. Unfortunately climatic conditions were very far from favourable, and the attendance was not what the Society had a right to expect in recompense for the trouble involved in the organization of the Exhibition.

So many photographers who take a leading place in the important exhibitions of the day have started their photographic career as members of this admirable club that one is led to expect greater things of the present members than perhaps one ought, and to feel disappointed that the club Exhibition is not something much above the ordinary. But, although we cannot say the members' portion of the Exhibition contained many examples of the kind to arouse enthusiasm, there was throughout evidence of careful photographic training, and especially in the architecture, which seems to be a particularly popular class of subject with the members; a great many of the pictures were beyond reproach in their technical qualities. We could not resist the impression that timidity was a prevailing characteristic of the members. An unusual proportion, for the present day, of the pictures consisted of direct prints from half-plate negatives, and, although we admit that the size of a picture is not a matter for consideration in estimating its merit as an individual picture, in an exhibition small pictures run a great chance of having their beauties overlooked on account of the close examination necessary. In architecture, particularly, small work is at a disadvantage. It is difficult under the best conditions to give an impression of breadth in a subject which necessarily consists of a multiplication of minute details such as occur in most views of cathedral interiors, and the difficulty is enhanced when the print is so small that it cannot be viewed from sufficiently far to obtain its general effect. We should strongly counsel the members to make more use of the club's enlarging lantern. From an educational point of view, enlarging is an exercise the value of which cannot be overestimated.

The judges were Messrs. J. H. Gear and J. A. Sinclair. For the best collective exhibit they awarded a silver-gilt medal to F. W. Levett, and for the next best collective exhibit a bronze medal to W. E. Dunmore. Mr. Levett's twelve pictures were, with one exception, architectural studies, and very creditable work, the exception, a flower study, was perhaps even a better thing of its kind. Mr. Dunmore's exhibit showed greater variety both in subject and treatment, and, although in some instances his work rose to a higher level, his exhibit contained some injudicious selections. A bronze medal was awarded to F. P. Smith for a landscape subject, a somewhat well-worn theme, but treated with feeling, and indicating some knowledge of pictorial effect. A bronze medal was also awarded to R. Fisher for a river scene.

There were eighteen sets, each of four, lantern slides in competition, and they appeared to us, on the whole, excellent. Both the silver and bronze medals were awarded to F. W. Levett.

In addition to the members' exhibits there was a well-selected loan collection of pictorial work by F. J. Mortimer, C. H. Oakden, A. Bedding, W. R. Rogers, T. Lee Syms, J. B. B. Wellington, C. J. King, T. G. Cartmell, P. R. Salmon, Harold Baker, A. Horsley Hinton, J. H. Gear, J. A. Sinclair, R. B. Lodge, E. Dockree, and the late H. P. Robinson. Andrew Pringle sent lantern slides by the Sanger Shepherd process, and photographs in colour by Dr. Selle's process were also on view. Messrs. R. and J. Beck and R. W. Thomas, Ltd., had exhibits of material and apparatus.

News and Notes.

THE Southsea Exhibition.—Saturday, November 23, is the last day for entries for this Exhibition; November 27, for late entries; and all exhibits must be in by Friday, November 29.

WE are sorry to learn of the death of the well-known amateur photographer, Mr. T. M. Brownrigg aged 78. The deceased gentleman passed away at Arlington House, Guildford, on the 17th inst.

FROM Messrs. C. Ablard and Co., of 32a, Colebrooke-row, Islington, N., we have received specimens of mounts blocked in gold. They are specially offered to professional photographers, and have suitable inscriptions for Christmas and New Year purposes.

"LIGHT from Beef Steak!"—The following appears in an evening contemporary: "New Scientific Discovery. From our own Correspondent. New York, Thursday.—Professor Gorham, of the Bacteriological Department, Brown University, has succeeded in extracting from decayed beefsteak sufficient illumination to take photographs of the laboratory apparatus. The professor seeks to obtain artificial light in which the element of heat is not contained, and believes he is on the right tack."

HOAR Frost Photographs.—The fogs we have had of late, almost throughout the country, have been a serious hindrance to photography generally. But they have, at the same time, afforded opportunities of obtaining photographs that make excellent pictures for the stereoscope or the lantern. Such pictures are only to be had in perfection when the moisture condenses and then freezes on exposed surfaces as hoar frost in fine sparkling crystals, and the sun suddenly breaks out; then they last but a very short time, consequently the pictures must be secured at once or the opportunity will be lost. Photographs of trees, etc., covered with hoar frost, which, if taken under ordinary conditions, would not be worth a plate, make exceedingly fine pictures when shown on the screen, or are viewed in the stereoscope. At the time we write the shrubs and trees in our garden, with the sun upon them, make a glorious picture, uninteresting as they are under normal conditions. Many such pictures may be secured in November, when the sun has yet sufficient power to produce a sparkling effect, which it has not in mid-winter.

USING Collodion on Cows.—In the Northern Division Police Court, at Dublin, on the 7th inst., before Mr. Mahony, Stipendiary Magistrate, a man named Patrick Tyrrell, of North Brunswick-street, Dublin, was prosecuted by Inspector James Richardson, V.S., at the instance of the Dublin Corporation, for having at the Dublin Cattle Market cruelly ill-treated two cows by causing same to become overstocked with milk in consequence of the covering and plugging of the ducts of the udders with collodion, or a substance resembling same. Mr. Ignatius Rice, solicitor, prosecuted for the Corporation. Mr. Richardson, V.S., gave evidence in support of the charge. It was also proved that the defendant had been fined £3 on a previous occasion. Mr. Mahony now sentenced the defendant to be imprisoned for fourteen days, with hard labour. Tyrrell said he was an old man, and could not stand imprisonment. Mr. Mahony said the defendant should have thought of that before he was guilty of such gross cruelty. The sentence had now been delivered, and he would not alter it. He wished it to be publicly known that in future he would send to gaol with hard labour any persons brought before him who were proved to be guilty of using collodion in this way.—"Pharmaceutical Journal."

"WHAT has become of the 'Fittleworth School' in these dark, dank days of November? All last summer the upland lawns overlooking the famous mill bristled with easels, the water-meadows along the Rother bore a mushroom crop of big umbrellas, and the pen made of a swan's feather squeaked and quibbled over the pages of the celebrated inn album. Not one of the countless painters visiting the neighbourhood ever mentioned the existence of a school, but the leaves whispered of it and the waters lisped of it and the air was in a flutter with secret knowledge. Even the ostler had his share of the secret. 'There's a many hartises visitin' here, which means good lets for the farmers' wives,' quoth he, 'but nothin' whatever organized! Beggared if I sees money in the trade when all of 'em, one a'ter another, makes pictors o' the same spot, like a passel o' sheep. Why not have an overseer an' work along differen' tracks? One take off leg an' t'other near leg, like Bill an' me. Hoo!" He to whom the ostler confided his desire of the master's arrival lately visited one of the Fittleworth painters, and after looking at a vast number of sketches—the series would be far more useful than an Ordnance survey map to any foreign general invading Sussex—discreetly approached the subject of the school. 'Certainly!' said the artist. 'There should be a school there! Better than Newlyn? A better location, no doubt. Of course, you can walk both ways there, but at the seaside there's only one way to walk. Twice as good as Newlyn or St. Ives.' Next summer we shall see what we shall see."—"Morning Post."

THE New Star in Perseus.—The following telegram has been received at the Royal Observatory, Greenwich, from the Centralstelle for astronomical telegrams at Kiel:—"From Crossley photographs Perrine finds that four principal condensations faint nebula surrounding Nova Persei moved south-east one minute arc in six weeks.—Kreutz." The photographs alluded to were taken with the Crossley telescope of the Lick Observatory, Mount Hamilton, by Professor Perrine. Photographs taken a little earlier at Heidelberg, by Dr. Max Wolf, and at the Yerkes Observatory, Wisconsin, by Mr. G. W. Ritchey, had shown the Nova to be surrounded by a faint but very complicated and remarkable nebulous structure. The brightest portion of this, and the first discovered, lay to the south of the new star, and it is in this brightest portion that the most astonishing movements have now been observed. Such a rate of motion would carry a body across a part of the sky equal to the diameter of the moon in four years, a motion utterly unparalleled anywhere else amongst stars or nebulæ. The distance of the Nova from the Solar system has not yet been ascertained; but if it be no further from us than Sirius, one of the nearest, as it is by far the brightest, of the stars, an apparent motion of this amount would imply an actual velocity of something like four thousand miles, not per day or per hour, but in every second of time. Either, therefore, the new star is immeasurably closer to us than any body outside the Solar system of which we know at present, or there are movements going on around it which utterly transcend conception.—"Standard," Nov. 13, 1901.

DUNDEE and East of Scotland Photographic Association.—An International Photographic Exhibition will be held in the Victoria Art Galleries, Dundee, opening on Friday, January 31, 1902, and remaining open for four weeks. Entries close Saturday, January 11, 1902. The Judges are: Pictures—Messrs. J. Craig Annan and William Crooke. Lantern Slides and Lecturette—Mr. A. Horsley Hinton. The Exhibition Secretaries are Messrs. V. C. Baird, Broughty Ferry, N.B., and A. Campbell, Barnhill, Broughty Ferry, N.B., to either of whom all communications should be addressed. The Classes are:—Open—1, Champion. (Any subject); 2, landscape or seascape; 3, Architecture—interior or exterior; 4, flowers or fruit; 5, lantern slides, set of four; 6, animal studies. The medals in Class 6 are the gift of the proprietors of the "Evening Post," Dundee. Professional—7, portraiture. Amateurs—8, landscape or seascape; 9, figure study. Members of the Association—10, landscape or seascape; 11, figure study; 12, enlargements. Special Class—13, landscape or seascape (with or without figures). Confined to amateurs resident in the counties of Forfar, Fife, and Perth. The medals are the gift of the proprietors of the "Evening Telegraph," Dundee. Lecturette—14, lecturette (open), illustrated by not less than 20 lantern slides. 1st prize, £2 2s.; 2nd prize, £1 1s. Lecturettes and slides will be returned to the competitors at the close of the exhibition. Trade—15, apparatus and general trade exhibits. Wall or table space, 1s. per square foot. One gold medal will be at the disposal of the Judges in Class 1, one silver medal in Class 15, and one silver and one bronze medal in each of the following Classes:—2, 3, 4, 5, 6, 7, 8, 9, 10; 11, 12 and 13. A novelty is to be tried in the shape of a "Photographic Art Union," for the purpose of inducing sales at the exhibition. Dundee has long held a reputation as an art-buying centre, and the committee anticipate that on this occasion a record will be made, so far as the provinces are concerned, at least.

PHOTOGRAPHY on "The Cruise of the Ophir" and "Our Navy."—With the return of Mr. T. McGregor, the official photographer who accompanied the Duke and Duchess of York on their tour in the Colonies, an enormous amount of photographic work, recording many of its events, will become available for the information and interest of the public, that gentleman being now associated with Mr. Alfred West, the well-known marine photographer and organizer of the successful cinematographic entertainment, "Our Navy," to which latter the "Ophir" series of pictures have now been added by special permission. Since the return of the vessel Mr. West and his staff have been very busy at the "Anchorage," Southsea, developing and printing from the three-quarters of a mile of film and the thousand plates exposed during the voyage, and on Friday, the 8th inst., having reported progress to the Prince of Wales, Mr. West received a command to show some of the results before His Majesty the King, on the occasion of his birthday celebration at Sandringham on Saturday, the 9th. In the pictorial, as in the real Navy, they are nothing if not smart, and well before the appointed time everything was in readiness in the Ball Room, and at ten o'clock a most successful show was given before the King and Queen, the Prince and Princess of Wales, Princess Victoria, the Grand Duke Michael, and many other distinguished personages. The Prince and Princess apparently much enjoyed the two hours' recapitulation of their recent tour, and their Majesties showed much interest in the various events depicted, the applause being hearty and frequent as the various animated and still pictures were thrown upon the screen, and the King afterwards personally congratulated Mr. West on the excellence of the exhibition. The same verdict was also expressed by those present at the private view at the Polytechnic on Saturday afternoon, which consisted of the new edition of "Our Navy," prepared for the coming season, and as many of the "Ophir" pictures as are at present available for exhibition. Towards the end of the show some of the effects were marred by the dense fog which by that time had begun to penetrate into the hall, but the views themselves were most successful, both from the popular and photographic point of view, especially when it is remembered that most of them were taken under great difficulties as to the obtaining of good points of view, good weather, and good lighting, the former being not always easy to obtain by a photographer travelling with the Royal party, and so not able to make complete arrangements beforehand. Perhaps the most popular of the animated photographs is that of the Royal train emerging from a tunnel in the Rocky Mountains, with the Duke of York riding on the cow-catcher, and waving his hand as the train passes the camera; while one of the photographically best is that of "Heaving the Lead," in a heavy sea during the homeward voyage, which is a very fully exposed film, and which works with an almost complete absence of flicker.

LESSONS from Germany.—We are glad to see that many public men are directing attention to the relationship between scientific investigation and industrial progress, and urging reforms which were advocated in these columns, and by men of science generally, long before the present position was reached. There is no question now that resolute efforts must be made if Great Britain is to hold her own during the twentieth century. Already we have lost supremacy in several branches of industry, and we shall probably be surpassed in others by America and Germany unless our commercial men learn to realise that science is the source of energy of all sustained industrial movements. It is the business of scientific research to extend natural knowledge, and the investigator is not usually concerned with the commercial aspects of his work. The application of scientific results to industrial developments is for the manufacturer and merchant to consider, but they are unable to appreciate the possibilities of such results unless they have themselves had a scientific education. A discovery which to one man appears trivial may be made by another the nucleus of a great industrial development. Commercial history can afford numerous instances of the connection between science and prescience and the influence which the two combined exert upon progress. Mr. R. B. Haldane, M.P., mentions a few cases of this kind in an article in the November number of the "Monthly Review." He selects the brewing industry as one instance of a change which should cause national concern. Thirty years ago Germany exported no beer, to-day she exports almost as much as Britain. The advance is due to the discovery and application of scientific method. When the "Brauerbund" was formed, it was definitely decided to make science with practice and practice with science the principle to work upon. Scientific stations were established in which technical problems confronting the practical brewer could be studied, brewing schools were founded, each with laboratories, experimental maltings and a brewery attached to them, and every effort was made to provide for the education of brewers with scientific as well as technical knowledge. The result of this thorough provision for educating scientific brewers is that German beer is a very active rival of English beers in our own country, and in France it almost monopolises the market. This is one example given by Mr. Haldane to show how the industrial life in Germany is in close contact with the academic life. The case of the aniline dyes is too well known to need to be described here again, but our loss may be understood by the fact that 80 per cent. of the coal-tar colours used by the Bradford Dyers' Association now comes from Germany. It is, however, not only through the school that the man of science in Germany comes to the aid of industry, but also through the experimental stations or central bureaus of scientific opinion. The German, remarks Mr. Haldane, "is aware of the enormous extent to which he is dependent upon high science, and, further, that the best high science cannot be bought by the private firm or company. Accordingly the rival German explosives manufacturers several years ago combined to subscribe about £100,000, and to found close to Berlin what they call their Central-Stelle. This establishment, which is maintained by subscription at a cost of about £12,000 a year, is presided over by one of the most distinguished professors of chemistry in the University of that city, with a staff of highly-trained assistants. To it are referred as they arise the problems (in this industry these abound) by which the subscribers in their individual work are confronted. By it is carried on a regular system of research in the field of production of explosives, the fruits of which are communicated to the subscribers." Compare this organized system of determining the best methods and processes with the narrow spirit in which most of our commercial work is carried on. Trade rivalry exists in Germany as much as here, but it does not prevent combination having for its object the scientific study of subjects related to industries and manufactures. The universities, technical schools, and other academic institutions are all part of an organized system, and though the aim is culture, the application of the highest knowledge to commercial enterprise is borne in mind, and everything is done to encourage it. It is not necessary for us to copy Germany in everything, but we need more of the spirit which has built up such a splendid system

of study and brought science, education, and industry into such close relationship. It is the duty of the State to do far more than it has hitherto done to promote this connection by assisting research, organizing and extending scientific education, and encouraging men to devote their lives to the extension of natural knowledge.—"Nature."

Commercial & Legal Intelligence.

THE Austin-Edwards' Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. H. G. M. Conybeare, Delmore, Ingatestone, for his negative "Market at Luxemburg."

FOX, Limited.—This Company has been registered by White and De Buriatte, of 38, Holborn-viaduct, E.C., with a capital of £500, in £1 shares, of which 400 are preference shares. The objects of the Company are to carry on the business of opticians, and manufacturers, and dealers in optical, photographic, and philosophical instruments and appliances, and dealers in scientific books and literature. There will be no initial public issue. Registered without articles of association.

H. O. DRAKE, Limited.—This company has been registered by E. H. Sturge, of 18, Ashwin-street, Dalston-junction, with a capital of £1500, in £1 shares. The objects of the Company are to carry on, in all or any of their respective branches, the businesses of dealers in photographic and optical materials, artists' colours and materials, and fancy articles generally. There will be no initial public issue. The first directors are: C. J. Wild, F. E. Butcher, and H. O. Drake. No qualification specified. Remuneration (maximum), £250 per annum, divisible.

ESME Collings, Limited.—The above-named company has been registered by Miller and Co., of 3, Salters-hall-court, with a capital of £20,000, in £1 shares. The objects of the Company are, to acquire the business carried on in London, Brighton, and Liverpool, as Esme Collings, and to carry on the business of photographers, miniature portrait painters, printers, art publishers, manufacturers of, and dealers in, photo materials, proprietors of art and photo clubs, etc. Minimum cash subscription, 7000 shares. The first directors, to number not less than three, nor more than five, are: Sir C. G. Walpole, C. B. Fry, A. A. Collings, R. B. Hope, and C. E. Lyon. Qualification, £500. Remuneration, £40 per annum each.

MR. REDMOND BARRETT, F.R.P.S., writes from 117, The Grove, Hammersmith, W.:—"I beg to announce that I have taken more extensive premises at this address and will now be able to carry out all orders with the minimum of delay, and under my personal supervision. My special attention will continue to be given to private and class instruction in the art of retouching, including portraiture, landscape, architecture, etc. I am now prepared to receive commissions for the restoration and photographic reproduction of miniatures and family portraits, engravings, works of art, and also the artistic mounting and framing of same. A new feature I am introducing is the designing of book plates, head and tail pieces, etc., for all kinds of illustrated books, and artistic scroll work generally. I am giving most careful attention to the developing and printing of amateurs' negatives. I take this opportunity of thanking my many friends and patrons for the kind support I have received from them for more than a quarter of a century, and hope the resources now at my command will enable me to merit the continuance of their esteemed favours."

At Greenwich Police Court last week George Hypolite Le Bluff, greenhouse builder, of Ladywell-road, Lewisham, was charged, on remand, with obtaining money by false pretences. At the previous hearings of the case, evidence was given by a number of witnesses that they had sent orders for greenhouses, etc., together with cheques, and had not received what they ordered from prisoner, who traded as the Straightsmouth Portable Building Company, the advertisements which led to the orders being sometimes in the name of Mitchell. Mr. Rowe now appeared for the Public Prosecutor, and Mr. Llewellyn Davies defended. Isaac John Salter, shoemaker, London-street, Greenwich, spoke to Mitchell dealing with him and telling him he was interested in the business at Straightsmouth. Patrick Macarthy, Assistant Bailiff at Greenwich County Court, produced the file of proceedings in bankruptcy against prisoner in September, 1900. His liabilities were £813 17s. 1d., and assets £3 17s. 1d. Most of the liabilities were for cash sent for goods which were not supplied. The bankrupt had not received his discharge. There had been nine summonses against him in the Greenwich Police Court since he had been at Straightsmouth. Prisoner had, before his bankruptcy, carried on business at Trundley's-road, Deptford, where he had a large stock and plant. Prisoner was remanded, the bail being enlarged.—"Standard," November 18, 1901.

ILFORD, LTD.—The directors' report for the year ended October 31, 1901, states that after payment of working expenses, directors' fees, income-tax, etc., and making provision for doubtful debts, the net profit for the year's trading is £53,725 1s. 1d. This amount, with £2665 7s. 7d. brought forward from last year, gives £56,390 8s. 8d. for appropriation. The directors have paid an interim dividend on the ordinary share capital for the half-year ended April 30, 1901, at the rate of 8 per cent. per annum, free of income-tax, absorbing £7600, and for the same period they have paid the dividend on the Six per Cent. Preference Shares, amounting to £5700. Since then the second dividend on the Six per Cent. Preference shares has been paid. From the balance the directors recommend that on the Ordinary share capital a dividend be paid for the half-year ended October 31, 1901, at the rate of 12 per cent. per annum, and in addition a bonus of 2½ per cent., making, with the above interim dividend, a distribution of 12½ per cent. for the year. This will absorb £16,150. On the profit-sharing scheme, £821 2s. 5d., more or less, will be paid as bonus to the employees. Of the balance, £20,419 6s. 3d., the directors recommend that £8000 be written off goodwill, processes, etc., that £8000 be placed to reserve, and the balance, £4419 6s. 3d., carried forward. The business continues to show satisfactory progress, and, notwithstanding the increased competition in the trade, the sales have been considerably larger than in any previous year.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
25	Camera Club	*Hammered Metal Work.* Messrs. W. Höfler and H. L. Ashford.
25	Croydon Microscopical	Mr. Rudler's Eighth University Extension Lecture.
25	Southampton	*Improving Negatives and Prints, Pictorial and Decorative Work.* W. D. Welford, F.R.P.S.
26	Birmingham Photo. Society	Demonstration: *Development of Negatives by the Use of Ten-per-cent. Pyro-Soda Developer.* P. T. Deakin.
26	Leeds Photo. Society	Demonstration: *Ceramic Photography.* Philip Elliff.
26	Newcastle-on-Tyne	*Chromatic Photography.* A. Payne, F.C.S.
26	Stonehouse	Nomination of Officers.
27	Borough Polytechnic	An Evening with R. Child Bayley, F.R.P.S.
27	Croydon Camera Club	*My Experiences with Amateur Cinematography.* Hector Maclean, F.R.P.S.
27	Photographic Club	*Through Boer Land in a Bullock Waggon.* L. Medland.
27	Southsea	*Bromide Enlarging by Artificial Light without a Condenser.* F. J. Mortimer.
28	Camera Club	*Divers and Diving Operations.* T. C. Hepworth.
28	Darwen	*Architectural Photography.* J. H. Avery.
28	Liverpool Amateur	Lantern Lecture: *Cities and Sights of Spain.* Mrs. Le Blond.
28	London and Provincial	Paper by T. K. Grant.
28	North-west London	*Architectural Photography for Beginners.* C. H. Oakden, F.R.P.S.
28	Richmond	*The Optical Lantern and its Manipulation.* Mr. Alabaster.
29	Borough Polytechnic	Instruction Evening: *Enlarged Negatives.* F. W. Bannister.
29	Croydon Microscopical	Photographic Conversational Meeting.
29	Bognor	Demonstration: *Mariona "Gros Grain" Paper.* Miss Simpson.

ROYAL PHOTOGRAPHIC SOCIETY.

ORDINARY Meeting, November 12,—Major-General J. Waterhouse, I.S.C. (Vice-President). in the chair.

NEW MEMBERS.

Nominations in favour of 18 candidates were read, and 30 candidates whose names were read at the last ordinary meeting were balloted for and duly elected.

AFFILIATION.

The following Societies, it was announced, had been admitted to affiliation:—Aldershot and District Camera Club, Northern Tasmanian Camera Club, Northampton Natural History and Field Club.

The following presents from Dr. P. H. Emerson were acknowledged with thanks:—Life and Landscape on the Norfolk Broads; Pictures of East Anglian Life.

The Chairman announced that Mr. Douglas English, who was to have read a paper upon "Photography as an Aid to the Naturalist," had wired to say that a very severe cold confined him to the house, but that he was sending the lecture to be read. Unfortunately the paper had not arrived, but the slides that were to illustrate the lecture were in the Secretary's hands, and would be shown.

The Assistant Secretary thereupon showed the slides upon the screen, and, with the assistance of Mr. T .E. Freshwater, described the photographs, which were of a great variety of creatures—toads, frogs, snakes, newts, rats, mice, butterflies and caterpillars, cats and the feathered tribes. Mr. Freshwater answered a number of questions on subjects connected with the lecture, with which he was conversant. The paper will be printed in the Society's "Journal."

THE first lantern meeting of the present session was held at 66, Russell-square, on Tuesday, November 19,—Mr. J. J. Vezey, F.R.M.S., in the chair.

Mr. J. W. Groves lectured before a large and appreciative audience upon the subject of "Japan, as illustrated by Herself." Mr. Groves has travelled considerably, and has visited, amongst other countries, that very go-ahead country, Japan. That he made excellent use of his opportunities

is a fact one only requires to hear him to be well assured of. Additional interest attached to the lecture because Mr. Groves permitted the Japanese themselves to portray their country—the negatives, slides, and the often exquisite colouring being largely the work of native artists. That the Japanese have thoroughly mastered the technical and commercial applications of photography was amply demonstrated. On the walls of the rooms were hung a score or more of collotype prints from negatives by Mr. Groves in Kashmir. They had no direct bearing upon Japan except that the collotypes were by Mr. K. Ogawa, of Tokio, a Fellow of the Royal Photographic Society, who has a very far-reaching reputation in the East for his photographic work. The views were of that variety that they could not fail to impart to all who listened an excellent idea of Japanese private life and customs. The semi-religious tea party, a function that seems contradictory to our Western notions altogether, was described as an affair at which any idea of chat or exchange of views was strictly improper, while another rude shock was caused by the statement that "tea" was a decoction from leaves of any kind, and not necessarily to be associated with the plant that is at the bottom of that important national social event in England—afternoon tea. Another curious custom is the birthday celebrations. Here, in England, our birthdays are occurring every day, but in Japan the fair sex have a fixed day in the year for these particular rejoicings, no matter when the actual anniversary comes round, and the male members of the community another fixed day for their celebrations. The idea has many recommendations that may call forth the sympathies of those of us who are of riper years. Etiquette amongst the Japanese appears to be a somewhat involved affair. A number of pictures were introduced to show the formalities one must observe in meeting and leaving one's friends. Mr. Groves had a good deal to say about the Japanese ladies' apparel, with their wonderful and capacious sleeve pockets, their method of dressing the hair, and so forth, all of which seemed to deeply interest the ladies of the audience. Turning to outdoor life, some interesting pictures of agricultural pursuits and implements were shown, from the primitive method of irrigating the soil to the as primitive means of grinding and winnowing the corn. The religious aspect of Japanese life was also dealt with, and portraits of Shinto and other priests served to make clearer to the hitherto uninitiated the workings of the Japanese mind. Dancers, wrestlers, Geisha girls, and innumerable groups and figure studies brought out one or other of the many phases of life, and the very fine photographs of landscapes, Buddhist temples, native houses and types, etc., all contributed to evoke a hearty demonstration of approval from the pleased and, doubtless, instructed audience.

The next lantern lecture will be on Tuesday, December 10, when Mr. J. J. Vezey will give a lecture on "The Chateaux of Mediæval France." This lecture will be illustrated by slides from Commander C. E. Gladstone's photographs.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 14,—Mr. J. T. French in the chair.

Mr. John A. Randall read a paper on

The Problem of Actinometry.

The author remarked that one could not go very deeply into photographic matters without facing this problem of actinometry, and that if any advance had of late been made it was in the study of this important problem, and of development. The term actinometry was now being found too narrow in its scope to cover all the phenomena that properly come within the study. An actinometer, he understood, as something more than a graduated scale. The actinometer that was useful in carbon work was an actinometer only in a limited sense, and touched but the fringe of the subject. He thought that the common form of actinometer, although certainly useful in many ways, was not in the best form. He showed an improved model, which preserved the prints as standards for comparison, whereas in the old form the paper was drawn out as it received the impressions, and a full use was not made of its work. Mr. Randall said that the essentials of a perfect actinometer were that the results should be quantitative, the observations continuous, and the instrument self-recording. The Bunsen and Roscoe actinometer was described. It was an elaborate piece of apparatus, but its utility was limited, as only the violet, ultra-violet, and indigo affected it. It depended upon the combination of hydrogen and chlorine when the mixed gases are exposed to light. The results were unreliable, however, and the method was abandoned. Mr. Randall showed a form of clockwork actinometer in which a drum, bearing sensitised paper, revolves once in twelve hours under a 1 to 400 scale, and in which the extent of the colouring is a measure of the strength of the light prevailing at a given time. A number of records made in this instrument were shown, and it was seen that for different days they showed a great variation of light power. From the daily records thus made was produced a curve for the months February, March, and April, showing a gradual rise in the actinic power of the light as the sun got higher and higher. This apparatus fulfilled two of the requirements laid down—it gave a continuous record, and was self-recording, but the results were not quantitative, although very useful data, and a lot of information upon which exposure tables were based was afforded. It showed that the light of the morning hours was far more actinic than the others, that certain morning and afternoon hours were often very erroneously coupled as equivalent in exposure tables, and, further, that bright days may be actinometrically dull and vice versa. It was an instrument that should play a great part as the reliable test and advocate of a health resort. The silver chloride paper that was used in the actinometer was, however, sensitive to but a narrow region of the spectrum, and liable to introduce discrepancies due to the difficulty of reading the tints, etc. He had substituted gelatino-bromide films, reading the records after development in a photometer, but, although the accuracy of such records would be better, he abandoned the idea because of the expense and labour involved. Mr. Randall then dealt with the Hurter and Driffield actinometer, and showed a rough drawing. It consisted of two glass bulbs, partially exhausted, one a colourless and one a flashed red glass. To these was connected a syphon gauge, which was actuated by the light falling upon the bulbs, and the extent of the movement of the gauge was recorded on a revolving drum. The method could be made sensitive to all radiations by use of different solutions in the instrument. Upon this the actinograph was based. The method fulfilled the three conditions, and was an excellent arrangement. Electrical developments opened up a still larger field in actinometric study, and in this connection an apparatus was shown that was likely to prove very valuable in the future. Two oxidised copper plates, with their terminals connected with a galvanometer, are inserted in a glass vessel containing pure water or a solution of one of a variety of salts. Light falling upon this battery produces a current that influences the needle, and, by means of a source of light reflected upon the mirror of the galvanometer, and thence to a revolving drum, a record of the light intensity or actinic value is preserved. The use of different dyes on the copper plates renders the battery sensitive to all rays, and the actinometer that this device became was a very promising one. It was a difficult thing to keep the dye upon the copper plates in the water or solution. If one used dye solutions one would have to allow for the light stopped by the solution. The life of the battery was practically that of the oxide. In reply to a number of questions, Mr. Randall said that red glass was used in the Hurter and Driffield actinometer so as to exclude the rays of no photographic action, and so that only the more active rays could be measured. The instruments were examined with much interest.

PHOTOGRAPHIC CLUB.

Annual General Meeting, November 6,—Mr. F. A. Bridge in the chair.

The Hon. Secretary submitted the balance-sheet for the past twelve months, showing that on the year's working there was a balance of a few pounds. Certain items, however, on the payment side, strictly speaking, belonged to previous years, and their payment during the year just completed had the effect of somewhat reducing the balance that should have been carried forward. The few liabilities were practically met by assets, comprising certain outstanding subscriptions. The balance-sheet, duly audited, was adopted.

The Hon. Secretary read the annual report, in which the year's proceedings were detailed, and the Club's position and prospects discussed. The report was adopted after a short discussion.

The following were elected the officers and committee for the ensuing year:—Trustees, F. A. Bridge and H. Snowden Ward; Curator and Librarian, Hans Müller; Secretary and Treasurer, E. A. Newell; Committee, G. E. Brown, A. Mackie, J. W. Mason, W. R. Stretton, H. P. Smith, G. Wynne, Charles Wallis, and J. W. Zähnsdorf.

A vote of thanks was passed to the officers, the scrutineers, and the auditors for their labours.

Mr. Mackie moved that to Mr. Haes, the retiring Trustee, be addressed a letter expressing the Club's deep gratitude for his lengthy services, and sympathising with him in the increasing infirmities that made it impossible for him to continue in office.

Mr. Zähnsdorf seconded the vote, and undertook to engross on vellum any words that might be decided upon.

The motion was unanimously agreed upon, and Mr. Zähnsdorf was cordially thanked for his kind offer.

The meeting next proceeded to the consideration of a proposed alteration of Rule xiii., providing for the reduction of the annual subscription to half a guinea.

Mr. Bridge formally moved the resolution, which was seconded by Mr. H. P. Smith. A long discussion took place, and the resolution was finally adopted.

Woolwich Photographic Society.—November 16, 1901.—Mr. Douglas English, B.A., gave a lecture to the members of this Society on "Natural History Photography." The lecture was profusely illustrated with many beautiful slides. The attendance was about 70. The next meeting will take place on Thursday, the 28th inst., when Mr. W. F. Slater, F.R.P.S., will deliver a lecture on "A Trip up the Rhine with the South London Photographic Society." Tickets for the lecture may be obtained from the Hon. Secretary.

Leeds Photographic Society.—On Tuesday, November 12, Mr. C. B. Howdill, A.R.I.B.A., addressed the Society on "The Photography of Colour." Although the weather was very stormy a fairly large audience assembled at the Philosophical Hall, being attracted by the subject. The theory of light and colour was first entered into, and then the Joly system of colour photography was described, and at the same time illustrated with diagram slides. The practical application was shown by means of slides taken by Mr. Howdill of decorative designs, stained glass, and one or two pleasing examples of landscapes. The Sanger Shepherd system of tri-colour slides was very clearly placed before the members, the effects of the three systems on the projected slides being well

demonstrated, showing the manner in which the rays not required for each particular negative are cut off. A large number of slides were exhibited of a variety of subjects, including those prepared by the lecturer and lately shown at the New Gallery. Special attention was drawn to "Jonah and the Whale." The possibilities of landscape work were well brought out by exteriors of York and Ripon Cathedrals. A cordial vote of thanks was proposed by Mr. Walker, and seconded by Mr. Godfrey Bingley, who commented on the hard work Mr. Howdill had done during the Convention week at Oxford. Mr. Washington Teasdale supported the resolution, and remarked on the lucid manner in which the processes had been described.

Liverpool Amateur Photographic Association.—November 16, 1901.—At the last weekly meeting a lecture was delivered by Mr. W. Edwin Tindall, R.B.A., on "Composition and Tone Values." Mr. Tindall, who spoke for upwards of three hours, after explaining the various lines of beauty used in the composition of a picture, proceeded to make several chalk and charcoal sketches based on the various lines which vividly illustrated his meaning. Dealing with the subject of "Tone Values," by the aid of photographs of many paintings by the world's greatest masters, which were thrown on the screen in contrast to some of the work of the Association, the relative values were easily distinguished, and, in criticising the amateurs' work, from a strictly artistic point of view, Mr. Tindall kept his audience in a high state of merriment. Of course, his ideals are in many cases impracticable to the ordinary photographer, but nevertheless, adhering to the lines set down, a careful study of the subject would result in a more artistic production.

Southsea Photographic Society.—November 12, 1901.—A demonstration was given before the members of this Society on "Röntgen Ray Photography" by Mr. A. Debenham. The lecturer has long been a practical utiliser of this wonderful discovery, and his lecture showed that he was thoroughly at home with his subject. His apparatus was of the latest kind, and very portable, and during his demonstration he made two excellent radiographs of the hands of the President (Dr. Newby). He also showed the living moving bones of the hands and arms of other members of the Society in the fluorescent screen, and exhibited a fine series of lantern slides of radiographs.

FORTHCOMING EXHIBITIONS.

1901.	
November 23–30	Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.
December 3–7	Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.
Dec. 20–Mar. 1902 ...	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.
„ 24–Jan. 4, 1902	Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.
1902.	
February 13–15	Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries: W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell Hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.
„ 15–Mar. 8	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
„ 19–26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.

Patent News.

The following applications for Patents were made between November 4 and November 9, 1901:—

Apparatus.—No. 22,177. "Improvements in and relating to Photographic Apparatus." Christian Gustav Warnecke and William Henry Heath.

Shutters.—No. 22,207. "Improvements in Shutters for Photographic Cameras." Walter Griffiths and Frederick William Rushbroke.

Albums.—No. 22,311. "Improvements in or relating to Stamps and Stamp Cards or Display Sheets or Albums, Photographs, Scrap-book Pictures, and Scrap Books and Albums therefor." Thomas Macready Down and Joseph Alexander Kerr.

Cinematographs for Natural Colour Photographs.—No. 22,390. "Improvements in Cinematograph Apparatus for production of Pictures in Natural Colours." William Norman Lascelles Davidson.

Printing Frame and Retouching Desk.—No. 22,448. "Improvements in a Combined Apparatus serving the Double Purpose of a Photographic Printing Frame and Retouching Desk." Harold Edward Brightman.

Rockers.—No. 22,450. "Improvements in Apparatus for Rocking Photographic Negatives and Prints during Treatment in Developing, Toning, and Fixing or other Solutions." Wilfrid Clifford-Smith.

Rockers.—No. 22,463. "Improvements in or relating to Rockers for Rocking Photographic Plates during Developing." Harry William Charles Cox.

Plate Washer and Drier.—No. 22,578. "A Separable Wire Frame for Use in Washing and Drying Photographic Glass Plates." Complete specification. Ernst Richter.

Camera and Stereoscope.—No. 22,646. "An Improved Photographic Camera and Stereoscope." Léon Bloch.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PRESENT POSITION OF PROFESSIONAL PHOTOGRAPHERS.

To the Editors.

Gentlemen,—Will you allow me space in your Journal to thank Mr. Farmer for the many up-to-date suggestions contained in his lecture to photographers. These hints should prove particularly useful to the enterprising man who has yet to become known to the public. The majority rarely see good in anything until it has become ancient history, and only adopt it themselves when stale and unprofitable. I am afraid we shall never learn the American smartness in "pushing a claim." Firstly, with reference to the bromide proofs at time of sitting, this plan would, of course, not apply indiscriminately to all photographers. For instance, it would be useless to offer this unassuming print to those clients who come long distances especially for collodion enamels, coupled with a particular lighting; but photographers who draw their sitters from the lower-middle classes would probably find the proof "while you wait" a great attraction, and also a good advertisement.

Now, may I raise this question? Why is the furniture emporium scheme lowering to the dignity of photography? Millais allowed a picture of his to be bought for the purpose of advertising soap, whilst many paintings by our living artists advertise perfume, milk, etc. Are photographers superior to artists? Surely not. We are, rather, humble followers of the great masters—unashamed to follow where they lead. Suppose a man were unable to start a first-class business of his own, it would be better for him to make a good connection for himself than spread the fame of his chief, as he would if operating at a firm of photographers.

My second point is—The lady photographer. Many object to her strongly. Undoubtedly she is coming into fashion, especially for children, and perhaps with some of us the fear of being "cut out" by her has a little to do with our objection. If so, we must take extra care only to send out the best work that is possible, and always be up-to-date. We shall find that the best work will always undoubtedly tell in the long run, independently of fashion or sex. In cases of women, generally speaking, only those who have a love of, and often a training, in art, and more or less ability for photography, attempt to take it up professionally; whereas in many cases men are photographers from force of circumstances, having been apprenticed to the trade from boyhood, and worked their way up to being operators or masters. This last-mentioned training, though an advantage in many ways, has one great drawback—the art and composition of picture-making is entirely left out.

In conclusion, I feel sure that we are all, men and women, one at heart in the desire for the welfare and honour of our profession. Some may differ in their ideas and methods of procedure, but, surely, slashing at each other through the medium of print is more lowering to our dignity than the furniture emporium, bromide print, or any other scheme, however humble. We should all do well to carry out the injunction to "Be courteous."—I am, yours, &c.,

Bromide and Bassinette.

THE DISCOUNT QUESTION.

To the EDITORS.

GENTLEMEN,—The article you quote from "A Correspondent" is the most plausible and suggestive that has yet appeared in the JOURNAL in favour of the dealer. But, apart from its sheer plausibility and suggestiveness, there is no convincing argument. Take the first assertion: "The fact that any person largely consumes any manufactured article cannot possibly entitle him to a distributor's profit." Why not? Let the manufacturers fix their discounts according to the amplitude of the order, and treat every one alike, absolutely fairly all round, be he dealer, professional, or amateur. The distributors' functions, as set forth by your correspondent, are all very well, and they are needful to very small consumers, by giving credit and supplying small quantities from stock. But why should the large consumer who is willing to pay cash be handicapped simply because he is a professional and not a dealer?

Is it "fallacious to assume that a distributor's functions is merely to transmit orders received from consumers" when there are hundreds of dealers who transmit orders for goods to producers, and take no responsibility in keeping a stock? It simply amounts to this: That the large consumer prefers to do away with the intermediary of a superfluous middleman—as every large consumer should do—as a matter of business economy, and a morally legitimate economy is bound to accrue to the good of every large consumer. Your correspondent says, "The attack on the retailer, notably the chemist, is ill considered," and why? "Because the chemist or retailer works on a smaller margin of profit, etc." Now, how can a full trade discount allowed to the professional photographer affect the chemist with whom he does not deal, and who makes his profit from sales to amateurs? The only one affected, and that not to a large extent, if at all, is the middleman, and then only on the two or three articles, the professional can, and does order in large quantities, and for which he therefore expects to get the best terms possible.

All manufacturers endeavour to get their raw materials, or their equivalent, on the best terms. Some products are raw materials in the professional's hands, and it is only reasonable to find him trying to get as good discounts for these goods as others get. As for the assertion, "This agitation will lead to the public refusing to pay producers' prices," this is "fallacious," if you like, and a very weak conception of the temper of the buying public. The public will always pay a good price for a good article when it wants it; and if it can get a good article at a moderate price it will buy it. There is always a demand for high-class goods, and cheap goods, and all the agitation we can make will not alter either demand or supply.—Yours, &c.,

FETTERED LANCE.

November 15, 1901.

To the EDITORS.

GENTLEMEN,—I am unable to follow "One of the First Hundred M.P.P.A." through the list of trades given in his letter in your issue of the 15th inst., because I know nothing about some of the branches of business mentioned, but I will attempt to deal with one or two. Plate-makers, paper-makers, and camera-makers are among the largest wholesale purchasers of the goods referred to, so that there is no approach to a comparison between these manufacturers and retailers or professional photographers. The fact that photographers are producers as well as consumers is fully recognised in the discounts they receive from producers and distributors.

The joiner, unless he be in an exceptionally large way of business, does pay more for his nails than the smallware dealer—in many cases he buys his nails from the smallware dealer in the same way that the professional photographer buys his goods from the dealer. Of course, the printer, who is a printer only, and not a printer and stationer, pays more for his paper than the stationer. Yes, the dyer does pay more for his dye than the drysalter who buys it in quantities from the producers and sells it to the dyer. It is a matter of common knowledge that tailors and milliners pay far more for cottons and ribbons than is paid by the dealers from whom they generally buy. Fashionable tailors and milliners would consider it a waste of time to haggle over discounts on buttons and ribbons; they make their profits on their skill. What is the value of the materials in a fashionable bonnet or a well-made coat? What proportion does the value of the material in an art-photograph bear to its value for sale? I do not know why 15 per cent. has been fixed upon as the difference in prices in each case, but this must certainly vary with regard to such articles as ribbons and hops. Chemists do not deal largely in hops, but brewers often buy their hops of the merchant, and not of the grower, and they do not expect the merchant to work for nothing.

I hope that "J. F. T." does not seriously wish to see "cut prices" introduced into the photographic trade. Even admitting that it might "not matter to the maker what is done with his plates after he is paid for them" (it is not from this point of view that the British dry plate industry has been built up), surely a maker of an article is free to refuse to allow distributors' discounts to a dealer unless the dealer agrees not to sell such articles for less than the maker himself charges for them. If this is not so, what becomes of the maker's undoubted right to carry on his own business? The "dealers' discount" referred to by Mr. A. H. Fry is the discount allowed by all plate and paper-makers to distributors of their manufactures.—I am, yours, &c.,

YOUR CORRESPONDENT.

To the EDITORS.

GENTLEMEN,—I am another who has been very much interested in the above correspondence which has been going on for some time in your columns. Having given the subject careful consideration, and looking at the question from a fair standpoint, I do not understand how it can be hard on the dealer any more than it is on the grocer who retails flour. No one would say a baker who produces the bread should purchase his flour from the grocer, and no grocer finds fault with him for buying direct from the mills. The grocer has many articles for sale; so has the photographic dealer; but the photographer being the producer, has the same right of purchase as the grocer. My district has a population of over ten thousand, and a good distance from the city, and a local chemist, who retails patent medicines, bird sand and seed, pipes, tobacco, confectionery, etc., can buy his plates and papers from the maker at a very large discount, and I will use more material in two weeks than what he can dispose of in six months, and yet I am deprived of the discount because I am not a dealer. It is certainly unfair to the profession. I am quite pleased to learn that the Professional Association is receiving so much support, and that some of the producing companies will waken up some morning before long to find that they have made a very grave mistake.—I am, yours, &c., PROFESSIONAL.

To the EDITORS.

GENTLEMEN,—Very much has been written re discounts to professionals that I hardly like occupying your valuable space on the subject. The whole grievance really rests on the fact that one man in a town, or more, are allowed dealers' discounts, while others, simply because they are professional photographers, are not.

It is very possible that in some large towns there are professionals who prefer not to be bothered with attending to the wants of amateurs, such are not likely to complain, but, taking the average of photographers, is it not a fact that they are obliged to join to their photo department some other, such as stationery, fancy goods, picture-framing, etc., for the simple reason that they cannot obtain sufficient custom in the smaller towns to make a decent living on photography per se, and so such men naturally say, as amateurs come to me to develop their plates and films, why should I not cultivate this by keeping as much stock as I can to meet their wants, on the same lines as I do those who want stationery or cigars? So the next time his wholesale factor, per traveller, comes round, he expresses his views, and he replies, "I should be very glad to supply you, but you must get put on the list of dealers by the P.P.M.A." "Oh, that is it? Why is that?" "Because you are a professional." "Well, what does it mean?" "That you must send us up an order, say, for £20 worth of various plates, papers, etc., such as amateurs use, and we will then submit your name to the P.P.M.A." "I see; and suppose I happen to omit ordering any of the various makes, I suppose I can reckon on their voting against me?" "I cannot say. You see, being only factors, we cannot attend their meetings, and so only know the result." "But there is a chemist round the corner who has recently taken up the sale of photo materials. I called there one day for some whole-plates, but he was out of them (probably never had any). I asked then for some half-plates of a well-known make. 'No, he was sorry he hadn't any in stock.' Was it necessary for him to order £20 worth to get on the list?" "Oh, no; he orders from his chemists' factor just what he wants, and gets dealers' terms, because he is a chemist." "Ah, I thought as much, for I concluded the whole value of his photo stock could be bought for £5 (note, perhaps £3)." Then I ask, "Why on earth do you photo factors agree to be fettered in your business in this way? If I cannot increase my orders through you by cultivating a new departure, why cannot you supply like the chemists' factor? What difference can it make to the makers so long as the goods are sold? Whether they are sold through a chemists' factor or a photo factor?" "No difference really; but there we are." "No, sir, I am not going to give a £20 order to bribe the P.P.M.A. to put me on their list. If I cannot buy as I want, like the chemist, I'll wait till the P.P.A. is formed into a limited company to make for the profession, or order what I want outside the ring, and leave them to their fate."—I am, yours, &c.,

OLD PROFESSIONAL.

To the EDITORS.

GENTLEMEN,—Being a professional dealer, I have read with interest the various letters on the above subject in your columns, but it appears that few of the writers know of the difficulties and expenses of the retailers, or they would not wish to cut them so close as they do.

I was the first in my district to keep goods for supplying amateurs, though there are now four others (chemists), and it was four years before I was acknowledged as a dealer by the Plate-makers' Association, and I, even now, after six years, get only 5 per cent. more than a large photographer. For this paltry 5 per cent. I have to keep a shop devoted mostly to photographic materials for amateur use, and thus pay heavier rent, rates, taxes, etc., keep an assistant to look after the shop, keep open longer hours, run much greater risks with bad debts and dead stock (a serious item with such perishable material as most photographic materials), as well as devoting a great deal of time and capital to this branch, which I am not sure but what might be more profitably employed in pushing my portrait business. A professional, again, gets orders value £2 carriage paid, whilst I have to get £5. This would not be any hardship if my customers would be content with one brand of plate, but I have to order from twelve and more plate and film-makers, and thus have often over £10 worth of any one maker's goods in stock at one time, as it is impossible to run out of all one make of goods at one time, and may have to order another £5 worth for the sake of quarter-plates of one rapidity, this all in addition to cameras, chemicals, etc. This extra 5 per cent. I maintain does not more than pay us for the extra trouble and expense, to say nothing of the time and annoyance we are often put to, and I for one will give up the dealing business if my profits are cut down even another 2½, and I have done more in this neighbourhood for the advancement of photography than all the other dealers put together. If all the professionals got their plates and papers from the manufacturers, the dealers would undoubtedly have to charge them a very great deal more on what they get from them to make up for the smaller turnover. The results also would be disastrous to both the trade, the consumer, and the manufacturer, as the dealers would not be able to keep anything like such big stocks of sensitive material as they do now, and so would have to limit their stocks to only the very best amateur selling stuff, so that there would be no room for new firms to come in with fresh goods, and without such healthy competition our art-science would cease to progress at the same rate that it has in the past. For some time I supplied one or two of my professional friends with plates, allowing them 10 per cent. on the quantities they took, but I found even at that it did not sufficiently pay me, as I almost invariably had to order direct from the maker for them, and as they rarely required £5 worth at one order, I got such large stocks of stuff that was rarely asked for that I have been compelled to ask them to get their materials either from the wholesale dealer or from the manufacturer.

It would be very interesting to know whether the members of the P.P.M.A. would all agree to allow full dealers' terms to all professionals and to the itinerant or only to those ordering a large quantity at one time, and also whether they would allow the same to the "shamateur" and to the amateur using large amounts of materials, in some cases I know more than many professionals.—I am, yours, &c.,

November 18, 1901. ONE OF THE 330.

THE CITY AND GUILDS EXAMINATION IN PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Your facetious correspondent is so kind as to attribute to me the invention of the mirror method of determining the focal length of a lens, but I regret that I cannot claim the credit of it. The method is much older than 1894, and when I wrote the account in THE BRITISH JOURNAL ALMANAC, to which he refers, I wrote of it as already well known to physicists.—I am, yours, &c.,

C. H. BOTHAMLEY.

Weston-super-Mare, November 18, 1901.

To the EDITORS.

GENTLEMEN,—I deeply sympathise with your correspondent, "Mr. A. Dunderhead," and I am sure that all past and future students must feel an immense debt of gratitude to him and his unknown friend for having thus put them up to such a valuable method of finding the answer to an otherwise unanswerable question. But, gentlemen, may I ask whether, as a future student, I am expected to know everything that Mr. C. H. Bothamley has ever written on the subject of photography? If so, may I ask you to kindly give me a list of his articles, that I may be quite ready at the next examination to cope with any question that this Admirable Crichton of examiners may put.

Again expressing my thanks to "Mr. Dunderhead," and assuring him that he will have the pitying sympathies of all married photographers,—I am, yours, &c.,

A POLYTECHNIC STUDENT.

To the EDITORS.

GENTLEMEN,—It is to be hoped that "A. Dunderhead" has by this time recovered from his exhausting researches. But it is surprising to see him mention, for instance, Glazebrook amongst the authorities unsacked unavailingly. In Glazebrook and Shaw's "Practical Physics," a well-known annual, there is (edition, 1893, page 352) the very method of finding the focal length of a lens that, doubtless, the examiners had in mind. Bothamley's modification is, however, a trifle simpler.—I am, yours, &c.,

J. DORMER.

November 15, 1901.

RIGHT TO SHOW SPECIMENS.

To the EDITORS.

GENTLEMEN,—In the last number of the JOURNAL I read with interest the report of a case tried in Glasgow re the right of exhibiting the portraits of customers as specimens without their sanction. I have often read in the Answers to Correspondents that to do so was illegal, and I have always acted on that assumption. Now, it is clear that you are wrong, and that they may do so, and I shall in future show as specimens any portraits that I think suitable for the purpose. I write this in the interests of other photographers who may hitherto have been debarred from showing portraits of customers through reading your opinion. Apologising for troubling you with this letter, which I write in the interests of others beside myself,—I am, yours, &c.,

PROVINCIAL.

[We should advise our correspondent to abstain from doing what he intends, or at least till the ruling of the High Court of Chancery is overruled by a still Superior Court, notwithstanding the decision in the Glasgow Sheriff's Court. Some comments on that judgment will be found in another column.—EDS. *B.J.P.*]

PHOTOGRAPHY OF MOVING WHEELS.

To the EDITORS.

GENTLEMEN,—In the case proposed by Mr. Welborne Piper, if a = velocity of lens, the centre of the wheel separates from the camera with vel. = $2a$; hence the top of the wheel has, with respect to the camera, vel. = $3a$, and the bottom has vel. = a. Therefore, if in the case of a fixed camera the top is shown just sharp with an exposure of one-twentieth second, one-thirtieth second will be required in this case.—I am, yours, &c.,

CLIFFORD E. F. NASH.

THE PHOTOGRAPHY OF MOVING FEET.

To the EDITORS.

GENTLEMEN,—The problem propounded by Mr. Piper on this subject is, as he says, very difficult to answer with absolute accuracy. As the feet are raised to clear the ground, they must describe a curve, or rather a combination of curves, and the exact nature of those curves it would be almost impossible to discover, even by experiment. Moreover, some men step higher than others, and the speed is probably not the same throughout the whole of the step.

The speed, however, may be calculated approximately—near enough for all practical purposes. One foot rests on the ground while the other is being moved forward; therefore, the feet must move, allowing for the curves, somewhat more than twice as fast as the body. This works out, for a man walking at the rate of four miles an hour, at about twelve feet a second; but, then, there is the upward movement of the toes at the end of the pace—probably the quickest motion of all. In order to be sure of obtaining all parts of the limb sharp, the shutter should be set quite three times as fast as for the body only.—I am, yours, &c.,

J. TILFOR.

November 16, 1901.

THE CONVENTION.

To the EDITORS.

GENTLEMEN,—In the issue dated November 15 I notice an interesting reference to the history of the "Convention." It is stated that the first meeting was held in Derby in 1886, and an enlargement of a group taken on that occasion was shown at the Photographic Club on October 30.

I beg to inform you that this group was taken on a plate 26 in. × 21 in. by myself, and the picture was not an enlargement.—I am, yours, &c.,

THOMAS A. SCOTTON.

Briar Lea, Alvaston, near Derby, November 16, 1901.

PHOTOGRAPHS REGISTERED:—

A. J. Robinson, The Studio, Long Stratton, Norfolk. *Photograph of giant oak.*

M. Monapenny, 10, Nile-grove, Edinburgh. *Photograph of Lord Archbishop C. Eyre.*

T. Fitzgibbon Forde, 15, Waterloo-place, Sunderland. *Photograph of the late J. Cameron.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

G. BRODIE.—Thank you for the cutting; but we had received a similar one previously. You will see the matter is dealt with in another column.

PLATE WANTED.—A. W. M. writes: "Would you be good enough to tell me where I could get a plate that will keep the gradation, and not clog up, even although a little over-exposed? I want a quick plate (not ammonia), but one where the speed is got by cooking; in fact, like the plate that used to be supplied by the Autotype Co."—In reply: Any of the plates now on the market possess the qualities you desire, if they are rightly used. But, of course, the makers do not publish how they make them.

PHOTOGRAPHY IN SOUTH AFRICA.—"S. A." writes: "Would you kindly tell me whether you think there is any chance of getting a good post in South Africa (at the present time) as an assistant operator (age 21), as I should like to get there? Would you tell me whether there are any good openings?"—In reply: At the present time, we should say, you would not stand much chance of a good post. Eventually there will, no doubt, be good openings for skilful photographers, but not until things get more settled than they are at present.

PHOTOGRAPHING GROUPS IN AN ORDINARY ROOM.—A. C. writes: "Will you be kind enough to give me a little information about photographing groups in an ordinary room? I am in doubt as to the best way of lighting. Will you tell me which is the best, magnesium ribbon or powder?"—In reply: We should advise you to employ the powder, inasmuch as its combustion is more rapid than the ribbon. Hence there is less chance of the sitters moving during the exposure. It may be used in any of the flash-lamps now on the market.

ACETYLENE LIGHTING.—"ACETYLENE" writes: "(1) Would you kindly give me your opinion as to the suitability of acetylene gas for photographic portraiture? (2) Is any danger attached to its use? (3) Is it possible to procure lamps suitable for the purpose? I am at present using magnesium flash-lamps, but find they have serious disadvantages."—In reply: (1) Good portraits can be obtained with acetylene gas. (2) Not if used with care, and a suitable generator be employed. (3) We believe that Messrs. Thorne and Hoddle, Victoria-street, S.W., supply a suitable apparatus for the purpose.

SHUTTER SPEEDS.—A. T. writes: "Given that the light is powerful enough, what rate would you set a focal plane shutter for a walking horse, and also for a trotting horse? And how do the links count in quickening the exposure? Would an ordinary T.P. shutter be quick enough, and what rate would you set it?"—In reply: It must necessarily depend upon the rate the horse is walking or trotting. Some horses walk or trot faster than others, and the shutter must be timed accordingly. If you are using the Thornton-Pickard focal plane shutter the firm will send you instructions for using it for different speeds. Write for them.

TONING BATH.—"ALPHA" writes: "I am accustomed to make this solution the day I wish to use it, as I fancy it deteriorates by keeping Am I right, or could I make a stock of the same to last a few weeks:—Carbonate of soda, 2 scruples; acetate soda, 4 drachms; gold, 15 grains; water, 20 ounces?"—In reply: If pure distilled water be used there is no reason why the solution should not keep for a few weeks. But if it is to be kept we should recommend a smaller proportion of carbonate of soda, say, one, instead of two scruples. The acetate of soda may then be increased to five drachms. The stock solution should not be exposed to light, as that would tend to a precipitation of the gold.

COPYRIGHT AND REGISTRATION.—T. A. writes: "Will you kindly tell me where I can get the information as to copyrighting, registering, or patenting some photographic novelties which I wish to do before putting them on the market? They consist of new methods of mounting prints, new printing process, new adaptation of photographs for ornamental purposes, and similar designs. What I wish to do is to select the best way of protecting the designs, according to the nature of the novelty."—In reply: The only way to protect your inventions is by patenting them. That you can do yourself, or through a patent agent. If you do it yourself, procure the forms, which may be had gratuitously at the Law Courts or through the Post Office, and fill in the particulars and forward, with the fees, to the Patent Office, Southampton-buildings, Chancery-lane. The fee for a provisional protection is £1, and for a four years' patent £4.

ALBUMEN PAPER.—G. H. TURNER asks: "Can you tell me of any one who albumenises paper who would albumenise me a small quantity, say, half a quire, according to a special formula that I would supply?"—In reply: We do not. Most of the albumen paper now used in this country is prepared abroad, and we doubt if any one would undertake to albumenise so small a quantity as a quire or so to any special formula. We think the only way you will obtain what you require will be to prepare it for yourself.

PORTRAITURE AT NIGHT.—D. KLOSE writes: "Will you please say if an incandescent gas arrangement of, say, five burners, a foot apart, with reflectors behind each burner, would allow of an exposure of five seconds or less; and also if the connection to an ordinary house pipe would allow of sufficient pressure being obtained, or is a special pipe necessary?"—In reply: Portraits can be taken by incandescent gas light. But whether with five burners, in five seconds or less, will much depend upon the distance the lights are from the sitter, the rapidity of the plates, and the aperture of the lens. The ordinary supply pipe to the meter will be large enough to convey the gas, but whether the pipe from that is depends, of course, upon its size.

DEVELOPER QUERIES.—P. C. SMITH writes: "(1) In making a solution containing (a) pyro, (b) potassium metabisulphite, (c) potassium bromide in water up to 12 ounces, what is the order of dissolving? (2) In making a solution containing (a) sodium sulphite, (b) washing soda, in water up to 20 ounces, do you dissolve these substances together or separately? (3) What are the different forms of sod carbonate? (4) Will solutions of (a) washing soda, (b) hypo, (c alum, keep indefinitely?"—In reply: (1) First dissolve the metabisul phite, and then add the other ingredients. (2) They may be dis solved together. (3) The only one used in photography is the crystallised carbonate of commerce. (4) Alum and washing soda will keep for a long time in solution; but hyposulphite of soda should be used, if employed for prints, within a week or so of its being dissolved.

DISCOLOURED BATH FOR ALBUMEN PAPER.—T. ALLISON says: "I have been for the last six months using albumen paper instead of P.O.P., buying it ready sensitised, and I like the results upon it better, and so do my customers. Lately I have been sensitising my own paper, which I get from ———'s, and I like the results still better. But I find, after the bath has been used for a few days, it becomes discoloured, and then it discolours the paper; so I have thrown the silver down as chloride, and added it to the residues, and made fresh baths. This makes the thing expensive. Can anything be added to the bath to prevent the discolouration?"—In reply: If a little kaolin be shaken up with the discoloured solution, and allowed to stand a few hours, then it will be as bright as at first, and as good for use. It is a good plan to keep some kaolin in the bottle, and shake up every time the solution is returned to it. Then decant, and filter when required for use. In this way the solution may be used indefinitely if its strength be kept up.

VARIOUS QUERIES.—"JUDEX" writes: "(1) Would you kindly say if the colour of enclosed prints approaches the 'true sepia' said to be obtainable on solio or other matte P.O.P.? I have omitted the alkaline stop-bath after the platinum toning, on the advice of the makers of 'Venus' P.O.P. Enclosed is 'Solio,' however. (2) Do you know of any good apparatus, consisting of base board and clips, for copying pictures by direct contact? There is one on the market, but I cannot remember the name of the maker. Would you also say what kind of plate, and whether exposure to gas or daylight would be best? (3) Can you recommend a really good photo paste for enlargements on India tint mounts?"—In reply: (1) The prints sent are certainly not like sepia in colour. Why not use the different papers according to the directions given by their makers? Those that suit one do not suit all. (2) We do not call to mind the apparatus, but an ordinary printing frame will answer the purpose. A slow plate. Gaslight is best, as it is more constant that daylight. (3) Starch paste is as good as anything. But special mountants are advertised, and it is against our rule to express any opinion on different makers' goods. Consult our advertisement columns.

BLACK STAINS ON PLATINOTYPE PRINTS.—"PLATINO" writes: "I should be greatly obliged if you could help me to discover the cause of the black streaks occurring on the accompanying platinotype prints. I was troubled with them some months ago, and then they disappeared. Now they are recurring in considerable numbers. It appears as though something was deposited upon the sensitive surface which increased the sensitiveness, and that the extra sensitised surface was extended by the movement through the developer. The marks do not occur on parts of the paper that have not been exposed to light. I have taken the very greatest care in every way to get rid of all dust from negatives, paper, and developer, and can think of only one cause of trouble—a small tortoise slow combustion stove, with coke as fuel, is burnt in the printing room and from this there are slight exhalations of sulphur. Would these produce the result seen upon the photographs?"—In reply: We should say that the spots are caused, not from the fumes from the stove, but from particles of solid matter from it on the surface of the developer. The spots are to be seen on the parts that have been exposed to light, though they, of course, are not so pronounced there as they are on the whites of the prints.

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EX CATHEDRÂ.

Atmospheric Light Absorbers. In a recent article upon exposures we referred to the effect of the atmosphere in obstructing a certain amount of actinism: the atmospheric absorption factor is an important factor, and is complicated by the fact that its absorptive power varies to a great extent. Londoners of late, and, indeed, to a less extent, almost every portion of the country, have enjoyed a very unpleasant experience of the manner in which the air we breathe may rob us of light when it contains suspended particles of moisture, especially particles imprisoning or coated with fuliginous matter. In that condition the effect in the air is visible to the eye, but there are photographic effects which are practically invisible, but which nevertheless greatly affect exposure. Mr. F. Vernon Harcourt, a great authority on such topics, wrote that during the recent fogs he walked down Gower-street, and had an opportunity of witnessing the relative effect of the arc, duplex incandescent, and ordinary gas-lights, this thoroughfare being lighted at different parts by the three systems. The arc lights were brilliant close to, but very quickly upon receding from them the lights were obliterated; in fact, midway between each they became invisible. The individual double incandescent gas-lights were never lost sight of; true, they were nearer together, but he considered their effect to be as good as could be expected. The ordinary old-fashioned gas-lights were less effective than the incandescent, but superior to the arcs. If this matter be considered from its photographic bearings, the actual effect of water particles is patent. They are comparatively large, and prevent the smaller waves of light—that is to say, the particular rays that have most photographic efficiency—but permit the passage of those waves, the larger ones, that are least useful. These considerations lead us readily to see how some districts—those in which light mists are frequent—may often be the poorer in actinic light than others, though by the eye no difference can be observed. Closely allied to the causation of these phenomena would appear to be the blue colour of the sky, the cause of which has for a long time been a matter of discussion with physicists. We learn from "Nature" that a paper has been contributed to the Vienna Academy of Sciences by Professor J. N. Pernter on polarisation of light is turbid media, considered in reference to the colour of the sky. The author has observed the polariscopic effects and the relation of the polarisation to the colour in various emulsions of mastic in water, and a comparison has been made between these effects and those observed in the light of the sky. He finds that the two phenomena are in close agreement, and an experimental test is thus afforded of Lord Rayleigh's theory of the colour of the sky.

* * *

Anhydrous Ammonia. Though carbonate of sodium has largely replaced ammonia in pyro development of late years, there is still a large amount of the former sold to photographers. At one time the use of anhydrous ammonia was recommended, but it is inapplicable except in the case of very extensive users, for the cylinders in which it is sent out have usually a minimum capacity of twenty pounds, which is equivalent to about six gallons, or twelve "Winchester quarts" of commercial liquor ammoniæ. The

largest cylinders hold about two hundred pounds. Naturally, with such a readily expansive liquid great strength is required in the cylinders, and they are usually made of steel, and tested up to fifteen hundred pounds to the square inch, and sent out, to fall in with railway requirements, cased in wood. These cylinders are not much dearer than the liquor ammoniæ: sold for their present price the latter is not much over a shilling a pound. Originally, half a crown was the price asked, but competition quickly reduced it to one shilling and eightpence, and eventually to a shilling. But it was then found that this price did not pay to produce it in a state of purity. It is now sent out by the Standard Anhydrous Ammonia Company of Great Britain, with works in London, the Midlands, and Lancashire. The advantage of this product is its great purity; it is virtually absolutely pure and free even from the slightest moisture, so that the photographer making use of it at once knows exactly the strength of the product, and need have no doubts of his results in using it.

* * *

Stoves in Work-rooms. The season has now arrived when some means of warming the work-rooms is a necessity, and it is a noteworthy fact that about this period of the year we begin to receive numerous queries from correspondents as to the causes of spots on prints which do not make their appearance until some little time—often a few weeks, sometimes days—after they have been mounted. In many instances the query is accompanied by the suggestion that the mounts may have been the cause. By the way, when stains, spots, fading, etc., arise, it is a very common suspicion that they must be due to the mounts and not to any fault of the photographer himself; while as a matter of fact, they are entirely due to perfunctory manipulation and nothing else. Last week we answered a correspondent with reference to certain spots on platinotype prints. The writer says in his letter that he was troubled with them some months ago, and then they disappeared, and now they are occurring in considerable numbers; and, he goes on to say, "I can think of only one cause of trouble: a small Tortoise slow-combustion stove, with coke as fuel, is used in the printing room, and from this there are slight exhalations of sulphur." Now, sulphurous fumes are very undesirable where photographic operations are going on, particularly in connection with silver processes, and most of the slow-combustion stoves, which are so frequently used in photographic work-rooms, are liable to emit them when coke is employed as the fuel, unless the draught is kept well open, and then they are no longer "slow-combustion" stoves. But the sulphurous fumes are not always the worst evil with them. It is tolerably well known that when these stoves are raked out, as they usually are in the morning before the fire is lighted, there is a considerable amount of dust created, also that the finer particles of it take a long time to settle. These particles are generally composed largely of sulphurous matters, and if they settle on silver prints while they are in a moist condition, as they are, for instance, when they are freshly mounted, it is not surprising if they have an injurious action on the prints wherever they may rest.

This action will not be immediately noticed, perhaps, as it only becomes apparent after a time as small spots, usually of a pale yellow and, sometimes, dark nucleus. The particles are, of course, more adherent to gelatine prints than they are to either albumen or collodion ones, and if they are rolled into the surface, as they are when the prints are rolled or burnished, their deleterious action will be hastened by reason of their more intimate contact. By way of experiment we, some two or three years ago, took some gelatine prints out of the washing water and laid them on sheets of blotting-paper in a room in which a slow-combustion stove, with coke as fuel, was burning. The ashes were then raked out, so as to cause a dust, and the prints left where they would dry slowly. They were then mounted and rolled in the ordinary way. In the course of a few days traces of minute spots made their appearance, and in the course of two or three weeks we had a crop of spots equalling anything we have seen in that direction, and these spots were of precisely the same type as those we are so often consulted upon. Corresponding prints, it may be mentioned, that were dried away from the dust, showed no indication of spots even after long keeping. The dust of work-rooms generally, when swept out, it should be borne in mind, is usually highly charged with deleterious matter in the form of minute crystals of hyposulphite of soda, developing agents, and the like from the solutions of them being spilt or splashing on the floor. These, when swept up, create a dust, the particles of which are highly pernicious in contact with moist silver prints, by whatever process they may be produced. The moral therefore is—keep the prints carefully protected from dust whenever they are in a damp condition.

* * *

Cold Dark Rooms. Many photographers have already experienced, either in their comfort or by retarded development, or the like, inconvenience from the recent advent of cold weather. Of course, in all well-appointed establishments attention is paid to the heating of the dark rooms during the winter weather. This is not, however, always the case in minor establishments, where often the dark room is a small apartment at the top of the house where the studio is situated; or, in the case of amateurs, frequently in the basement, where possibly it is little more than a cupboard. In either case, alike for the comfort of the worker and the action of the chemicals, some method of heating becomes necessary, and then comes the question as to the best method. Frequently cost becomes an important factor in the case. A gas-stove naturally suggests itself as the most convenient, and in some respects so it is, but gas is not always available, and, even when it is, it does not always prove the best, for the fumes from it, if they are not carried away by good ventilation, are often injurious to the health of those who have to inhale them for long periods together. Moreover, the fumes given off from burning gas are deleterious in some photographic processes—the carbon process, to wit. Slow-combustion stoves of the Tortoise type are very convenient, but they require a flue to carry off the smoke, which is not always possible, and, even if it were, there is always the dust from it to be considered whenever it is fresh stoked. On the whole, therefore, it seems that a kerosine or paraffin oil-stove will be about the best thing to employ. As the type of dark room we have in mind is small, and the door is usually kept shut while working in it, an oil-stove, with, say, a four or four and a half-inch wick, will keep the room throughout

the day at a comfortable working temperature. A common paraffin lamp, with an inch wick, left burning at night will also keep the chemicals always at a tolerably equable temperature, particularly if the dark room is in the basement of the house, and that is where so many amateurs' "dens" are situated. An objection to paraffin stoves may be raised, namely, that they "smell" while burning. When that is the case, in nine cases out of ten it is due to neglect—either the lamp and its fittings, on the outside in particular, are not kept clean, or the wicks are not kept in order. When these points are attended to there need be no offensive fumes given off from a well-constructed stove. If there are any, however, they will have no injurious effect on those exposed to them, nor will they have in any photographic process.

* * *

Lenses for Stereoscopic Photography. In a paper on "Stereoscopic Photography," read by Mr. W. Goodwin before a recent meeting of the Glasgow Camera Club, he said that the focus of the lenses he uses is four and a half inches, as he found that the five and a half or six-inch, as advised by some authorities, embraced too narrow an angle for many subjects. This is a subject that we have before dealt with. The latter foci are very suitable for distant subjects, such as breaking waves and the like, and the lenses used by the late Mr. G. W. Wilson for his once-famous stereoscopic views of breaking waves were of six inches focus. But this focus is too long for the subjects that usually compose stereoscopic pictures, as they embrace too narrow an angle to be pleasing or conducive to the best stereoscopic effect when viewed in the stereoscope. Why should not a stereoscopic view include as wide an angle as an ordinary photographic picture does? Now the favourite half-plate picture is usually taken with a lens of about eight and a half inches focus, and with that the angle included is a pleasing one. If that is a pleasing angle, why should not a similar one be used in stereoscopic pictures, in which a still wider angle is often desirable? To secure it, supposing the base line of the pictures to be three inches—though two and three-quarters is better—the lenses should not exceed three and three-quarter inches in focal length for ordinary subjects, and still shorter if a wider-angle picture is desired, as is often the case when interiors are photographed.

* * *

The Photograph and the Pound of Tea. Photography has frequently to suffer from thoughtless schemes of business men, who grasp at it as a means of furthering their own interests, but the hardest blows inflicted upon it are sometimes dealt by those who rank as professional photographers. One of the hopes we cherish with regard to the Professional Photographers' Association is that it will cultivate a spirit of respect for the interests of photography as a means of honourable existence. Judged by this standard, what must be the unanimous opinion of photographers, who have any thought for their calling, concerning the agreement entered into by a Continental firm under the following conditions? We see, in the "Allgemeine Deutsche Photographen Zeitung," that a number of Munich tradesmen give a discount to their customers upon the amount of their purchases. A firm of photographic dealers, who also carry on business as photographers, have entered into an arrangement with these dealers for the issue of stamps representing the amount of discount given. These may be affixed to a card, and when the amount they represent is sufficient, the customers may present the cards to the photographers in payment for their photographs. This system is now being boomed under a catch-penny name:—"Deutsche Photorosa." In other words, photography is brought to the level of being given away with a pound of tea. Surely, there is scope in Germany for a Professional Photographers' Association, if the Deutsche Photographen-Verein, or some kindred association is incompetent to strengthen professional feeling amongst photographers sufficiently to restrain them from practices of this kind.

* * *

An Excursion to Jena. An account is given this month, in the "Deutsche Photographen Zeitung," of the visit of the Deutsche Photographen-Verein to the Carl Zeiss optical works at Jena. The annual gathering of the Association resembles that of the Photographic Convention of the United Kingdom. After visiting the optical works and the well-known glassworks of Schott and Genossen, the Association was entertained with supper. In welcoming the guests, Dr. Czapski referred to the intellectual activity stimulated by the strides photography had made, and showed how opticians had striven to solve the difficulties that confronted the lens. With subtle humour, he expressed the regret he felt that he could not show them the workshops where these conquests had been made. They had been won in the minds of men, and, notwithstanding the acknowledged advance which had been made in the art of optical projection, we had not yet succeeded in projecting the image of an inventor's brain at work. Their disappointment need not, however, be complete, for they could show them many things. The whole history of technical discipline demonstrated how important it was to achieve perfect material embodiment of the ingenious creations of thought, and they cherished the idea that in the sphere of their activity they had not given less attention to the one than the other. If they had not been able to visit the holy of holies—and it would not have interested them to see the interior of a calculating room, with its discs, tables of logarithms, and books filled with columns of figures—they still had been able to see what was of great value, the technical embodiment of inventive thought by the hand of the mechanic and optician, assisted by suitable tools and machines. This apt description of the creation of a lens, which might almost be described as the material solution of a mathematical problem, deserves to be noted. Few photographers realise how much thought is bestowed upon the manufacture of a first-class objective.

THE ROYAL PHOTOGRAPHIC SOCIETY: PROXY VOTING AND THE QUESTION OF REFORM.

Those of our readers who are members of the R.P.S. will have noticed that we have been to some considerable trouble to explain the reasons why we thought proxy voting was allowed at the meetings of the Society. We have practically had to do this on our own responsibility, as though we referred the case to a leading authority on company law, we

have only received the final expression of his opinion within the last few days. He points out that section 15 of the Companies Act, 1862, in his opinion, cannot be held to apply to the R.P.S., as the section only holds good for companies "limited by shares," and the R.P.S. is limited by guarantee. It is with considerable regret therefore that we find definitely that proxies cannot be employed at the R.P.S. meetings as long as the articles of association remain as they are. Members need not despair, however, as the many expressions of opinion which we have had on this point fully show that before any further changes are put forward, the right to vote by proxy must be established. We do not think that we are giving away any Court secret when we say that this proxy question has been referred to the highest authority in this country on company law—Mr. Palmer. We fear, though, from what our own adviser has told us, that the author of "Company Precedents" will not be able to establish the legality of proxies under existing rules. It, however, serves to show that we struck the correct note when we raised this question, and though a special meeting will have to be called to put the resolution for their adoption to the members, it is better that this should be done now than later on. It is undoubtedly very annoying to have so many meetings of the members specially summoned to consider constitutional matters, but it would be far worse when their necessity has been established were the officers of the Society to shirk their duties.

The President has set a good example in bringing these projected changes before the general body of mmbers, and his firm attitude should reassure them of his sincerity in his purpose. There can be no one better able to judge as to whether the changes are necessary or not than the President, and those who know Mr. Dallmeyer cannot doubt but that he is doing this, not for any personal notoriety, but for the good of the Society, the interests of which he has so deeply at heart.

These meetings in themselves doubtless are a drain on the Society's resources, but it is a drain which the R.P.S. must face now once and for all, as it is an easy matter to arrange that similar meetings be limited in some way or other. Errors, however, must be corrected, and the truth established, and when the Society has unanimously—not sectionally—fixed its basis for government, then, and only then, can its work be peacefully proceeded with. The country membership of the R.P.S. is very large, and it is of vital importance to the life of the Society that these members take part in its work. Proxy voting opens up an easy and inexpensive road to this end, and we ask our readers, who are members, to one and all insist on having proxies legally established. The country members must be drawn into a closer union than now exists; they must feel the pulsations of the Society throbbing in their own veins, and until this is the case, and the present sectional control disestablished, the Society will never rise to occupy the position which it must feel itself called on to take amongst the learned bodies. The field which the Society has to work is a very large one, giving scope for the greatest variety of talent, and the R.P.S. can be made to be a strong power if it will only throw off its present state of apathy and bestir itself—the grandest problem in the education of the mind is to give it the least possible amount of one-sidedness with the greatest amount of force, and in addressing this notice to our readers we do so because we want to see the Royal Photographic Society not addressing itself to a small membership of hardly a thousand, but to the many thousands who constitute the photographic world, and who should be able to look up to the R.P.S. as their leader.

SINGLE AND DOUBLE LENSES.

Photographic terminology suffers from a distinct want; in the earlier days of the art the term "landscape lens" expressed all it was desired to convey, for virtually all lenses were then landscape or portrait lenses. But, as the scientific study of photography increased, so also did related optical investigations, and, gradually, there came to be on the market lenses belonging neither to the one category nor the other, though two lenses were for a long time in general use—the old landscape type and the rectilinear type, or, as they were often called, single and double lenses. No confusion was then likely to arise, and the photographic world jogged along contentedly. But eventually, and as users of the camera became almost universal, an immense variety of lenses came into practical use, which these terms insufficiently described. The earlier hand cameras were fitted with single lenses which were composed of a single piece of glass, and alongside of them were other "single" lenses, which were single only in appearance, as they consisted of two glasses cemented together, so that they were really, in the strict sense of the term, compound; yet, if they were usually to be spoken of under that name, what was to become of the old compound lens, which term of itself might be applied, and was applied, to an already varied series of types. The rectilinear type was well known; but an eminent optician brought out a compound lens consisting of a pair of lenses with an air-space and diaphragm mid-way, the component lenses being strictly single, while in the rectilinear each component is double. There was put on the market a triplet, consisting of three lenses, when already what might be termed a triplet of three cemented pairs with two air-spaces, known as the orthoscope, was in existence. The term "simple lens" became still more confused by a landscape lens composed of three lenses cemented together being designed, and finally one with four lenses cemented into one whole. If now we turn to so-called "double lenses," the confusion becomes apparently irremediable. We were willing to sit content under the use of the term "double" when applied to the early "doublets," and their successors, the "aplanatic doublets," the rectilinears, and the symmetricals, as, in outward appearance, at any rate, they much resembled one another. But when they were succeeded by another compound lens, a triplet, with two air-spaces, each component being a true single or uncemented lens, the term became almost meaningless.

The introduction of the Jena glasses gave an immense impetus to invention in photographic optics, and the "double" lenses had representatives in which a cemented doublet and a cemented triplet with one air-space took the place of two cemented doublets similarly separated from each other. Before long, however, we had another "doublet," consisting of two cemented triplets, with an air-space between. The lull in invention did not last long, and, in lieu of a pair of cemented lenses, each element of the

pair, as we say, containing three single pieces of glass, we were presented with a still more elaborate type, four lenses being used in each pair.

These, however, did not exhaust the inventiveness of the modern optician, and we had given to us a new power by means of a lens consisting of, first, a single lens, then an air-space, then a cemented double, another air-space, followed by another cemented double lens, another air-space, and a final single back lens—the most expensive and the quickest of all these modern lenses.

With one exception these later improvements came from abroad; but our English opticians were not idle, and they evolved still another type, complicating the nomenclature still further. This lens is composed of three pairs of lenses, each of the three components being a cemented lens, there being thus two air-spaces.

The last addition to this long list of varieties in lens construction and nomenclature is in the direction of simplification of design, in that it consists of only four single pieces of glass arranged in two pairs with an air-space between the pairs, the pairs themselves being not cemented, but separated; there are thus three air-spaces or air lenses, as these spaces have more lately been termed, and correctly, as it seems to us.

When the City and Guilds Examiners in Photography, desiring to test the practical acquaintance of the candidates with the properties of photographic lenses, set the question, "What are the advantages and disadvantages for outdoor work of a single photographic lens as compared with a so-called doublet?" we can sympathetically enter into the difficulties that the present loose and inconsequential terminology of the subject would cause them to experience in endeavouring to steer clear of the Scylla of ultra-diffuseness and the Charybdis of inexactitude of terms. We have shown, we think, very conclusively the difficulties that exist. We do not propose to offer a remedy, and we leave its discovery to the sapience of our readers.

ON THINGS IN GENERAL.

THERE has been quite an old-world flavour about the correspondence and other columns of late, so much so that I rubbed my eyes, and wondered whether it was the new century I was living in or a long way back in the last. Thus it was when I read last week a query about albumenised paper and the silver bath. It was absolutely refreshing to learn that some one was desirous of learning the A B C of albumenised paper work, and still more to find that both the correspondent and his clients preferred such prints to those on P.O.P., and well they may, for up to this day a good albumenised paper print has a quality which no gelatine P.O.P. with its meretricious effects can reach. It may be prejudice on my part, but I hate such prints, and never produce them. It is true that it needs more skill to get uniformly good work on albumenised paper, but to my mind that is an advantage. Why should processes be esteemed that are so easy that any one could work them? Such simplification it is that has been one important factor in bringing down prices for professional photography. But to return to our subject, it may be well for Mr. Allison to know that if he has been using P.O.P. mainly he will have to produce a different type of negative for printing on albumenised paper: it must be much denser. As to the discoloration of the silver bath, the editors have put him on the right track and told him of a method which I well remember using over forty years ago. Personally I preferred the plan of making the bath self-cleansing as it were, by dropping about half a drachm of strong solution of carbonate of soda into it, and, after making up, filtering, keeping the same as long as it would last. Then so long as any of the precipitate of carbonate of silver remains the bath will be kept neutral and will remain colourless.

Then again there was a discussion at one of the Societies about the permanency of prints toned by the combined toning and fixing bath. What a time-honoured discussion that is. It is now about forty years ago or more that Messrs. Davanne and Girard carried on their classical investigation upon this subject. We have virtually had no fresh light of importance thrown upon the subject since. That investigation laid the foundations of the success of the old alkaline toning bath, which, in its early days when cutting prices were not, was usually carried out with plenty of margin of hypo—plenty of hypo of good strength, and few faded prints will be seen by the alkaline gold toning. A priori there is no reason why prints by the combined bath should not be as permanent as by the alkaline; but the danger lies in the fact that the longer the bath is in use the richer the prints it gives and the greater the probability of fading. With this bath used fresh, and not acid, and using a sufficiency of hypo, there is every probability of equal permanency with the alkaline; but there must be no using the bath a second time, which means more gold and—cost!

In the same column as the query about discoloured baths is another respecting incandescent gas-lights, where it is required to know if special pressure is required for them. The inquirer should know that these lights require no special pressure; indeed, the ordinary pressure for a good bat's-wing or fishtail is excessive for an incandescent burner of the old type. To get the best value out of these burners, it is needful to very carefully adjust the pressure by reducing it generally. If too great, only one-third the full illumination is obtained, so that we get the condition of using more gas and getting less light. Few people use for ordinary lighting a burner of so small a size as No. 3. Yet the gas needed for such a burner is amply sufficient for an incandescent with six or seven-fold illumination with the latter. This can be readily proved by placing an incandescent burner over a No. 3 bat's-wing, wrapping an old duster round the junction to prevent much escape, and then lighting the mantle burner. It will be found that quite enough gas comes through the No. 3 to produce a perfect light. From this it will be seen that a very small gas supply will suffice for five Welsbach burners.

There are, however, two points in this connection that may be noted: first, that burners are now made for which it is claimed that the illumination is a direct function of the gas consumed—the more the gas the greater the illumination. Secondly, there has recently been put upon the market an adaptation of the ordinary burner which is a most remarkable improvement. It consists of an addition to the base of the burner by which the air access outside the flame is contracted, and the use of a shorter and wider glass chimney with a series of perforations near its base. This additional attachment—as also the chimneys—can be purchased separately, and put on by the consumer. The gain in light is very noteworthy.

Another correspondent has been asking for information about rights of light, and the Editors have pithily informed him how he stands. But he should read their reply closely. The matter is exceedingly simple. No law in the world can prevent a man in this country from putting as many windows as he wishes in his house; this is not generally understood, but it is literally true. But then on the other side if a neighbour objects to any such windows he can prevent them being of any use by erecting on his own premises—this last clause should be noted well—any obstacle he likes that will prevent access of light to the objectionable windows—provided that, and here lies the gravamen of the whole matter, the obstacle he erects does not on its part obstruct the light to any other window which by prescription or sufficient usage the occupier possesses. The obstruction-erecter, though he may put up an obstacle, may not nail it to the wall in which the objectionable window is situated. The effect of this is that if any lane, passage, or roadway intervene between these adjacent properties, the person desirous of erecting an obstruction will necessarily be put to considerable expense if he have to build his obstacle for the sole purpose of light-obstruction. To put a con-

crete example, we may suppose the would-be studio-builder has a window on the ground or first floor in the same wall as that in which on the upper floor he wishes to build a studio. The aggrieved neighbour may place boarding against the new window, but will have to support it from the ground, he may not nail it, and if any strip of common ground such as a narrow path intervenes, it will be a big undertaking to obstruct access of light to the new window without obstructing the old windows at all. These considerations will weigh in estimating the chances of making a friendly arrangement with a neighbour, with regard to which, I may say, as the teaching of a lifetime which has been unusually fruitful in such experiences as we have been considering, "Never, if you can avoid it, quarrel with a neighbour."

About these rights there is no question, and so one would have thought was the case with regard to the right to exhibit a portrait with or without consent; but it appears that the Sheriff of Glasgow thinks otherwise, and he has refused redress in the case of a sitter who objected to have his portrait exhibited, notwithstanding Justice North's emphatic and unambiguous judgment to the contrary in the oft-quoted case of December, 1888, in the High Court of Chancery. There is an aspect of this case outside the boundary of law. It would appear to be a principle beyond contention that no self-respecting photographer would exhibit a portrait against the wish of the sitter, to do so would be against all principles of ethics and considerations of ordinary courtesy. A sitter ought to be able to feel that his portrait is as sacred as the secrets entrusted to, say, a doctor or a solicitor. This one point is unfortunately one on which, I have read, the Copyright Union hold views contrary to mine. They consider that the possession of copyright gives power to publish as against the sitter's will: such contention is the strongest weapon which the anti-photographers can wield in their efforts to kill photographic copyright.

Most of the readers of this JOURNAL will have been amused with Mr. Harry Furniss's account of his fiasco at a lantern lecture, when his audience would smile when they ought to have looked grave. He discovered that the cause of hilarity lay in the fact that a fly was seen walking on Mr. Gladstone's nose on the screen. "It had walked into the professor's parlour—that is to say into his lantern—and taken up its temporary residence between the lenses." Now if it was in the lantern the lenses could only be condensers, and one immediately wonders what sort of condensers were used that would permit a fly's access between them, and next, having got there, what wonderful sort of condensers they would be that would give a fly in thei interior and a lantern slide in front of them in focus at one and the same time. "Si non e vero e ben trovato." Some one wrote a week ago asking about photographing a cellar by flashlight. It will be well for him to remember that whatever preparation or substance he uses there will be some considerable amount of fumes given off, a fact which it is well to bear in mind if the possibility of a second exposure is a consideration. A considerable period would have to elapse before the atmosphere would be clear enough to take another negative.

FREE LANCE.

APPLICATION OF PHOTOGRAPHY TO LEGAL RECORDS.

[A Paper read before the Section of Photography and Microscopy of the Franklin Institute, Philadelphia.]

THE transfer of real estate, under which term (disregarding legal hair-splitting) we may understand land and the buildings thereon, has always been a matter of some difficulty and complexity. In many times and places land was and is practically inalienable. Even now, in the most enlightened nations, the legal fiction is that all land belongs to the supreme authority, that is, the crown in such a country as England, and the State in such a country as our own. Upon this principle rests the right of eminent domain which the State sometimes exercises in its own interests and sometimes confers upon corporations. Land being irremovable, the occupancy of it is not evidence of ownership, and it is impossible to conceal its existence. As it is the only natural monopoly it is the foundation of all wealth in the strict sense of that word. If we carefully analyse the transactions of both nations and individuals, we will find that a common impulse of humanity is that of land-grabbing, whether it be the conquests of a Joshua or Cæsar, or the "benevolent assimilations" of our own age and country.

The enlightened nations of the present day differ considerably as to the amount of land transfer and the methods of it. We are so accustomed in this country, and especially in this city, to the public record of deeds, mortgages and judgments, and to the publication of names of sellers and buyers, and even of delinquents, that we are surprised to learn that this is not by any means universal, and in some places quite against the will of the community. Some notable contrasts are to be found also among what are considered happy countries, in regard to the distribution of land ownership. Thus it is stated on good authority that the average number of land transfers annually in France is about 800,000, while the total number of land owners in England is only about 200,000, so that for England to have as much conveyancing business as France would require that each English owner should make transfers four times each year.

In Philadelphia the exact extent of the business is not easily obtainable, but by inquiry at the office of the Recorder of Deeds I learn that in the record work about 400 books are filled each year, each book containing 560 pages of the size of the large counting-house ledgers. This will make nearly 250,000 pages per year. These books contain principally deeds and mortgages, about equal number of each; releases, power of attorney and some other documents affecting property make up the remainder. To make these copies, which are expected to be word for word, a large force of transcribing clerks is maintained.

Mr. J. W. Ridpath kindly ascertained for me the statistics of two of the adjoining counties for 1900, as follows:

Montgomery County, 5548 documents, 12,000 to 14,000 pages.

Bucks County, 2684 documents, 5210 pages.

Another very important record department is that of the Register of Wills. In this city, and I believe, generally, it is the rule to preserve the original document and furnish to interested parties a certified copy. The original may be seen by any one. These methods are obviously open to the same objections that apply to the transcription of deeds and mortgages, with the additional one that as the original is open to inspection it may be liable to injury. The number of wills registered in Philadelphia in a year is considerable. A lawyer of this city told me that a will was filed not long ago in a city of western Pennsylvania, of which three official copies were furnished by the register's office, and all the copies differed, although all were duly certified as exact.

It must be apparent to every one that transcriptions by hand are at best clumsy. The Philadelphia departments are in good repute with attorneys, but even under the most favourable circumstances there is considerable delay in the recording of an instrument. This does not operate to the disadvantage of parties, since the instrument takes effect at the moment it is presented for record. The possibilities of error in transcription must always be in mind, although here, again, there is less risk, because the original document is returned to its owner, and this document is, of course, always the best evidence.

Some countries have adopted a plan by which the original document is deposited at the registry office; but this method is in vogue to only a limited extent, and even it is not free from objection.

When the systems of transcription were inaugurated, the possibilities of photography were not only unknown, but were quite unsuspected. At the present day the art of duplication of writing or drawing has been brought to a high degree of perfection. Several methods are known by which such reproduction can be accomplished rapidly, accurately, and cheaply. Nor is the work confined to the copying of well-made originals consisting of black lines on a white ground; even old yellow manuscripts on parchment can be reproduced with vividness not appreciably inferior to the originals. As some of those present will remember, I exhibited at a former meeting a fine sample of this class. Lead-pencil writing on common white paper can be well reproduced.

Briefly, I propose that for all documents which are to be copied

for record a negative shall be made either of full size or somewhat reduced, if thought permissible, and from the negative prints shall be made by the best processes. The negatives are not to be kept, hence the same glass can be used a number of times. The paper must be of the best quality, especially as to its resistance to decay. There is nothing in the problem that is uncertain or indefinite. Photography of this character can be carried out independently of the weather or time of day; permanent pictures can be made and control can be exercised over the work at all points. With regard to wills, I propose that even if it be thought necessary to keep the original document the public should be allowed access only to the photographic copies, which should be bound in indexed volumes. To facilitate the work some method of drawing up legal documents may be laid down, such as standard size of sheet, character of ink, and other details; but I am informed by an attorney that recording officers would, under present laws and customs, probably be obliged to accept for record any legible document, so that very close requirements would probably be impracticable at first, and as far as wills are concerned, of course impossible. However, whatever the eyes can read, the camera can also read, and there will be no practical difficulty on this point.

Mr. Getty, of the International Engraving Company, has kindly made a full-size copy from a mortgage loaned me by an attorney of this city. The original is about thirteen years old, and hence presents some greater difficulty than a fresh document; but, as will be seen, the result leaves nothing to be desired. In fact, the attorney who loaned the document mistook the copy for the original.

HENRY LEFFMANN.

FUZZY PHOTOGRAPHY: A CONDEMNATION.

[Abstract of a Paper read before the Edinburgh Photographic Society.]

It is hardly necessary to describe in any detail what is referred to under the designation of "fuzzy" photography. It is a style of work which generally appears in the landscape section of exhibition catalogues under such titles as "An Evening Effect" or "A Misty Day," or in the figure section as "A Portrait Study," and in each case the outstanding character of the production is the general blurring of outlines and an entire suppression of detail. The subject is either buried in funereal darkness, or appears as if composed of some peculiar combination of smoke and cotton-wool.

The origin of this kind of work was due to a desire after something less mechanical than the formal and sharply focussed transcripts from Nature which were characteristic of the earlier developments of photography. The subjects found most suitable for expressing and drawing attention to the newer mode of representation were those in which mist or evening shadows were naturally present, and where softness of outline and subordination of detail were already at the hand of the photographer. As the resulting effect was admittedly superior in artistic expression to the earlier photographic work, and represented quite correctly the particular atmospheric conditions contemplated by the photographer and familiar to the spectator, this class of work sprang quickly into favour with artistically trained judges at competitive exhibitions. The frequent association of medal awards with this style of photography soon developed the conceit that pictorial art consisted in fuzziness, and this, in turn, developed into the mistaken idea that fuzziness alone was pictorial and artistic.

Now, if it were a mere question of individual likes and dislikes, and if the case were simply that a certain number of people, however limited, insisted on their partiality for this fuzzy photography, and on their actually preferring it to any other style, there would be no occasion for any formal discussion such as I now propose to offer. It would be a case of each one suiting his own taste. If this school of fuzzy workers even limited itself modestly to the claim that the work produced by it has certain artistic qualities, and is entitled to be ranked, to a certain extent, as artistic work, there might still be no ground for special adverse comment or protest. But the case is altogether different. The devotees of this class of work assume an assertive air of exclusive superiority that can only be met by a detailed and systematic examination of their claims. Both in private work and in public exhibitions they assume the attitude that their favoured fuzzy photography is not only artistic in itself, but that it alone is artistic; that no other kind of work has any artistic quality whatever, and, in paricular, that all photographic work showing detail and sharpness of definition is beneath consideration and regard from the artistic standpoint.

Another objection to this kind of work is its injurious influence on the photographer himself. Although fuzzy work may at first be due to a voluntary and temporary choice of special pictorial effects, the steady adherence to it gradually dwarfs or narrows the worker's range of sympathies, and his powers of observation and expression, until at last he becomes unable to see or to express pictorial effect under any other forms or conditions except that of fuzziness. On this point Ruskin says: "Let the painter arrogate the right of rejection, and he will gradually contract his circle of enjoyment, until what he supposed to be nobleness of selection ends in a narrowness of perception. Dwelling perpetually upon one class of ideas, his art becomes at once monstrous and morbid, until at last he cannot faithfully represent even what he chooses to retain; his discrimination contracts into darkness, and his fastidiousness fades into fatuity" ("Modern Painters," iii. 35). A practical corroboration of this can be obtained by contrasting a representative collection of art photography with a similar collection of pictorial art, such as the newly-completed serial publication entitled "The Hundred Best Pictures." In the collection of art photography the large preponderance of pictures will be found to represent a restricted classification of misty effects or eventide studies, whether in landscape or figure subjects. The collection of pictorial art, on the contrary, will be found to range over a varied list of subjects, shown under equally varied conditions of light and weather, misty and clear, sunshine and shade. In the collection of "The Hundred Best Pictures," instead of a preponderance of misty, gloomy, or fuzzy subjects, I find not more than six at most falling under such a classification, all the rest showing clear lighting and detail. The same result is obtained by contrasting the work of a single artistic photographer, such as Mr. Horsley Hinton, with that of a pictorial artist such as Sir J. E. Millais. Take, for instance, Mr. Horsley Hinton's book on "Practical Pictorial Photography," and out of about forty definite examples of pictorial work either produced or selected by the author, all but three or four at most are gloomy evening effects or fuzzy subjects. Contrast with this the wide range of subjects and of treatment found in the work of Sir J. E. Millais, and it will at once become apparent how well founded is the criticism based on the assertion of the narrowing and dwarfing influences arising from an addiction to fuzzy photography.

There is another respect in which these producers of fuzzy work make a fundamental departure from the recognised principles of artistic work. Every truly successful craftsman and artist adapts the character of his work, and his mode of expresion therein, to the tools and materials with which he works. Thus the sculptor, working with mallet and chisel upon solid marble, gives expression to his ideas and sentiments by the harmonious arrangement of graceful contours. The architect, working with chiselled and sculptured stones, gives character and expresion to his creative work by the proportion and balance of the lines of his masonry, and by the blending or contrast of light and shade thereby produced. The painter, working with brush and flowing pigment, finds his chief medium of expression in colour. Now, on this same principle, the tool of the photographer is the lens, and his medium of expression is light-rays acting on the sensitive film, and so the starting point of his work, as well as of those others, if it would really rank as artistic, should be the recognition of the leading capabilities of his working tool in relation to its medium of expression. These leading capabilities are, without question, the power of accurate drawing and fine definition. When the photographic artist restricts himself to the production of fuzzy work which could, for all practical purposes, be as well produced by a cheap spectacle-lens, or even by a pin-hole, he deliberately rejects the characteristic capabilities of the available tools of his craft, and thereby not merely runs counter to the established principles of art-work, but unjustifiably limits the powers and range of artistic expression possible to his particular art. This connection between the form of artistic expression, and the medium by which it is expressed, has a direct bearing upon the question of sharp focus and record of detail. The brush-artist cannot attain to full sharpness, nor to full expression of detail, from the very nature of the tools and medium of his art. But the difference between him and the impressionist photographer, as seen in such reproductions of standard works of art, as I shall show later on, is this—the brush-artist endeavours by the character of his brush-work and its surface-texture, to suggest the form and detail which it is unable fully to portray, while the producer of fuzzy photographs deliberately tries to suppress the form and detail which he is well able to record.

Now, by way of conclusion, I should like to formulate in a few words what, in my opinion, should be the theory and practice of the pictorial photographer who aims at something higher than mere mannerism. The alternative to mechanical sharpness and crowding of detail is not fuzziness, but softness and gradation of tone, not the suppression of detail, but its intelligently harmonious subordination; and this should be secured, not by a strained use of the camera, but by studying and reproducing Nature in her quieter and softer moods, and under appropriate conditions of lighting and atmosphere, combined with careful attention to selection and composition. By the adoption of such methods, there would be a distinct widening of the range of photographic art, and the elevation of pictorial photography to a higher and healthier sphere. When that is attained to, fuzzy photography will be relegated to a very subordinate place, and accorded a merely inferior rank in the sphere of pictorial art.

P. M. MACINTYRE.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

THE usual monthly meeting of the Hull and District branch of the Professional Photographers Association was held at the Grosvenor Hotel, on Nov. 6. The following gentlemen were present:—Messrs. D. Abba, H. Abba, W. Barry, M. Boak, E. Cooper, C. Delf, W. W. Duncan, W. Fussey, W. Hancock, L. Holzheimer, C. Jones, J. Osbourne, E. Pettingell, E. Phillips, J. W. Shores, F. Slights, G. Thompson, T. C. Turner, A. J. Wellsted, and E. Elliott (of Messrs. Elliott and Fry).

The Chairman (Mr. W. Barry) had great pleasure in introducing Mr. Ernest Elliott, who had very kindly come from London in order to address the local members of the P.P.A. on the subject of "Invitation Sittings." No doubt there were diverse opinions on this question, and they might not be prepared to endorse those held by their visitor, but they appreciated this opportunity of welcoming Mr. Elliott to Hull, and must agree that his presence in their midst was one more sign of the interest which photographers of eminence took in the Association and the views held by its provincial members.

The Hon. Secretary (Mr. T. C. Turner) reviewed the circumstances which had led up to this discussion, and reported that at the last ordinary meeting in London he had given an account of the Hull meeting, at which the system of invitation business was denounced as unfair. But although Mr. Ernest Elliott had been good enough to visit the Hull branch, it must not be supposed that Messrs. Elliott and Fry were alone in this class of business. Many other photographers were known to be operating in the district upon somewhat similar lines, and the question had arisen how best to combat locally a form of competition they considered undignified and harmful to business on professional lines. It was not difficult to foreshadow some arguments that would be put forward in defence. They would hear the old cry of competition—a competition so great that it was held to be the only way in which men of push could get at a public growing indifferent to photography. Also, that the men conducting large establishments in London and the great provincial towns had not sufficient scope in their own districts, but must be fed from a larger area. The views of the meeting would be in unison to the extent that competition must be fierce and that the weakest would go to the wall, but an Association like the P.P.A. was concerned in something higher than the success or failure of individuals. It was a question of the ultimate good of the profession as a whole, and it was by regarding controversial subjects in that light that real and lasting benefit would accrue to it in these discussions. It was a matter of common knowledge that the practice of doing invitation work had extended until its gross abuse had become a reproach to professional photographers. Men and women of social or political eminence, or even of municipal fame, spoke of it as "the modern photographic torment," and it was easy to detect in the tone of the lay press a certain antagonism to camera work, probably due in a large measure to the cheapening of photographs by themselves and in their methods of doing business. Unfortunately there were men who regarded portrait photography much in the light of an ordinary retail trade, and who saw no discredit in soliciting and pressing their services unasked upon the public. While this was being done by the few no great amount of harm resulted, but the inevitable result of a competition which was momentarily successful was to produce an army of imitators, and to-day we had every class and no class of photographers vying with the originators of this business in pushing invitation work. Could they in Hull watch this going on unmoved? Could they allow strangers to come into their midst under various pretexts and interfere with the normal photographic demands of the district without taking some retaliatory action? And could any thoughtful person view the possibility of this happening all over the country without deploring the ruin to professional prestige which it threatened? The idea was growing that photographers would have to decide sooner or later whether it was better to be patient for a while, and attract to themselves by artistic effort and courteous treatment, building up and retaining, a real professional connection, or travel the miry path which led sooner or later to the slough of mediocrity awaiting men who weary under the rebuffs and contumely extended to them by a constantly solicited public. No one could deny that the effect upon the moral and business fibre of a man was injurious when he was unable to claim remuneration for his services, and it sapped the fertility of all high effort in business when the photographer was at the capricious mercy of his sitter. It was easy to ask the honour of a sitting, but the public was always on the look-out for the arrière pensée, and it was a serious mistake to arouse any suspicion of oversmartness. Photographers could not effectively employ the methods of ordinary trading in an artistic business. Then in proportion as a man revealed his dependence upon his neighbours, so was he held in esteem. Let him systematically beg favours either in social or business life, and he lost caste. The best policy was to convince our neighbours that they were wise in coming to us, that they paid a compliment to their friends in recommending us, that we are strong enough to do without running after them, and that we shrink from being regarded as uninvited nuisances. It was also our hope, our protection, against a continued and insane lowering of prices.

Mr. Ernest Elliott said he was glad to have this opportunity of meeting Hull photographers, and of learning their views on a question which had provoked a most interesting discussion at Russell-square. Both he and his father had the welfare and status of the profession generally at heart, and he sincerely hoped that any business activity on the part of Messrs. Elliott and Fry would not work any direct harm upon photographers either in Yorkshire or any other part of the country. He might perhaps mention with pardonable pride the share which Mr. Joseph Elliott had taken in the battle over copyright matters, and he hoped that the meeting would credit his family still with a keen desire to help in any movement which aimed at the improvement or consolidation of the professional photographers' position. He did not, however, think the opposition to the methods of his firm was quite justified. The fact seemed to have been overlooked that they depended largely upon publication work. Photographers in the country probably did not realise how important it was to the large publishing firms that their lists of public men should be kept constantly up-to-date. To attain this object such firms are obliged to invite, and the meeting would be aware also of the necessity of doing this in order to assure the retention of copyright in the portraits. He would in a moment or two give the history of his firm's operations in the country. Some few years ago practically the whole of the English school work was in the hands of a French firm, which was displaying extraordinary activity all over the provinces. Messrs. Elliott and Fry were reproached for allowing this, and, at the request of several people, undertook to compete against them. As a result the French firm had been driven off the field, and English photographers were now receiving the support of English schools. Of course, competition at home followed in its turn, and Messrs. Elliott and Fry, who had then established a regular system, took up military work in the camps: even this did not solve the difficulty of keeping the large outdoor staff employed during dull seasons and in the winter. Then just at that stage the copyright struggle commenced. The illustrated press had been accustomed to use photographers' work without thinking of paying for it. In the earlier days one photograph would be used, and possibly reproduced as a fine steel engraving with the photographer's name underneath. It was a good advertisement, and, although the photographer received no fee, he was satisfied with the arrangement. Then the half-tone block was introduced, and the papers were full of reproduced photographs, and still no monetary return to photographers. The necessity of photographic combination was day by day more evident, and at last the Copyright Union was started. The Union gave a great impetus to the publication trade, and it became worth while to make large collections of portraits of public men. To do this, photographers had to visit celebrities in the country, where, as a rule, they had more leisure, and so the system to which objection is being made had grown up. Photographers who did much publication work, and those who did little or none, would be unable to look at the matter from a common platform, but he admitted that competition was carrying the system of inviting to dangerous lengths. The difficulty would be to arrive at a decision as to what was reasonable and legitimate. Personally, he did not like invitation work, but there were factors in the problem which compelled his firm to do as other publication houses did in obtaining sittings. He hoped that the time was at hand when the P.P.A. would be able to arrive at some solution of an undoubtedly difficult problem. Mr. Elliott continued with a series of interesting remarks on the present attitude of professional photographers towards the illustrated press. He said the value of a good relationship was under-estimated by many photographers, who seemed to be under the impression that all editors were their natural enemies, and ready to do them injustice. No doubt the struggle for fair recognition had been severe, but now all papers of standing could be trusted for fair treatment if they were approached fairly, and in a proper business way.

Mr. Wellsted stated that the city of Hull was at the moment invaded by a battalion of men with cameras, who were systematically working down the streets photographing the shops. They did not even ask "the honour" of being allowed to perform the operation, but followed it up next day with proofs for one shilling. He was glad to learn that the shopkeepers were not greatly impressed so far, but it looked liked the realisation of the new business ideas suggested recently to the embryonic talent at a certain London photographic school.

After an animated discussion the following resolution was proposed by Mr. J. W. Shores (Bridlington), and seconded by Mr. M. Boak (Bridlington):—"That this meeting views with grave apprehension the growth of the 'invitation' method of procuring business, and is of opinion that the prestige of photographers is now suffering from the abuse of this system. It desires the London Committee of the P.P.A. to bring this subject up for discussion with the object of ascertaining the views of its members, and the possibility of persuading photographers to limit invitations to some recognised line."

The Chairman, in a brief summary of the proceedings, spoke of the indebtedness they felt to Mr. E. Elliott for the trouble he had taken to come so many miles to attend their meeting. At the same time, an explanatory defence always possessed a flavour of confessed guiltiness in some degree. Of course, the environment and vicissitudes of every man (in a great degree self-contributed to) influenced his action both in business and domestic affairs. Thus it was impossible to ever expect all men to think and act precisely alike. It was only by a system of mutual forbearance that life was possible.

Formation of a Liverpool Branch of the Association.

The following circular has been issued by Mr. A. F. Mowll (Messrs. Mowll and Morrison), of 45, Hardman-street, Liverpool:—"It is proposed to hold a meeting of the professional photographers of Liverpool and district, at the rooms of the Liverpool Amateur Photographic Society, Eberle-street, Dale-street (which have been kindly lent for the occasion), on Friday, 29th inst., at 6.30 p.m., to form a branch of the Professional Photographers' Association, at which it is hoped you will attend." We trust that the professional photographers of Liverpool, following the excellent example set by their brethren in London, Aberdeen, Hull, and Edinburgh will successfully launch a branch of the Professional Photographers' Association.

Recently Elected Members.

Brigham, William Dobson, 20, Esplanade, Scarborough.
Brown, Richard, 35, Bold-street, Liverpool.
Fry, Allen Hastings, Royal Pavilion Studio, 68, East-street, Brighton.
Inglis, Alexander Adam, Rock House, Calton-hill, Edinburgh.
Jancowski, Harry, 106, Anlaby-road, Hull.
Parkinson, William H., Grosvenor Studio, Newton-street, Bradford.
Penfold, Edwin Thomas (E. T. Penfold and Co.), Burwood House, Upper Tooting, S.W.
Smith, Randolph Edwin (Messrs. Smith Bros.), 7, St. Michael's-street, Malton, and 18, North Marine-road, Scarborough.
Unwin, Herbert John, 42, Commercial-road, Hereford.
Watson, Andrew Swan, View Park Studio, Bruntsfield Links, Edinburgh.
Watson, Frank, Cheltenham-road, Bristol.
Yerbury, Edward, R. (E. R. Yerbury and Son), 1, Hanover-street and 92, Morningside-road, Edinburgh.

Our Editorial Table.

Supplementary List of Lantern Slides for the Season, 1901-2.

Published by Newton and Co., 3, Fleet-street, Temple Bar, London, E.C.

The supplementary list of lantern slides issued by Messrs. Newton for the present winter season contains several attractive series. A set of 50 illustrates the voyage of the "Ophir" on the occasion of the recent Royal visit to the Colonies. A number of portraits of Royal personages and well-known people, as well as a set of art studies from negatives by Messrs. W. and D. Downey are included. Other sets illustrate such subjects as "Alfred the Great," "Wireless Telegraphy," "X-rays," "The Victoria Cross and our Soldiers," "The Paris Exhibition." In all there are sixty-eight sets listed in this supplementary catalogue, which should be in the hands of all those interested in up-to-date optical projection work for popular, scientific, and other purposes.

News and Notes.

Blairgowrie and District P.A.—At the monthly meeting on Tuesday, first and second place in the "Annuals" Competition were awarded to James Donaldson. Harold Baker's R.P.S. lecture on "Portraiture" was read, and thoroughly appreciated, as indicated in the interesting discussion that followed. The President (Mr. Geekie) presented "The Hundred Best Pictures" in portfolio form to the library of the Association.

Woolwich Photographic Society.—The annual social gathering in connection with this Society took place on November 21, and was well attended. The entertainment consisted of exhibits of lantern slides—the work of some of the members—musical reproductions on phonographs and gramophones, and vocal and instrumental music. A novel feature of the evening was the taking of a flashlight photograph of the assembled company, and its successful reproduction upon the lantern screen.

We are asked to announce that at the meeting of the Photographic Club, to be held at Anderton's Hotel, Fleet-street, on Wednesday, December 4, at 8 p.m., Mr. H. Snowden Ward will read a paper on "Photography for the Press." Any who are interested in the subject are cordially invited to attend. It may interest our readers to know that the Photographic Club has recently reduced its annual subscription from one guinea to 10s. 6d., a measure which, it is hoped, will attract many recruits to its membership roll.

Sir Clements Markham presided on Monday night at a meeting of the Royal Geographical Society, held in Burlington-gardens. Among the large company present were Sir Henry Bulwer, Sir Thomas Holdich, Sir Henry Howorth, and Captain Younghusband. At the commencement of the proceedings Dr. Vaughan Cornish exhibited some cinematograph pictures of the Severn Bore, which presented a remarkably realistic view of that phenomenon, and elicited hearty applause from the audience. Dr. Cornish stated that the films obtained were 150 feet in length.

The Photographic Club.—In accordance with a resolution passed at the annual meeting, the following letter has been addressed to Mr. Frank Haes:—"Anderton's Hotel, London, E.C., Nov. 6, 1901.—The members of the Photographic Club, assembled at their annual general meeting, desire to express their great regret that ill-health has necessitated the resignation of Frank Haes, Esq., F.R.P.S., as one of the Trustees, a position which he has occupied since 1889. They fully appreciate the great interest he has always evinced in the affairs of the club, and trust that, notwithstanding his enforced resignation, he will be spared for many years to give them the pleasure of his presence, whenever circumstances may render it convenient.—F. A. Bridge, H. Snowden Ward, Trustees; E. A. Newell, Hon. Secretary." The letter was beautifully engrossed and illuminated on vellum, bound in dark green leather, and was much admired when exhibited by Mr. Zaehnsdorf at the Club on Wednesday evening. The presentation was made at Mr. Haes' residence on Saturday last by Mr. F. A. Bridge and Mr. E. A. Newell. Mr. Haes was extremely gratified, and desired to thank the members most heartily for their good wishes, and especially Mr. Zaehnsdorf, whose generosity had enabled them to be presented in so elegant a form.

Animated Photographs of an Atlantic Liner en Voyage.—A matinee was given at the Alhambra Theatre on Saturday last by the Norddeutscher Lloyd Steamship Company to view a series of animated pictures recording the scenes and events of a trip to America by the company's newest ship, the "Kronprinz Wilhelm." This was the first voyage made by this vessel, which has a tonnage of 15,000 and engines of 35,000 horse-power. The pictures were taken by Mr. Urban. The record gives an idea of the experiences of a passenger America bound. The arrival of passengers at Bremerhaven, the point of departure, is shown, as well the approach to Southampton, where the vessel calls. Once out to sea, life on the liner is pictorially illustrated by views showing the promenade deck on a fine day and on a wet day, the officers taking observations, a concert, overtaking another liner, and others. The passage happened to be rough, and some excellent views of the waves breaking over the ship were secured by the operator. There are some good pictures of New York Harbour, and on arrival the passenger is taken ashore and shown Broadway on a fête day from the front of a car. Brooklyn Bridge is illustrated in a similar manner. By another picture of the water side of New York a good idea is given of the city's huge buildings. The return voyage by the "Kaiser Wilhelm der Grosse" is also illustrated.

The View from Richmond Hill.—Through the action of the County Councils the magnificent view from Richmond Hill is to be preserved to the public by the purchase of the Marble-hill Estate at a cost of seventy-two thousand pounds. In a letter to the "Standard" one day last week a correspondent called attention to the fact that this end will not be attained unless the Cambridge-house Estate is also secured. He says: "If this land is built upon, as threatened, the view from the Terrace gardens and the bridge, looking up the river, will be utterly ruined." He adds that he hears that plans are actually passed for the erection of villas on this estate. It would be a grievous pity that, after so great an outlay, as well as that for securing the little islands, the view should yet be marred by the erection of modern villas. But where is the money to come from to preserve it quite intact, it may be asked? It would almost necessitate the buying up of several counties. We do not remember, for the moment, exactly how many can be seen on a clear day from the hill—six or seven, we believe. Although the view from Richmond Hill is a favourite subject with artists, it, unfortunately, does not lend itself to photography. The view is too distant, and, moreover, is usually greatly obscured by haze. Still it is an enjoyable scene to view, and it is to be regretted that photography does not do it justice.

Hove Camera Club Exhibition.—The following is the award list:—Open Classes: Class A: Landscape, River Scenery, etc.—Silver medal, F. H. Read; bronze medal, C. F. Grindrod; certificates, C. Berrington Stoner and G. H. Capper. Class B.: Figure, Portraiture, and Animal Studies.—Silver medal, J. Page Croft; bronze medal, T. P. Padwick; certificate, J. Chaffin and Sons. Class C.: Architecture.—Silver medal, E. J. H. Felce; bronze medal, H. C. Leat; certificate, R. R. Rawkins. Class D.: Any other subject than Classes A, B, and C.—Silver medal, J. H. Whitehead; bronze medal, C. J. King. Class E.: Novices.—Silver medal, A. A. Elliott; bronze medal, E. J. Phillips; certificates, W. White Palmer and W. H. Foxall. Class F.: Lantern Slides, Landscapes, etc.—Silver medal, Graystone Bird; bronze medal, R. Warden Harvey; certificate, Frank H. Read. Class G.: Lantern Slides, Portraiture, etc.—Bronze medal, E. R. Bull; certificate, Graystone Bird. Class H.: Lantern Slides, Architecture, etc.—Silver medal, G. Hankins; bronze medal, Dr. J. W. Ellis; certificate, E. R. Bull. Club Classes.—Challenge salver, Mrs. A. O. Jennings, "A Study," Class J.: Landscape.—Silver medal, R. C. Ryan; bronze medal, F. R. Richardson; certificate, Victor, E. Morris. Class K.: Marine.—Silver medal, C. Berrington Stoner; bronze medal, F. R. Richardson; certificates, R. C. Ryan and W. White-Palmer. Class L.: Portraiture.—Silver medal, Mrs. A. O. Jennings; bronze

medal, F. R. Richardson; certificate, A. R. Sargeant. Class M.: Architecture.—Bronze medal, A. R. Sargeant; certificate, D. J. Gadsby. Class N.: Lantern Slides.—Silver medal, D. J. Gadsby; bronze medal, A. R. Sargeant.

"Halos."—"There is a delightful sentence in the Religious Tract Society's advertisement in one of the Church papers. The Society, referring to its religious prints for Sunday or day schools, says 'There are no halos.' The Society, it seems to me, is justified in making a feature of this omission. The world to-day has gone halo mad. The moment a man or woman in any walk of life has done something not quite ordinary, he or she is instantly adorned with a halo, and is henceforward never allowed to appear without one. The Plague of Halos has taken hold of modern journalism and the modern public. Our generals and our actresses share the common halo of the cigarette photograph; our men of science and our divines are haloed by the interviewer and the newspaper on the slightest provocation. There are even literary men and journalists who adorn themselves with the halos of the dead. Some wear the Stevenson halo, others the Omar Khayyám, some go haloed all their lives because they talk of Dr. Johnson. A little girl at a music-hall sings a taking song, and a hundred paragraphists and a score of photographers instantly adorn her with the halo of celebrity. A young fellow under age marries in spite of his Mamma's displeasure, and the halo of romance is his for a month. A popular weekly periodical will presently be haloing its two-thousandth 'Celebrity of the Day.' The wife of a working-man mayor wears a halo because she cooks her children's dinner. The rich American in London is haloed because he spends his money. East and West and North and South there seethes a haloed crowd. At some of the fashionable restaurants any one who orders a meal is haloed by the Society paragraphist. There are pauper centenarians in the workhouse who sleep in their haloes; there are messenger boys who go errands in theirs. There will presently be only one way to be distinguished above your fellows; that way will be to go through life quietly, modestly, and haloless."—"Dagonet" in "The Referee."

Bromide of Potassium and the Supernatural.—Last week Sir T. Lauder Brunton read a paper before the Medico-Psychological Association at their rooms in Chandos-street, Cavendish-square, on "Fairies, Apparitions, Visions, and Hallucinations." He drew attention at the outset to the fact that there was considerable variation in the acuteness of the senses of different people. Thus some persons perceived blue flames in the fire in winter and some persons heard the shrieks of bats, whilst others were sensible of neither. In the same way he believed that there were people who felt things which others could not feel. Referring to wireless telegraphy, he said that since this discovery he had begun to think there might sometimes be such a relationship between men's brains in far distant localities that one might act as the receiver and the other as the transmitter. This theory seemed to offer just a possible explanation of certain things which he saw no other way of explaining. Apparitions, he said, were probably due to abnormal conditions of the apparatus required for the reception of external impressions; and he gave instances due to the state of the eye or brain, one of his illustrations being taken from the case of an epileptic patient who believed he saw a man wearing a brown coat sitting in his chair when he reached home. He once went to see an exhibition of howling dervishes, who moved their heads, with the hair flowing, in a figure of eight, until they fell down in an epileptic fit. In the account of Samson we seemed to have an account of an epileptic maniac, and here again the waving of the hair appeared to play an important part. Epilepsy was connected in the minds of psychologists with migraine. He believed the vessels inside the brain capable of contraction, like those outside, and in that case we should get anæmia of parts of the brain and consequently affections of vision, hearing, smell, and taste. In many people migraine was preceded by a vision of zigzags, rather like a procession. We found a troop of spirits in this form in Doré's illustrations to the "Inferno." He thought it not unlikely that both Dante and Doré suffered from headache of this kind. He thought that sometimes probably we had visions without pain, and he was inclined to think that stories of fairies might partly be referred to them as well as to the aboriginal race mentioned by Professor Reece. Speaking of Mahomed, he described his visions, trembling fits, and convulsions, and said it was curious to speculate how different might have been the course of the world's history if the prophet had been thoroughly dosed with bromide of potassium.

The Cambridge Convention.—On Tuesday evening, Nov. 19, a meeting of the Local Committee of the Photographic Convention of the United Kingdom (which will be held at Cambridge next year) was held at the Liberal Club, and was well attended. Mr. T. H. Sanderson, the Chairman of the Committee, presided, and he was supported by Mr. H. A. Chapman, Hon. Secretary pro tem. Mr. F. A. Bridge, the Hon. Secretary of the Convention, also attended to give the local members any advice they wanted with regard to the working of the Convention. The principal work of the evening was in electing a Secretary and some Sub-Committees. Prior to this, however, the names of Dr. Dufton, Messrs. G. H. Tyndall, C. E. Goodrich, J. Scott, and C. S. Addison were added to the General Committee. Mr. H. A. Chapman's name was the only one suggested for the post of Secretary, and, on being put to the meeting it was carried unanimously. The Chairman thought that that was a step in the right direction, as Mr. Chapman took up the work at the commencement, and showed himself to be suitable for it. The place at which the Convention is to be held has the privilege of nominating five members for the General Council, and the names accepted were Dr. Dufton, Messrs. G. H. Tyndall, C. R. Goodrich, J. Scott, and C. S. Addison. Four Committees were then elected, with power to add to the number of members on them. The Reception Committee was said to be more of an honorary affair than anything else, and for this the names of most of the more influential gentlemen in the neighbourhood were set down. The Accommodation Committee was elected for the purpose of compiling a list of hotels and lodging-houses available for the visitors, and of the most suitable objects to photograph. The members elected for this Committee were Dr. Bansell, Messrs. Fred Stoakley, W. F. Taylor, H. Stearn, J. Scott, and W. Butcher. The name of the Excursion Committee implies its object. The following were elected on it:—Dr. Dufton, Messrs. G. H. Tyndall (Ely), F. W. Bird, W. F. Taylor, W. Butcher, John Johnson, and T. B. Hunt. The work of the Dinner and Entertainment Committee is also obvious. This will consist of Messrs. W. B. Redfern, C. E. Goodrich, Stanley Johnson, E. Field, E. S. Peck, F. Stoakley, W. F. Taylor, C. S. Addison, H. J. Dew, J. Leach, J. Scott and Drs. Bansell and Dufton. Mr. Bridge said that the Convention started officially on the Monday evening, when the Mayor would introduce the Convention to the town, and the President (Sir Robert Ball) would give his presidential address. On Tuesday they would have a long day excursion, with no evening meeting. On Wednesday there would be the annual general meeting at 10 o'clock to elect the new Council, and at 11 o'clock the Council meeting would be held. After that they had the group taken, one person being specially selected for that purpose. On Wednesday night they had the annual dinner. On Thursday and Friday excursions would be held, and meetings in the evening, and on Saturday they would arrange another short excursion. The question of excursions was discussed, and amongst the places suggested were Ely, St. Ives, Bury St. Edmunds, Audley End, and Saffron Walden.

Commercial & Legal Intelligence.

The Luxia Papers.—Writing from the South-hill Works, Hampstead, London, N.W., the Luxia Company ask us to state that a copy of their pamphlet containing complete price lists of all the "Luxia" photographic printing papers, and full instructions for making same, will be sent post free to any address upon application.

Mr. Ernest Human has undertaken to demonstrate S.C.P. before the London and Greater London photographic societies, and secretaries should at once write for a date, and thus fill at least one of those vacant nights on their programme. His address is 10, Whitta Villas, Whitta-road, Manor Park, Essex.

The Teb Competition.—We are asked to state that the success of the "Teb" Photo Christmas Card Competition has been very great. There is hardly a country in the world which will not be represented in this competition, if prints are sent in from all those who have purchased cards. The promoters have acquiesced to a request made by a number of Colonial friends who drew attention to the unfairness of closing the competition so early as at first arranged. The date fixed for receiving prints has now been somewhat extended, and the competition will definitely close on December 24.

The adoption of the metric or decimal system of coinage, weights and measures in South Africa was advocated by Mr. Hutchins in a paper read before the South African Philosophical Society on October 2. It was shown that with very slight modifications the present coins and measures could be adapted to the decimal system. At the close of the meeting it was decided that a committee, consisting of Sir David Gill, Dr. Muir, D. Beattie, Prof. Thomson, Dr. Crawford, Mr. Littlewood, and Mr. Hutchins (with power to add to their number), should prepare a report on the advisability of introducing or legalising the metric system of weights, measures and coinage in South Africa.

Re Automatic Photoscope Syndicate, Ltd.—This action came on for hearing in the Lancashire Court of Chancery, before Vice-Chancellor Hall, K.C., and was a petition to wind up the company, which was incorporated in May, 1899, having its registered office at 10, Norfolk-street, Manchester. The nominal capital of the company was £25,000, divided into 25,000 shares of £1 each; the amount of capital credited as paid up being £19,284 5s. Mr. Maberly (instructed by Messrs. Parker and Ayre) appeared in support of the petition, and Mr. Roby and Mr. Atkins appeared on behalf of creditors and contributaries. Mr. Maberly said that the company was unable to pay its debts. All parties consenting, the Vice-Chancellor granted an order in the terms of the prayer of the petition.

The third Photographic and Optical Trades Exhibition will be held in the Portman Rooms, Baker-street, London, W., April 11 to 19, 1902. The prospectus states that the optical trade is so closely allied to the photographic industry that it has been decided to add a section for optical exhibits. This will not prevent photographic firms from exhibiting optical instruments on their stalls in various parts of the exhibition if they should desire to do so; but a special section will be offered to purely optical firms for the exhibition of spectacles, folders, field, marine or opera glasses, binoculars, telescopes, microscopes, in fact, all kinds of optical instruments and apparatus connected with their manufacture. All letters and inquiries concerning the exhibition should be addressed to the Secretary, Mr. Arthur C. Brookes, Harp-alley, Farringdon-street, London, E.C.

The American Invasion.—There is needless alarm in some quarters over the American invasion. It is forgotten that we are always invading other people in just the same way. In every corner of the globe British capital is invested and British enterprise is directing all sorts of industries.

But we forget to be equally enterprising at home, and the Americans have found it out. For our own part, we welcome their co-operation. The stay-at-home Englishman has a very great deal to learn, and, as his fine insular superiority prevents him from learning it by inspection of what others are doing, the best thing possible for him is that other people should come here and do things under his nose. Besides, if one thinks of it, the Americans really owe us a good turn of the sort. We built many of their railways for them, and lost no small amount of money by the operation. It is only fair that they should energise our operations a little, though we have no desire in the world that their experience here should be as unpleasant as that of many a British investor in wild-cat lines over the water. They are really doing very well just now. They are setting up a magnificent electrical factory in the north; they are pushing that electrification of the Underground which has been promised so long; they are interesting themselves in "tubes"; and the account we publish to-day of the new telephone service in London shows that American ideas and methods are largely recognised in that department. This country has done a great deal to shake up the world, but in its domestic affairs it needs a good deal of shaking up itself. It is a brotherly thing for the Americans to give the requisite fillip, and, in addition, increased community of interest cannot fail to draw the Anglo-Saxon nations closer together.—"The Times."

A Word for Trade Papers.—If you value your position in your district, do not begrudge the amount of a subscription to one of the papers published in the interest of your business. Whether you be chemist, draper, ironmonger, tailor, grocer, undertaker, or anything else, this applies to you. Just think a moment. A trade paper sets itself to gather in the loose threads represented by the dealers in a certain line of business, and, keeping a hold on these threads, comes into touch with all the ins-and-outs of the trade. This makes the conductors of the paper much better informed than any individual member of the trade can be, and for the subscription they place the information they thus gather at your disposal and service. "But how is it going to affect me?" some of my readers may ask. Just this way. The paper, if it is worth its salt, constitutes a record of what is being done in the big houses of the trade, and tells of the movements on foot and in hand to achieve certain ends, and notes the state of the trade in the big business centres. Now, these three things in themselves from an invaluable mine of information to the man who has any brains at all, and he should set himself to emulate the examples set by his big brothers, watch the movements which may threaten or foster his interests, and observe and reflect upon the ascent or descent of the trade thermometer. It is almost unnecessary to point out that the man who by this means keeps himself posted in the doings of his neighbours and (this is of paramount importance) condescends to mark, learn, and inwardly digest the pointers thus placed before him, not only stands a better chance of success, but is practically on the road to a rich reward. A word finally: do not, therefore, poohpooh the idea of taking in a trade paper, nor ignore it because of its subscription; for the simple reason that others, more far-seeing than yourself, who subscribe to one of the papers that represent your business, will certainly push you out of the line of competition, if you deprive yourself of the knowledge that is offered you. It is to your own advantage that you be on a level with your fellows.—E. V. Henson in "Progressive Advertising."

Cyanide Poisoning.—At the Westminster Coroner's Court last week Mr. John Troutbeck held an inquiry into the circumstances attending the death of Folke Bjorkegrin, aged 31, a shipowner, of Stockholm, who committed suicide by taking cyanide of potassium at the Kensington Palace Hotel. Messrs. Trinder and Capron, solicitors, watched the case on behalf of the widow. Mr. Norman William Shairp, a Baltic merchant, of 25, Sinclair-gardens, West Kensington, identified the body of the deceased as that of his son-in-law, who, he said, was a Swede. He married witness's daughter on the 6th inst., and stayed with his wife first at the Buckingham Palace Hotel, then at the Imperial Hotel, Torquay, and lastly at the Kensington Palace Hotel. Frederick Bailey, night liftman at the Kensington Palace Hotel, said that when he took Mr. Bjorkegrin up in the lift at midnight on Saturday he seemed quite as usual and in good spirits. Subsequently Mrs. Bjorkegrin rang the bell, and asked witness for a sheet of paper and an envelope, remarking that her husband had been taken ill, and that she wanted a doctor. Joseph Henry Collins, a chemist, of 118, Holland-park-avenue, Kensington, stated that at midday on Saturday Mrs. Bjorkegrin, whom he had known for three or four months as a customer, came and purchased some films and an ounce of cyanide of potassium. She said she wanted the cyanide for intensifying purposes, for which it was frequently used. The Coroner: Not by amateurs, surely?—Oh, yes. The witness added that the lady signed the poison-book in the name of "Shairp." He labelled the bottle "Cyanide of potassium—Poison." The Coroner (examining the poison-book and the bottle).—Yes, I see everything is in perfect order. Dr. Frank Harrison Lowe, of 12, Sinclair-gardens, S.W., said he was summoned to the hotel and found the lady pacing up and down the corridor, awaiting his arrival. She said she was afraid her husband had taken some poison. In the inner of two rooms he found Mr. Bjorkegrin dead in bed, and a bottle from which about a quarter of an ounce of cyanide was missing was discovered in the room. Mrs. Bjorkegrin then made a statement to him as to her married life. The lady further informed the witness that earlier in the evening she handed the deceased the bottle of cyanide to put in his luggage, and that shortly after he had retired to his room she heard him groaning. She at once ran to his assistance, and he told her that he was very ill. Mrs. Margaret Eliza Bjorkegrin, the widow, stated that the account given by Dr. Lowe of his interview with her was absolutely correct. She signed the poison-book, as stated by the chemist. It was at the request of her husband that she purchased the cyanide of potassium. The Coroner said he was of opinion that the widow's action in sending for two doctors was thoroughly consistent with the conduct of a perfectly innocent and straightforward person, and her statement as to her husband's illness had been borne out to the letter. The jury found that the deceased committed suicide when he was not responsible for his actions and whilst temporarily insane.

A Notable Camera.—Messrs. Penrose & Co. have just completed for the Indian Government Survey Office, at Calcutta, a photographic outfit which has been described by every one who has seen it as simply magnificent. The term may apply not only to the size, but also to the quality of the apparatus. The camera is for wet-plate work up to 42×32 inches, and is constructed throughout of the finest picked Spanish mahogany of 1 inch thickness in the bodies and two layers of 1½ inch thickness in the base. Every joint and corner is thoroughly bound with inlaid brass plates. The bellows are in four sections, and are of the finest red Russia leather, which is the only material that will withstand the depredations of the white ant, an insect which speedily destroys any ordinary leather bellows. For the same reason the internal woodwork and the stand, to be presently described, is made of teak. The whole camera and stand measures 10 ft. ×5 ft. 6 inches all over, and has a height of 6 feet from the floor. Its weight is over a ton. The front body of the camera is a fixture, and the focussing is done by means of a steel screw of 1 inch diameter operating on a heavy gun-metal nut bolted to the back body. The focussing handle is made detachable, so that the camera when once focussed cannot be tampered with by the native helps. The middle and back bodies run on brass friction blocks sliding on round steel rails, let into the base, and the bodies are kept down on the rails by iron plates, with adjustment for wear, in an undercut metal-lined groove. This construction has ensured great rigidity, squareness and parallelism, whilst working very smoothly. The frames supporting the centre of the bellows to prevent sagging, have grooved brass wheels running on the same rails as the bodies. The ground-glass frame and dark slide, either of which requires two men to lift it into place, are attached to the camera by a heavy pattern of the spring catch. By this arrangement the bottom of the frame is dropped on to conical points on projecting plates at the bottom of the camera, and then pushed against the catches at the top, which spring into place automatically. Heavy brass handles are provided on the frame and slide for lifting. The ground glass is in a separate inner carrier, which is provided with a lateral displacement for centering the picture in a horizontal direction according to a datum line for accurate measurement. This is to facilitate the correction of slight inequalities of scale in drawing. The dark slide is of a double-bar pattern, holding various sizes of plates without carriers. The bars are of teak with standard silver stop plates riveted on with silver wire. The door is divided into three panels, and is provided with heavy leather handles. The roller shutter has strips of steel let into it before the interior cloth covering is put on. The whole camera is finely French polished. The stand is provided with a levelling adjustment, operated by a screw, also a longitudinal movement for the camera. There is further a cross traverse operated by a heavy brass rack and pinion. Both the screws and pinion rod are actuated by the handle, which detaches from the camera, so that here again there is no possibility of the setting being disturbed once it is made. The stand is strongly constructed, chiefly of 3×3 in. teak, bolted together by steel screws. The tray which supports the camera is on a central trunnion to permit the levelling up by means of a wedge frame, operated as already stated by means of a screw. The stand is nicely varnished and has a fine and massive appearance. The lens for the camera has been specially constructed by the firm of Carl Zeiss, of Jena, and is of the Series V. type, of 51⅜ inches focus, working at an aperture of 1:18. It is provided with a prism and rotating flange for setting the same. The prism is about 5×5 inches on the faces. They are also supplying with the camera two printing frames of equivalent size, in which the pressure is furnished by means of a pneumatic cushion inflated by a pump. Very perfect contact for photo-litho paper or thin litho-zinc is obtained by this means. An ebonite tray for the silver bath is another feature of the outfit. The whole equipment has been arranged to the instructions of Mr. T. A. Pope, the Assistant Surveyor-General, and will be worked by Mr. Haward, chiefly for full-scale map work.

Patent News.

The following applications for Patents were made between November 11 and November 16, 1901:—

Stereoscopes.—No. 22,692. "Improvements in Stereoscopes." Siegfried Ledérer.

Camera Front.—No. 22,694. "A Folding Front for Cameras." George Arthur Pickard and Henry Percy Tattersall.

Plates and Papers.—No. 22,727. "Improvements in the Manufacture or Production of Photographic Plates and Papers." (Communicated by the Farbenfabriken vormals Friedrich Bayer & Co., Germany.) Henry Edward Newton.

Squeegees.—No. 22,798. "Improvements in 'Squeegees' for Photographic Purposes." Complete specification. John Wilkinson and Alfred Wilkinson.

Plate Boxes.—No. 22,850. "Improvements in Photographic Plate Holders or Boxes." Alfred Wagner.

Printing Frame.—No. 23,031. "An Improved Photographic Printing Frame." Fred Woollons.

Natural Colour Photography.—No. 23,081. "An Improved Method of producing Natural Colour Pictures on Paper or other suitable Substances by Means of Photographic Bas-reliefs." William Norman Lascelles Davidson and Benjamin Jumeaux.

Lantern Screen.—No. 23,105. "Improved Screen to be used in the Projection of Pictures or Views." (Communicated by Auguste Lumière and Louis Lumière, France.) Benjamin Joseph Barnard Mills.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
2	Camera Club	*The Story of Gothic Detail.* G. A. T. Middleton, A.R.I.B.A.
2	Glasgow and West of Scotland	Technical Meeting. Demonstrations: *Carbon Printing*, J. W. Downs; *Platinotype*, A. J. Kay.
2	Oxford Camera Club	*Factorial Development.* Claude Rippon.
2	South Manchester	Exhibition of Members' Work.
3	Stonehouse	Annual Meeting and Exhibition of Members' Work.
3	Thornton Heath	Lantern Night: Members' Slides.
4	Borough Polytechnic	A Chat by the Rev. F. C. Lambert, M.A.
4	Croydon Camera Club	Lantern Lecture: *Stops.* F. O. Bynoe.
4	Edinburgh Photo. Society	*The Arts of Engraving.* J. Craig Annan, F.R.P.S.
4	Photographic Club	*Photography for the Press.* H. Snowden Ward.
5	Brentford	Lantern Slides.
5	Liverpool Amateur	Demonstration: *Bromide Printing.* Fred Anyon.
5	London and Provincial	Paper by A. Mackie.
5	North-west London	Social Evening.
5	Richmond	Lantern Evening: *Venice.* J. H. Gear.
5	Rodley, Farsley, and District	*Stereoscopic Photography.* J. Taylor.
6	Borough Polytechnic	Instruction Evening: *Lantern Slides, Production of Tones.* F. W. Gregg.
6	Leicester Literary	Demonstration: *Manufacture of Bromide Emulsion for Lantern Slides and Opals.* H. Pickering.
6	Plymouth	*The Difficulties encountered in the Earlier Stages of Photography.* E. G. Turney and A. W. Hicks.
6	Sutton	*Trimming and Mounting Prints.* W. C. Marshall.
7	Thornton Heath	Lantern Lecture: *A Trip to the Alhambra (Granada) with a Hand Camera.* R. Child Bayley, F.R.P.S.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 21,—Mr. J. A. Randall in the chair.

Mr. P. Everitt said that the firm of Steinheil, of Munich, had been exhibiting some things at the meeting of the British Astronomical Association the night before, and amongst them was a prism which he thought of sufficient interest to bring up to this meeting. It was a prism used for the examination of fluids spectroscopically. The prism was drilled through the centre, so as to form a hollow chamber for the reception of the fluid, and the top was also drilled through as far as the inside chamber to facilitate the introduction of the fluid to be examined. The top opening was closed by means of a stopper, or it could be used for the introduction of a thermometer to take the temperature of the liquid. The central chamber of the prism was closed at the two sides by means of pieces of plain parallel glass plates, which may be otherwise described as glass plates whose sides are perfectly flat and parallel one to the other. These glass plates are simply pressed into contact with the similarly true surfaces of the prism. Hand-pressure brought about such close contact between the prism and the glass plates that, without any cementing, they adhered to one another with great tenacity. It was not easy to remove plates once attached in this way. The method was to bring the prism sharply towards a source of heat for a moment, when the glass plate would "spring" off. The prism could be used for testing all sorts of fluids. It was combined with the slit on one side and the telescope on the other; the light passed through the fluid, and with the scale one read off the differences in the refractive indices, etc. By means of a "flat," he showed that the surfaces of the side plates were perfectly true.

Mr. J. E. Hodd said that he rarely did any work with other than rollable films. He had brought up some films which he looked upon as further evidence that their keeping qualities were remarkably good. The spool was made apparently about June, 1898, and the negatives which were only recently made showed that the film was in perfect order, and none the worse for keeping some three years and a quarter. The exposures were one-fifteenth of a second at f-8 at the end of August.

Mr. A. Mackie remarked that bromide papers in rolls were found to keep better than in cut sheets, and, inferentially, that the same might apply to roll and cut films.

Mr. J. E. Hodd showed an instrument called the Dawson Densitometer for gauging the proper exposure for bromide paper. The negative whose density is required to be classified is slipped into a slot in the front of the instrument, and with its portion of greatest density, the details of which are required to print, opposite the circular opening in the front of the slot. The densitometer is held about 18 inches from the eyes towards any light sufficiently strong to illuminate a certain screen through the negative. A diaphragm is then turned until two screens are seen to be equally illuminated, when the number on the top of the diaphragm will indicate the comparative printing density of the negative, and the necessary exposure will be found by reference to tables in a book supplied. A set of exposure tables for every brand of bromide paper is issued. Mr. Hodd said that it seemed to be a very practical device, although, of course, the idea was not new.

Mr. E. Human reminded the members that some twelve months ago he read a paper on the after-manipulation of carbon prints, in which he described a method of staining with aniline dyes. The matter has been taken up in this JOURNAL, and some doubt regarding the permanence of this form of colouring was expressed. Mr. Human had not claimed, however, that they would be permanent. He now showed the illustrations used on that occasion again. They had been uncared for ever since, and had been exposed to strong daylight. The only colour that had faded was the blue, and that was known to be fugitive. That being so, however, one still had the original carbon image unaltered.

Mr. J. W. Hodges gave a very interesting and well-considered paper on "Wells and District," in which he made a strong plea for the county of Somerset as a field of work for the photographer. No county, he held, could be more attractive to the photographer, whether architectural, pictorial, or antiquarian. With some excellent lantern slides in illustration, he proceeded to discuss the architectural details of Wells Cathedral, Glastonbury Abbey, etc., finishing with some views of Cheddar, Cheddar Cliffs, the stalactite caves, and so forth.

Mr. R. Beckett also showed some photographic slides of articles recovered from Pompeii, views in Florence and its churches.

PHOTOGRAPHIC CLUB.

NOVEMBER 13,—Mr. G. W. Wynne in the chair.

Mr. T. W. Derrington gave a lecture upon

STEREOSCOPIC PHOTOGRAPHY.

The subject was one that most old photographers knew a good deal about, but it was one that, owing to various causes, was little known to the modern photographer, and the process was, in fact, supposed to be dying out to a great extent. If that were so, it was almost a calamity, but he was glad to see that a revival had lately taken place, and that this beautiful branch of the art was destined to remain with us for some time. He believed that one reason for the want of popularity that the process stagnated under was to be found in the general idea that it was a difficult process, but any difficulties that might attach to it disappeared if one adopted but a little system in one's work. The theory of binocular vision required a little attention at the outset. The camera in too many instances was compared with the eye, but there were two important differences. The eye consisted of thre parts—the crystalline lens which formed the image of an object, the ciliary muscles attached to it for its control, and the retina, equivalent to the focussing screen of the camera. Supposing the eye to be directed to a near object, an image of this object is focussed sharply upon the retina, and so also in the case of a distant object. This is effected, not as the camera would do it, by racking out or in so as to modify the distance of the lens from the screen, but by an alteration of the curves of the crystalline lens through the medium of the ciliary muscles, and a consequent alteration of its focus. The retina did not move, nor did the lens in its relation to the retina. There were several theories of binocular vision, but no finality seemed to have been reached. Each eye, it must be understood, embraced slightly differing views, as could be proved by holding up one's finger and closing alternately each eye. The finger would be seen to fall on different parts of the background in each case. The left eye saw a little more of the left side of an object, and the right a little more of the right side. The combination of the two views gave the idea of solidity, or of the distance between various planes. The whole aim of stereoscopic photography was to enable the eyes to see as nearly as possible in a picture as and what they could see in nature. Atmosphere, distance, depth, solidity, etc., appeared in a stereoscopic photograph to be actual, whereas in a monocular picture no skill could introduce them successfully. It was very commonly supposed that the two prints that composed a stereoscopic photograph were identical prints from one negative mounted side by side. Nothing could be more incorrect. It had been claimed that by an arrangement of mirrors it was possible to secure the stereoscopic effect from a single print. Again, nothing could be more incorrect. There was a certain semblance of a stereoscopic effect to be obtained by looking with one eye at a monocular photograph from a point approximately at the focal length of the lens used in taking it, and some people maintained that in this way they could ascertain the focal length of the lens used in taking a given picture. The ordinary quarter-plate camera could be used, by combining with it a tripod head that permits of a sideways movement of the camera for the taking of the two dissimilar views. A half-plate camera could be used, and the two views recorded on one plate, a dividing partition being required inside the camera. Any method based on the use of one lens, however, with two separate exposures, barred moving objects. The best method was that in which a pair of lenses on one camera was employed. Ordinary landscape lenses, giving distortion of straight lines near the margin of the field, were better in the opinion of some workers than the rectilinear, especially if the stereoscope used has lenses short in focus, because the distortion of the taking lenses was corrected or neutralised by the viewing lenses. He preferred the lenses to be of about 5 in. or 6 in. focal length. Lenses of slightly different focal length could be used, but it was important that the lenses of each pair should be as nearly alike as possible. The size of one's prints were limited in their base-length by the separation of the eyes, but they could be of any vertical measurement. The square print seldom made an effective picture. It was easier to say what was not suitable as a subject for the stereoscopic camera than what was suitable. Almost any subject lent itself, more so than in monocular work, but one required several planes and some near objects to produce the best effect. A panoramic view was probably the most unsuitable, the details being too distant. For landscapes a separation of the lenses of about 3 inches was most suitable, but things like vases of flowers would be exaggerated unless the lenses were brought much nearer one another. Exposure should be more generous than in mono-

cular work, but development should be carried not too far. Printing, again, may be carried farther than for ordinary prints. The lecturer showed a large number of examples, which were examined in the Club's stereoscope.

Croydon Camera Club.—Messrs. W. H. Rogers and L. G. Kough gave a joint demonstration of the carbon or autotype process on Wednesday, 20th inst., at the weekly meeting of the above Club, which attracted a large attendance of members. Carbon or pigment printing may be said to date from 1864, the first practical method being due to J. W. Swan. Since then improvements have been effected notably by J. R. Johnson, and the process has become increasingly popular with photographic workers owing to the variety of colours that can be obtained and permanency of results. Mr. Kough demonstrated the autotype tissues printed from glass negatives, and dealt ably with the subject in a thoroughly practical manner, some capital photographs (15×12) being developed in the hot water tank. Equally successful was Mr. Rogers in using the Illingworth tissues. These were printed from enlarged negatives on smooth bromide paper. The results obtained by Mr. Rogers were in every way excellent, and the grain of the paper, which might have been expected to show on the print, was not apparent. During the evening a special form of calcium box, recently introduced by the Autotype Company, was handed round. In this the sensitive tissue can be kept without deterioration for three months at least, and quite flat. Under ordinary conditions its keeping properties are limited to ten days or a fortnight. The introduction should prove a boon to the occasional worker. A portrait study by the same company in carmine, a beautiful new colour, was also shown. Its support consisted of a thin aluminium sheet, having all the sheen of satin. Messrs. Illingworth showed amongst others a portrait study printed in lilac purple, which is novel and not unpleasing. Mention should also be made of a single form of print meter for gauging exposure, due to Messrs. Illingworth. At the conclusion of the demonstration the President (Mr. Hector Maclean, F.R.P.S.) moved a vote of thanks to the above gentlemen, which was seconded by Mr. Bynoe, and carried in a hearty manner.

North Middlesex Photographic Society.—Nov. 20,—Mr. R. R. Rawkins gave a demonstration on "Bromide Paper." He showed prints from the same negative on different grades of bromide paper to illustrate the various surfaces obtainable, and also of different colours, some obtained by development and others by toning with copper, uranium, hypo and alum, and ferricyanide. In dealing with the manipulation, he said that plenty of yellow light should be used, and the appearance judged by looking through instead of on the surface of the print. A strong print from a weak negative may be obtained by printing at a distance from the light with proportionately increased exposure, and conversely a dense or hard negative should be held close up to the light. The developer he recommended was amidol, the formula being:—10 per cent. solution of sulphite of soda, 1 ounce; water, 5 ounces; amidol (added just before using), 20 grains; potassium bromide (if required), 1 gram. The bromide is not required unless the development is too rapid for convenience. He developed several prints successfully.

West London Photographic Society.—At a meeting held on November 15, the Hon. Secretary gave a demonstration of the carbon process by single transfer, and laid special emphasis upon the ease and simplicity of the operations. He recommended Burton's actinometer and the Autotype Company's new storage tube. By the use of this latter the sensitised tissue could be kept in good condition for months, either before or after printing.—On November 22, Mr. Leslie Selby demonstrated his method of working the various gaslight development papers. Using a simple hydroquinone developer, he obtained black tones with normal exposures, and various colours, from warm black to red, were got by lengthening the exposure without any alteration or addition to the developer, which could be used over and over again.

FORTHCOMING EXHIBITIONS.

1901.

November 29, 30 ..... Glasgow Eastern Amateur Photographic Association, 12½, Landressy-street, Bridgeton, Glasgow. Hon. Secretary, G. R. Johnstone, 166, Slatefield-street, Dennistoun.

December 3–7 ..... Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.

Dec. 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

„ 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.

1902.

February 13–15 ..... Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries: W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell Hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.

February 15–Mar. 8 Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.

„ 19–26 ..... Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

"OUR PRESENT ATTITUDE TO THE PROFESSION."

To the EDITORS.

GENTLEMEN,—In face of your present attitude to the profession, and the correspondence re terms in your JOURNAL, we trust that you may comment favourably on the enclosed circular.—We are, yours, &c.,

The "Gem" Dry Plate Co., Ltd.,
T. E. H. BULLEN, Managing Director.

92A, Villiers-road, Willesden Green, London, N.W., Nov. 22, 1901.

[The circular enclosed with our correspondent's letter relates to terms for plates and papers to members of the Professional Photographers' Association. Our "present attitude to the profession" is exactly the same as it has always been. In the JOURNAL of May 7, 1897, we closed a correspondence on the subject of "Prices and the Association of Manufacturers" with the following remarks:—"We have received many other letters on this subject from professional photographers, but as they are practically repetitions of those already published it is needless to continue the correspondence, which we here terminate. We should be exceedingly pleased to know that the expressions of opinion made public in these columns had induced the Association to place the professional, and especially the very small consumer, on a more favourable footing than he at present occupies." Thus it can be seen that our "attitude towards the profession" has undergone no change whatever between May, 1897, and November, 1901. EDS. *B.J.P.*]

THE DISCOUNT QUESTION.

To the EDITORS.

GENTLEMEN,—Your correspondent in the last issue of the JOURNAL expresses a hope that I do not wish to see "cut prices" introduced into the photographic trade. I wish no harm to any one, but I do wish to see fairness to all parties. I do not see why capital and business habits should be deprived of their proper sphere, nor do I see why a dealer should be prevented from managing his business in his own way. Why should there not be free trade in this matter? If a large dealer purchases his goods at a price less than will give him a fair profit, why should he be prevented from taking such steps as he chooses, in order to draw to himself as large a circle of customers as he can? and why should he not be allowed to exercise his judgment as to the means he takes to do this? Your columns contain many advertisements which are one mode of attracting custom, and indeed in many cases the cheapness of the goods and the gain in that respect by dealing with certain establishments is freely set out. Is all this advertisement and competition illegitimate? Are prices properly settled by a committee of manufacturers with power to enforce their decisions, and is all competition to cease? Because I fail to see why photographic plates and paper are alone to have their prices regulated in this way. Why should not the price of cameras, etc., be regulated in the same way? The whole thing is an interference with the freedom of trade. It is possible just because customers cannot so readily combine as dealers and manufacturers, and the state of the law in England puts an immense advantage on the side of the wrong-doer with money, when he has to deal with relatively poorer men who have not the resource of combination. There is no question of the expenses and difficulties of distributors. Let each man do his best to overcome them as they present themselves to him, and if he finds that competition is too strong for him, he will be wise to give up. He is in no way bound to keep stock which he can only sell at a loss. If the result is inconvenience to his customers, they are the parties to make his loss good in some way. It is not by a levy on the public (to whom the matter is indifferent) that he should be supported.—I am, yours, &c., J. F. T.

[The correspondence on the subject of discounts to professional photographers has occupied a large part of our space for several months past, and, as the matter has been very fully debated on all sides, the

time, in our opinion, has come when we should close our columns to the prolongation of the controversy. By this we are not precluding ourselves from allowing the discussion to be re-opened at some future date, if we should deem it desirable to do so; but in the interests of all concerned, we trust that such a necessity will not arise. EDS. *B.J.P.*]

THE BARSTOW-LUBICZ PROCESS OF COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Some months ago you published a letter from Mr. Barstow with regard to a new process of colour photography, and, having had an opportunity of examining some specimens produced by the Barstow-Lubicz process at the Colour Photographic Studio, your readers may be interested to hear the impressions I have gathered from the same.

In the first place, it is not a tri-colour method, but it has some of the faults so common with that process. Some of the colours are decidedly crude, and unless the inventors have been fortunate enough to obtain some striking sitters, for apparently the process is only applicable to human beings, the flesh tints and colour of the hair are, to say the least, somewhat unusual. Again, another fault is the imperfect register of the colours, as I found the colour of a dress encroaching on white lace and the blue of a dress running into a gold watch. In this respect, however, we all know how difficult it is to obtain perfect register in trichromatic processes.

I enclose herewith a card which was given me, and I have quoted one particular sentence. A lady present volunteered the statement that some retouching was done by hand; personally, I think there was a lot, but then one can never be sure.

Possibly Mr. Barstow will favour you with some explanation of his process, but I could see absolutely no trace of any photographic image. All the sitters were posed against a white background, and certainly all presented harmonies or contrasts of colour "as simple as possible."

Some of your readers may know that I have paid some small attention to the reproduction of objects in the colours of nature by the aid of photography, but I regret that I can only come to the conclusion that the process is a colour one; it may be a photographic one, but it is not photography in natural colours.—I am, yours, &c.,

E. J. WALL.

[The following "Advice to Sitters" is given on the Colour Photographic Studio's card of terms:—A harmony or contrast of colour as simple as possible is invariably most successful by this process. "Figured materials of many colours do not come out so well."]

LANTERN LECTURES.

To the EDITORS.

GENTLEMEN,—You have been courteous enough in previous years to allow us the use of your columns for the purpose of announcing the several lantern lectures which we are willing to loan to institutions, literary societies, working men's clubs, and kindred institutions.

This season we are able to offer your readers several new and interesting lectures in addition to those issued. These latter we may say have been thoroughly revised and brought up-to-date.

We still intend to lend free our splendid slide sets complete, with printed lecture, upon "A Day and Night in Newspaperland," and "Famous Authors, and how they write their books." These we are willing to send to secretaries of institutions, reading clubs, etc. Full particulars and forms of application will be forwarded on applying to the Lantern Lectures Department, enclosing a stamp for reply. In addition to our free loan of slides, we offer four sets upon the following subjects:—"The Beautiful Homes of England," "Some Gems of Pictorial Art," "Famous Religious Paintings," and "Popular Hymn-writers and their Work." Any of these four sets of lantern slides, accompanied by a type-written lecture (to be returned), are offered at the nominal fee of 10s. 6d. per entertainment. Carriage is paid both ways by this firm.

The lantern slides are reproduced from beautiful originals, which in many cases have never previously been placed before the public. Applications should be accompanied by postal order, and addressed "Paid Lantern Lectures Department."—We are, yours, &c.,

GEORGE NEWNES, LTD.

7 to 12, Southampton-street, Strand, London, W.C.

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—If an outsider may be permitted to say anything on the subject, I would like to make one or two comments on the "Open Letter to the Members of the R.P.S." published in your issue of last week.

It is stated that the Hon. Treasurer says that the Society would have to pay some one £200 a year for one hour's work a day. Surely no such statement could have been made or suggested by the Hon. Treasurer? It is to be assumed that the secretarial duties necessitate considerably more than one hour's work daily from the gentleman holding that office. I have not the slightest idea what the duties of the Hon. Secretary are, but I have gathered it is proposed to abolish the office, the duties of which, according to Mr. Chapman Jones, only require the attendance of the Hon. Secretary one hour a day—and instead of an Hon. Secretary and an Assistant Secretary, it is, or was, proposed to appoint one Secretary, who would, presumably, devote all his energies to the various duties. And, quoting from the Open Letter, "the strongest arguments put forward in support of the retention of an Hon. Secretary were, first, the cost (of the new arrangement), estimated about £200 a year, advanced by the Hon. Treasurer; and, secondly, that it would be a pity to do away with a post which enabled the Society to have the services of eminent photographers. In other words, why do away with a post which enables some of the office-seeking and otherwise inconsequent members to make a position for themselves?" I think it is a fact that many of the hon. secretaries have been eminent photographers, but whether they have been "office-seeking and otherwise inconsequent members" it is obviously impossible for an outsider to say. Is the Hon. Treasurer far wrong when he states that the new arrangement will cost £200 a year? It is very possible that the money will be well spent, if the finances will allow of the expenditure; for, from what one can gather, the existing arrangement does not work so well as it might. From what I know of the President, I do not think he is the man who would support proposals unless he thought they would benefit the Society. It certainly seems to be his desire that the Royal Photographic Society should be a real, live, active, and influential organization, as it ought to be.—I am, yours, &c.,

J. A. R.

November 23, 1901.

To the EDITORS.

GENTLEMEN,—At the special general meeting of the Royal Photographic Society on Nov. 11 I particularly called the attention of the members present to the fact that my presidential address, delivered on October 8, and the proposed amendments to the articles of association, had not emanated from, nor been endorsed by, the Council of the Society.

I stated, "This I gladlv do lest there should be any misapprehension in the mind of a single member present that in voting against any of the amendments, his judgment might be prejudiced by the thought that in doing so he was passing a vote of censure upon the present officers and Council of the Society. I take the whole responsibility upon myself, and I ask you to be as impersonal in discussion as I have been in bringing these measures forward. Let the measures stand or fall solely upon their merits."

My address is now in the hands of every member of the Society; but as the remarks I have quoted are at present known only to those who attended the meeting on Nov. 11, I take this opportunity of explaining the exact position of matters to the members at large. The necessity of some such explanation is made clear by a letter that has been addressed to me, in which it is pointed out that in asking the members [the writer evidently inferring the exclusion of "members of Council" from "members"] to sign the requisition for a special general meeting, I was inviting them to force the Council to exercise a power which was already theirs without recourse to compulsory measures. The inference is that my relations with the Council were strained, and that I was obliged to seek the assistance of the members in coercing the executive body. It unfortunately appears that the remarks I have quoted above did not tend to remove these erroneous impressions, and it is also stated in the letter referred to that if the exact relations of the Council and myself were generally known it would be found that several who voted for the amendments did not set any value upon them as such, and gave me their support, not in a personal capacity but simply with a desire to uphold the President as President in the action he was taking.

I shall be glad if you will allow me to record the fact that the relations which have existed in the past between myself and the Council of the R.P.S. collectively and individually have been most cordial, and also that I highly appreciate the support which I have invariably received from the ordinary members of the Society.

At the same time I have to point out that the choice of a subject for his annual address rests, by custom and precedent, entirely with the President himself, and that this year, in the exercise of this right, I chose a theme of obvious interest to the general body of members, by whose ultimate opinion of my action I am quite willing to abide. It seemed to me that the mere expression of a series of views upon methods available for improving the management of the R.P.S. were insufficient for the case, and I therefore judged it right that the members, from whom I received the honour of election to the presidency, should not only know my thoughts on the subject of the proposed changes, but by my action should be given every facility for registering their opinion upon the matter. The entire responsibility for this policy centres in me in my presidential capacity.

I preferred to move while in office rather than wait till I had

vacated the chair, when my opportunities for performing what I conceive to be an important duty to the R.P.S. and to the highest interests of photographic progress, would be less favourable than at present.

I trust I have made it clearly understood that my address and subsequent action have not been dictated by any spirit of hostility to the Council of the Royal Photographic Society, whose best interests it is my aim to promote to the utmost of my power and opportunities.—I am, yours, &c., THOMAS R. DALLMEYER.

Woking, November 23, 1901.

[Mr. Dallmeyer's definition of his position towards the Council and the members of the Royal Photographic Society is so clear that no further misapprehension on the matter can exist. But the crisis in the history of the Society remains to be faced and ended. Since the meeting on the 11th instant we have been in a position to learn that there is great and growing dissatisfaction with the conclusions arrived at on Monday fortnight. There are three reforms to which the highest importance is attached—(1) The appointment of a Paid Secretary; (2) the non-publication of nominators' names on the Council ballot-paper; (3) proxy voting. At present proxy votes are inadmissible, but it cannot be doubted that the country members of the Society will no longer be content to remain under the disability of virtual disenfranchisement when special general meetings are held, or other extraordinary business is transacted. Without anticipating the results of the purely formal confirmatory meeting and the special meeting by which it is to be followed on December 9 it is clear to us that the whole subject of the reform of the Royal Photographic Society must again be brought before the members at an early date—that, in fact, the meeting of November 11 demands repetition. But different results must be arrived at if the Society is to settle down to the performance of the work for which it exists, viz., the advancement of photography. A profound conviction that the Society is fulfilling this object in a manner which it is charitable to regard as perfunctory unmistakably lies at the root of Mr. Dallmeyer's action in pressing his reforms upon the members. As we wrote on November 8, "We are sure there will be no misconception of the motive which has guided the President in his action." The position now is plain and simple. The President, accepting all responsibility, has placed his reforms before the entire membership of the Royal Photographic Society. It cannot seriously be contended that matters vitally affecting, not only the well-being of a Royal Society a thousand strong, but the even higher interests of British photographic progress, should be eternally decided by snatch votes at small meetings, where factious opposition is supposed to be an advantageous substitute for the cool discussion of well-weighed propositions. Mr. Dallmeyer's appeal to the general body of members, "by whose ultimate opinion of his action he is willing to abide," should, and we believe will, attract to him a large volume of support in his renewed and conscientious efforts to improve the management of the Society of which he is President. But the development and consummation of this policy cannot be accomplished in a few weeks or months, and therefore we are glad to find it is felt by many influential members of the Society that it is incumbent—if not obligatory—upon Mr. Dallmeyer to pass a third year in office in order that he shall have the fullest opportunity of carrying out his reforms. That in this work he will have the support of the vast majority of the members we have no doubt at all; or that, following in the footsteps of his predecessor, Lord Crawford, he will be elected for a third time President of the Society which he and so many others are unfeignedly anxious to see rise to the full height of its dignity, usefulness, and renown. EDS. *B.J.P.*]

To the EDITORS.

GENTLEMEN,—While fully in accord with you as to the desirability of the country members of the Royal Photographic Society being able to record their votes at general and special general meetings by proxy, in writing I am sorry to say that you have fallen into a very considerable error with regard to the legal aspect of the matter.

It is not at all surprising that you have done so, however, because even amongst lawyers the rights of members of a company limited by guarantee are often but imperfectly understood.

The fact, however, remains that unless expressly incorporated, Table "A" only applies to companies limited by shares, from which it follows that, inasmuch as the R.P.S. is a company limited by guarantee and not by shares, the articles prescribed in Table "A" have no application whatever.

Furthermore, it is expressly provided by Article No. 6 of the R.P.S. 'the rights and privileges of every member and Hon. Fellow shall be personal to himself, and shall not be transferable or transmissible by his own act or by operation of law." You had no doubt overlooked the existence of this Article, but I think you must agree it finally disposes of the suggested right of voting by proxy on the existing Articles.

In your article in your last week's issue I observe you state that at the confirmatory meeting votes can only be recorded for or against the resolutions passed at the first meeting, and that such resolutions cannot be amended at the confirmatory meeting. This is perfectly correct, and I only refer to it because it seems to me to be misleading, in so far as it appears to imply that a different state of circumstances exists at the confirmatory meeting from the original meeting; whereas the fact is that, as regard amendments, both meetings are in precisely the same position. At the original meeting no amendments are legally to be submitted of which members have not had at least seven days' clear notice. Article 52 of the Company's Articles provides for this, and is strictly in accordance with the practice generally obtaining amongst public companies.

Article 52 requires that the resolutions to be proposed at special general meetings shall be specified in the notice convening the same, while Article 51 provided that no business shall be transacted at any such meeting save and except that business of which notice shall have been duly given when calling the meeting. You will thus see that, to be strictly regular, the chairman of a special general meeting, and confirmatory meeting alike, should simply put the resolution specified in the notice without any amendment whatever.—I am, yours, &c., CHARLES STEELE.

87, Mount View-road, Stroud Green, November 25, 1901.

THE RIGHT TO EXHIBIT PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—As an amateur photographer and a constant reader of your JOURNAL, I must say I read with astonishment your notes on the case of exhibiting photographs.

Surely, you are aware of the fact that Scots law does not apply to England, and vice versa in this case.—I am, yours, &c.,

Gray's-inn, W.C., November 22, 1901. W. M.

[We, like most people, are quite aware that the forms of law in Scotland are different from what they are in England. But the Copyright Act applies to the whole of the United Kingdom. EDS. *B.J.P.*]

To the EDITORS.

GENTLEMEN,—Commenting on the recent Glasgow case, you omit to draw attention to two facts—firstly, it was only a Sheriff Substitute who gave this decision (and it may already have been upset by the Sheriff Principal); and, secondly, the photographs are not distinctly stated to have been paid for originally, or, in any event, nine years had elapsed before action was taken to stop their exhibition. Also, in view of the recent Cecil-Bain romance, can decisions of the Court of Chancery be taken as precedents in Scotch courts?—I am, yours, &c.,

35-37, Back-wynd, Aberdeen, Nov. 22, 1901. G. BROOIE.

INTERNATIONAL COPYRIGHT.

To the EDITORS.

GENTLEMEN,—As we consulted you about the copying of German illustrations, I thought you would be interested to know the result. We placed the matter in the hands of my son, who resides at Berlin, and he consulted an advocate, who produced the annexed abstract before the owners and threatened them with damages should they take action in the matter. We copied the engravings in 1880, six years before the Berne Convention (1886). The copyright expires next year, so we will not do anything but decline any orders from Germany, confining our sales to England. We called in all the sales in Germany. We are, yours, &c., F. YORK (York and Son).

At the International Congress, which sat at Paris in 1886-7, it was proposed to alter the Berne Convention, and make the law retrospective, which was opposed by the English delegates. The following were Lord Salisbury's instructions:—"Her Majesty's Government are not prepared to accept this proposal. To do so might raise very awkward questions of vested interests, and it does not seem desirable to go beyond section 6 of the English International Copyright Act of 1886, viz., that where any person has produced any work in this country before the International Convention came into effect, he shall not suffer prejudice in regard to any interests in the same which were published before the date on which the Convention came into effect."

PHOTOGRAPHS REGISTERED:—

E E. Lippiatt, 2, Church-terrace, Leamington. *Photograph of a general view of Leamington.*

E. Wilkinson, 29, Rampant Horse-street, Norwich. *Two photographs of a Royal group at Sandringham.*

J. P. Milnes, 64, Hanover-street, Stranraer, N.B. *Two photographs of Sir J. and Lady Stirling Maxwell.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

S. V. P.—Your simplest plan will be to write to Dr. Grun, The Hall Southwick, near Brighton.

BOOK ON LENSES.—"BOOKS" writes: "Can you tell me the best book on lenses, and where to get it?"—In reply: The late Mr. J. Traill Taylor's "Optics of Photography." Price 3s. 6d. It may be had through any bookseller or photographic dealer.

PRINT QUERY.—"PUZZLED" says: "As a reader of your valuable JOURNAL, I take the liberty of asking your opinion as to whether enclosed print is printed in carbon or albumen?"—In reply: The print is by neither process. It is a Woodburytype. It has been returned as requested.

GLAZIERS' DIAMONDS.—"GLAZIER" asks: "Will you kindly inform me of the name and address of a firm who re-set glaziers' diamonds?"—In reply: Doubtless the name of the maker of the diamond is upon it, and it should be sent to him to re-set. If not, any glass-cutter will get it re-set for you.

REDUCING NEGATIVES.—"SUNTER" writes: "I have been trying Mr. Baskett's 'new method of reduction' of excessive negative density, and I can make nothing whatever of it. Would some one give his experience? There are two kinds of "Globe" polish, for metal, and for furniture. I have used the former."—In reply: If the method, as given by Mr. Baskett, be followed, there should be no failure.

ADDRESSES WANTED.—"HOPE" writes: "On page 693 of the JOURNAL for November 1, under 'New Printing Papers,' V.B. paper is mentioned, also 'Carbona.' May I ask where these papers may be obtained, or who the agents are?"—In reply: "V.B." paper is obtainable of Mr. A. Mallandain, 51, Cheapside, E.C.; and Carbona, of Messrs. J. J. Griffin and Sons, Ltd., Sardinia-street, Lincoln's Inn-fields, W.C.

NOVELTIES WANTED.—"BUSINESS" writes: "Could you oblige us by giving us the name of a firm or firms who supply novelties for local view trade, other than plush goods? What we require are small articles of every description with collotype or other views on, and we cannot find anything of the kind in any of your advertisement columns." In reply: Try Messrs. Faudel Phillips and Co., Newgate-street, E.C. That firm does largely in fancy articles.

ENAMELLING, &C.—"MANAGER" writes: "Can you inform me of the address of a firm who could supply me with everything required for enamelling and embossing silver prints? I have always put my enamelling out to trade workers, but, owing to increasing business, prefer to do it myself."—In reply: No special appliances are necessary except a press and dies for the embossing, and those any dealer will supply, such as Houghtons, Marions, and the like.

STEREOSCOPIC PHOTOGRAPHY.—"MAGGIE" writes: "I have two midget lenses by me, and I would like to know if they can be fitted to a stereoscopic camera? What width apart would the lenses be? And are there stereoscopic glasses made so small as for viewing midget-size views?"—In reply: Mount the lenses from two and a half inches apart, measured from the centres of the glasses. Messrs. Negretti and Zambra, Holborn-viaduct, supply stereoscopes for viewing pictures taken with the Verascope camera, which would do for pictures of about midget size.

CASKET LENSES.—"XIT" writes: "As a regular reader of your JOURNAL, I wish to refer to an article on 'Cheap Lenses for Amateur Use,' by an amateur optician, in your issue of October 4, 1901. In this article a casket of lenses of 6, 10, 14 and 20 in. focus respectively is spoken of, and selling at £2. I should be much obliged if you would inform me where such a casket can be obtained, and the makers, as I am thinking of going in for a whole-plate camera next season?"—In reply: The Busch Camera Co. supply casket lenses at a very moderate price, but not, we think, quite so low as that quoted. Write to the agent, Mr. Henry Purser, 31, Hatton-garden, E.C.

COPYRIGHT.—"COPYRIGHT" writes: "I have an order for some small photos of the King and Queen (copies), to be put in pendants, etc., and should be glad to know if I should be infringing the copyright, as I have been led to understand that there is no copyright on photos of Royalty? On one occasion I had an order for some small photos of the late Queen, and wrote to a London firm asking them to sell me a right to copy, and they replied that they could not sell, but would supply the photos required, which, of course, was out of the question. I should be glad if you would let me know through your columns whether I should be running any risk in copying the King and Queen?"—In reply: Certainly you would if the portraits are copyright, as most likely they are. Why not write to the photographer who took the portraits, and ask him to sell you the right to reproduce them?

COPYRIGHT.—"AT SEA" writes: "(1) If, having copied a copyright photograph and executed a very small order (under 10s.), what is the maximum damage to which I am liable? (2) Is a photographer justified in setting a trap to catch me by sending or causing to be sent a copyrighted photograph to me to copy, and how would such conduct stand in law courts? (3) The photographs show no marks that they are copyrighted."—In reply: (1) The maximum penalty is £10 for every copy made. (2) There is nothing to prevent him from doing so. It devolves upon the one who copies a photograph to see that it is not a copyright picture before he copies it. (3) There is no necessity for the photograph to be marked "Copyright."

OFFENSIVE LANTERN FUMES.—S. LYON writes: "Can you please tell me how to prevent the lamp of my lantern giving off such offensive fumes as it does? It is one supplied with the lantern by ———, and is a three-wick one. I used it last year many times with great satisfaction, but now it is unbearable when used—which has only been twice."—In reply: In all probability the lantern was put away last season with oil and wick in it, and has not since been thoroughly cleansed. Empty out the oil, and rinse out the reservoir with fresh oil, and then thoroughly clean the outside and wick tubes; put in new wicks that have been made dry in front of the fire, and we have little doubt but that the lamp will behave as well as it used to do.

STEREOSCOPIC PROJECTION.—F. W. DONISTHORPE writes: "(1) Would you tell me whether the Freshwater lantern stereoscopic projections have ever been done in one lantern by means of two coloured carbon tissues, such as in the three-colour process? (2) I read in one of your JOURNALS of 1896 that gelatine could not be used, as the heat of the lantern burnt it up in a few seconds. I could not understand this as all lantern slides are made of gelatine. (3) Would you tell me where I could get glass stained with uranium, such as glows in the ultra-violet rays? (4) Also, are radium salts to be obtained anywhere?"—In reply: (1) Not that we are aware of. (2) That is not so unless, indeed, the heat be exceptionally great, and the gelatine is subjected to it for a very long time. (3) It may, no doubt, be had from Hetley and Co., Soho-square. (4) We think not; but the most likely place, if any, to get them would probably be Hopkin and Williams, Cross-street, Hatton-garden.

PRINTING RIGHTS.—WHITLOCK BROTHERS write: "We have pleasure in letting you know that we have obtained the exclusive rights for taking and selling photographs at the 1902 Wolverhampton Exhibition. Our agreement is, to all intents and purposes, the same as that which Messrs. Annan had with the Glasgow Exhibition. We have had a little dispute with the 'official printers,' who have obtained exclusive printing rights. This has been amicably settled, but they contended that we could not publish view-books by mechanical processes without their permission, basing their opinion on the assumption that a collotype or process-block, etc., is 'printed matter,' and not a photograph. We believe this point has been settled in a court of law. If you know of any case would you kindly let us know?"—In reply: We do not for the moment remember any similar case having been tried in a court of law. Possibly some reader can give the desired information.

A WAGES QUESTION.—H. E. S. writes: Five weeks back I advertised in your JOURNAL for a situation, and had a reply from ———, asking for specimens, etc. I sent them and had the following reply: 'In reply to yours, with negatives, etc., I think the salary you are asking is somewhat high. The assistant who is leaving, whose place you would fill, has been receiving —s. per week. If it would answer your purpose to commence at that amount, and if I find that your work suits me, I would increase it to —s. Kindly let me know if this would meet with your views, as I require the appointment filled by the end of next week—Nov. 8.' I wrote and accepted it at the above terms, and had the following reply: 'Nov. 13.—I have had to make other arrangements in my staff, and for the present must defer engaging you.' Will you kindly tell me if I can sue him for one week's wage, as he has wasted a lot of my time, and kept me from advertising in the JOURNAL?"—In reply: We do not think that you could successfully enforce a week's wages.

WASHING PRINTS.—T. W. W. asks: "Why are P.O.P. prints washed before they are toned and fixed? I never wash them, as I use a combined bath. Some makers will recommend a combined bath, and direct to have prints well washed first before toning. Others will tell you to put into bath without previous washing. I have tried both ways, and could see no difference in results of the two. I prefer not to wash before, as I am apt to get stains in first washing, but never experience them if I tone and fix without previous washing. I have prints now I did over twelve months ago without washing, and they seem quite good. What is the advantage in previous washing? I enclose a photo which came from America. I understand it is a collodio-chloride P.O.P., at least the Kodak Co. informed me so. Could you let me know if I could get it in England. I tried Marion's for it, and they had not it, also Kodak?"—In reply: Some makers advise toning without washing because it suits their papers best; others recommend a prior washing. Washing before toning is generally considered to conduce to permanency, whatever method of toning be adopted. Twelve months is but a short test of permanency. — Collodio-chloride paper is supplied by the Paget Dry Plate Co. It is also supplied by most of the large dealers.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The Forty-first Annual issue of The British Journal Photographic Almanac will be published next week. The total number of pages in the Almanac for 1902 is 1580, and the volume is the largest yet produced. The text portion of the book occupies about 600 pages. It will, as hitherto, be issued in paper covers, price 1s., or cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Wellington and Ward, of Elstree, from a negative by Mr. W. Gill, of Colchester. The Editorial Article is entitled "Introductory Notes on Tele-photography." Over fifty articles on practical subjects, contributed by well-known photographers, form a feature of the volume. The principal advances of the year are synopsised in the "Epitome of Progress During 1901," and in the other sections, "Patented Inventions of the Year," "Miscellaneous Information," and "Practical Notes and Suggestions of the Year," there will be found much useful matter, which, with the large collection of formulæ, tables, and other data for photographers, places at their disposal for daily reference a mass of information not to be found in any other photographic annual.

*** The 1898, 1899, and 1900 editions of the Almanac (20,500 copies each) were sold out within a few months of publication.

*** The 1901 edition was disposed of in less than a fortnight.

*** The entire 1902 edition, to be published next week, has already been sold right out, and no further orders can be executed.

EX CATHEDRÂ.

A Question of Copyright.

We are most of us aware that, for the modest sum of one shilling, and the slight trouble involved in a few formalities, a photographer may obtain the copyright of any product of his camera, and that without such copyright he is unable, with any chance of success, to take legal proceedings against any one who may be dishonest enough to steal his brains. We can point to many cases within recent years in which photographers have recovered substantial sums from infringers of their rights. Protection is afforded at slight expense and trouble, and no reasonable man can complain that the existing regulations are in any way burdensome. So far so good. But we must bear in mind that the shilling fee covers the copyright of one picture only, and that if a photographer should take a series of portraits, each showing a slight variation of pose or expression, he must pay a shilling fee in respect of each one, or leave a loophole open to evildoers. This raises a curious point in connection with so-called "animated photographs." The cinematographer, in taking one subject, reels off his ribbon of film at the rate of a foot a second, and secures on each foot sixteen pictures, every one a little different from its fellows. He thinks nothing of taking a thousand pictures or more of one subject, so that if he wants to secure the copyright of the whole it means the ex-

penditure of fifty pounds or more. This not only takes the gilt off, but may be said to abrade the gingerbread away as well. In other words, the tax is quite prohibitive. Some will say that traders in this twentieth century have long ago discovered that honesty is the best policy, and that consequently the cinematographer is safe in their hands. This of course, is true of the great majority of traders, but there are black sheep in every flock, and we all know that there are obscure persons in every walk of life who prefer a crooked to a straight path. We are told that there is every reason to believe that the cinematograph film of a popular, and therefore readily saleable, kind, has not escaped the attention of these gentry, and that, although the delinquents are known, it is difficult to stop their nefarious work owing to the copyright question already adverted to. It has been suggested that the originator of the subject might so arrange his apparatus that a microscopic trade-mark appeared on every picture of a series. This could undoubtedly be done, but it would only protect the work in so far that the owner could proceed against the plagiarist for infringement of trade-mark, if he could prove his case against the delinquent. And that "if" is a very formidable objection in such a case, for a clever manipulator, as we all know, can sometimes produce from a given picture a copy so good that it is next to impossible to tell it from the original work.

* * *

An Unconquered World.

Like Alexander the Great, the photographic tourist is apt to regret that there are no more worlds for him to conquer. The camera has long been regarded as ubiquitous, and application to the nearest dealer in photographs will quickly prove that this is the case, for one can purchase pictures of nearly every region under the sun. There is, however, one district which remains as yet unconquered by the cameraman, save that an intrepid traveller, in the person of Sir Harry Johnston, has partially explored it, and has brought back some photographic mementos of his visit. The place is known as the Uganda Protectorate, and, according to Sir Harry, who discoursed on it the other night before the Royal Geographical Society, it abounds with beautiful and interesting features which will at once commend it to the artist. Unfortunately, it is somewhat far afield, but, of course, the tourist agencies will soon put that all right, and photographers will be able to get there. There is one place, known as the Nandi plateau, as large as Belgium, and from 5000 to 10,000ft. in altitude, which, although almost under the equator, is quite healthy, and admirably adapted to be the home of a European colony. We have most of us been accustomed to associate Africa with intense heat and malarial fever. But Sir Harry Johnston showed photographs of mountain scenery, snow and glaciers, which would vie in beauty with the Alps. Directly under the equator there is a snow-clad range, with peaks which rise to a height of about 20,000 feet and are believed to represent the highest ground in Africa. Sir Harry estimates that on the highest part of this range there must be about twenty miles of almost uninterrupted glaciers. Much of the adjacent scenery reminded him of England, Wales, and Scotland, so that we may assume that the country offers a wonderful variety of aspect. Other pictures which were shown to the Royal Geographical Society in the course of this interesting lecture were taken in the Semliki forest, and here again, it is evident that there are magnificent opportunities for the enterprising photographer. Here are to be found the ape-like pigmies of which we have already heard in advance. What a new field for portraiture is here; a race of human beings quite new to science, and perfectly unsophisticated. And this is not all, for in the same region was found that curiosity of the animal world, the okapi, whose skin was sent to the Natural History Museum at South Kensington some months ago to be mounted. The lecturer told his hearers that he felt convinced that if this district were fully explored other remarkable discoveries will be made of hitherto unknown mammalia. It is evident, then, that there is much work in this interesting part of the world for the camera, and that the photographer will help greatly in removing its old title, "The Dark Continent."

* * *

The Cold and the Temperature of Developing Solutions.

It is rather unfortunate, for the photographer, that the dullest season of the year should also be the coldest. With the temperature near freezing point, attention should be given to the developer, otherwise plates and paper may be unfairly blamed for want of speed. During the past week we were consulted by an amateur who had experienced difficulty in developing his enlargements, and was unable to trace the cause of failure. He had not, so far as he was aware, departed from the usual conditions. Upon inquiry we found that he was using a commercial developing solution, which consisted largely of hydroquinone. The peculiar unobtrusiveness of this reducer in cold weather is too well known for us to dwell upon it, but, from a report of the Principal of the Technical School at Munich, we see that a very useful piece of apparatus for such occasions has become a commercial article in Germany. It is known as a thermophor, and consists of a flat tin box filled with some kind of salt. It is immersed in boiling water until the salt becomes fluid, which can be ascertained by shaking the box. Dishes and solutions may be stood on the box until they are sufficiently warm for use. The thermophor may be got ready in fifteen to twenty-five minutes, and will retain sufficient heat for ten hours' use.

* * *

Dark Room Illumination.

Dr. Miethe has been writing in the "Atelier des Photographen" upon the subject of suitable light filters for the dark room. After referring to fluid screens, their defects and inconvenience, he recommends, as a substitute, glass screens coated with stained varnish, which are almost as good and far more convenient. Dyes soluble in alcohol should be selected, and the colouring matter may then be added to ordinary negative varnish. As most of the red dyes, obtained from coal-tar, transmit a certain amount of violet light, a yellow dye should also be used. For ordinary work, a sheet of flat glass may be coated on one side with varnish stained with eosine, and on the other with aurantia. For greater protection two sheets of glass may be used with the films in contact, and the edges bound round, after the manner of a lantern slide. It is best to test the safety of the screens by examining them with the spectroscope, but, where this is impossible, an extra rapid plate should be exposed under a negative, free from stain, at the distance of about a half a yard from the source of light for

five minutes. If the plate shows no trace of a positive after development the screen may be considered quite satisfactory.

* * *

"More Light." There is probably not a single village in England which does not contain some photographic devotee who is able to organize occasional lantern shows in the school-room or public hall. And even if the place cannot boast an enthusiast of this worthy type, there is generally to be found at the nearest town the necessary apparatus to conduct such functions, though the lantern may be of tin, and its illuminant only a mineral oil lamp. But it is not so in certain remote places in the highlands and western islands of Scotland. In these isolated places the people are shut in their humble homes during the long winter evenings, without anything in the shape of amusement to relieve the dull monotony of their existence. These considerations have prompted Archdeacon Sinclair, of St. Paul's Cathedral, to address a letter to the Scottish Education Department, suggesting that it would be a good thing if the Department would entrust the schoolmasters in these districts with a good optical lantern, and a certain allowance for the hiring of slides from Glasgow or Edinburgh, part of the expense being met by entrance money paid by the visitors to the lantern shows. The suggestion has been favourably received by the Department, which states, through its Secretary, that there is nothing to prevent such exhibitions forming part of the work of continuation classes under the new continuation class code, and that the Department is ready to consider any scheme which local authorities, with a due amount of local effort, propose for approval. Such a movement as this has much to recommend it, and it will doubtless be regarded as a boon by the isolated villagers for whose benefit it has been designed. But it must be remembered that while it is easy enough to buy or hire lanterns and slides, it is very difficult to find teachers who are able to turn them to the best account. A gifted man can hold the attention, and arouse the interest of an audience, with no better means of illustration than a blackboard and a bit of chalk, while the duffer will fail to do so although he has apparatus of the most efficient type. It must also be noted that village audiences do not, as a rule, care for instruction blended with amusement. They prefer niggers. That is certainly true of the rustics here in the South; very possibly the hardy Northerners, for whom the new form of education is designed, are made of sterner stuff.

* * *

German Dry Plates and the New Tariff. The proposed increase of the duty upon glass in Germany seems to be looked upon with some indifference by the dry-plate manufacturers, if we are to judge their attitude by a short paragraph in the "Photographische Chronik." It appears that a committee of inquiry was held last year by the German Home Office, as a preliminary to the new tariff, and that not a single dry-plate maker accepted the invitation to attend. As German makers get very high prices for their plates, and the additional duty is but two shillings per 100 kilos, it is quite possible they may be content to let matters take their course, and reimburse themselves by a further increase of price. The writer in the "Chronik" thinks the export of dry plates will be greatly injured by the increase of duty. It would be interesting to know if the exports of German dry plates are really an important item, in comparison with other purposes for which the same kind of glass may be used. If not, the Government may refuse to yield. The action of the Prussian Minister of Commerce and the representations of the Union of Dry-plate Makers have induced the German Home Office to make inquiries concerning the extent of the consumption of home-made glass, and with special reference to the manufacture of dry plates. Each firm will be asked to furnish statistics of the number of persons employed, the amount of their wages, the value of the glass used, the value of the dry plates made, the amount of sales at current prices, the value of the exports, etc. As such inquiries have hitherto been looked upon with suspicion, the Government have given the assurance that the information thus supplied shall be kept secret, and that every precaution shall be taken to prevent misuse of the same. In conclusion, the writer flies the flag of distress. He hopes that, in the interests of the sorely pressed dry-plate maker, the information thus obtained may be the means of bringing him facilities for the sale of plates abroad.

THE RIGHT OF PHOTOGRAPHERS TO EXHIBIT PORTRAITS WITHOUT THE SITTER'S PERMISSION.—ANOTHER DECISION.

In our issue of the 22nd ult. we made some comments on the judgment given in the Sheriff's Court at Glasgow in connection with the alleged legal right of a photographer to exhibit portraits of his sitters as specimens against their wishes, and at the same time pointed out that the decision was at direct variance to that given in the High Court here some years ago. In Glasgow it was ruled, according to the report furnished us, that the photographer had the right to use the portraits of sitters as specimens. In the High Court here it is ruled that he has no such right whatever. The forms of law, as most are aware, are different in Scotland from what they are in England, but it is seldom that decisions are given in the two countries that are in direct opposition to each other on such a question as this.

Last week Mr. G. Brodie was good enough to call our attention to the fact that the judgment was only that of a Sheriff Substitute, and also that it may ultimately be reversed by the Sheriff Principal. Possibly the plaintiff—according to the Scotch term, the pursuer—in the case may appeal. If he does, it will be interesting to learn with what result. Mr. Brodie also calls attention to the fact that the enlargement had been shown for nine years before action was taken—rather a stale specimen by that time, one would think; but that does not affect the question as to any legal right of the photographer to use his customers' portraits for any purposes of his own.

On Thursday last week another case was tried in the Chancery Division of the High Court of Justice before Mr. Justice Swinfen Eady. It was an action by the plaintiff for an injunction to restrain Mr. Geo. E. Houghton, Margate, from exhibiting on his premises a photograph of his wife and children in a group. The defendant claimed the legal right to do so. Here was a direct issue to try—the legal right or otherwise to exhibit. It appears that the wife and children of the plaintiff sat to the defendant for their portraits, and the latter had

an enlargement made of the group, and used it as a specimen. On the plaintiff complaining, it was promised to be removed, and after a time it was, but other copies of the pictures, the plaintiff found, were being exhibited elsewhere, and hence the action. Mr. Eve, K.C., and Mr. Manning were counsel for the plaintiff, and Mr. Micklen, K.C., and Mr. Solomon were for the defendant. For the defendant, counsel raised some legal points, but they were dismissed by the learned Judge in giving his decision.

In giving his decision on the question of legal right, Mr. Justice Swinfen Eady referred to the case of Pollard versus the Photographic Company—that we cited in our comments on the Glasgow case a fortnight ago—and said that when the defendant's attention was called to the fact that the portraits were being exhibited, he ought to have immediately removed them. He had now set up a legal right to do what he had done, but he had no such legal right, and the plaintiff was therefore entitled to the injunction he asked. Judgment for the plaintiff, with costs accordingly.

We direct special attention to this second decision in the High Court, because that given in the Glasgow Court has produced, in the minds of some, the idea that they are legally entitled to make use of their customers' portraits as specimens. But this second decision, confirming that given in 1888, dispels all doubt on the subject, notwithstanding that given in the Scotch Court—at least, so far as England is concerned. Therefore photographers should take this case as a warning, and not make enlargements or exhibit copies as specimens without previously getting the customer's sanction, for a suit in the Chancery Court, when an injunction is granted with costs, is a somewhat costly matter, and not soon forgotten by those who have to pay. We are quite aware that photographers sometimes have a difficulty in getting up specimens, and are therefore tempted to make use of sitters' portraits, which they may think suitable, without asking their permission to do so. But it will be seen that such a proceeding is illegal, and that they may at times land themselves in a costly law suit.

Many persons have a decided objection to their portraits being publicly exhibited, while others, on the contrary, will rather take it as a flattering compliment if they are These latter would willingly grant the necessary permission if asked, while the former would refuse it; but in any case the sitter should be consulted.

There is a phase of this subject, quite apart from the legal aspect, that should appeal to professional photographers, as we have pointed out on several previous occasions. It is this. Is a photographer wise, from a purely business point of view, in continuing to exhibit a customer's portrait, and refuse to withdraw it when requested? The refusal is, of course, an offence, and the sitter is not likely to patronise that establishment in future, nor is he or she likely to recommend it to their friends; indeed, on the contrary, they will, more than likely, discourage them from going there. In this way, indirectly, an incalculable injury may be done to a business. It is always good policy to please all customers, and therefore the sitter's permission should always be asked before a portrait is publicly shown. When this is politely done, it is not often refused. Some persons would not mind (though they may not desire it) their portraits being shown if their sanction were asked in the first instance, but they might consider it a liberty taken if it were used for show purposes without their permission being asked.

In the case of Mr. Houghton, however, there were points, aside of the legal and business aspects of the matter, which call for reference. It was not brought out at the trial that, although he considered that the husband was not legally entitled to any property in the negative, it having been ordered and paid for by the wife, he was willing, and did, in fact, remove the enlargement complained of. Inasmuch as it was by inadvertence, and without his knowledge, that a cabinet of the group was, twelve months afterwards, exhibited with others in a show frame, the proceedings were perhaps unnecessarily peremptory. The facts were that Mr. Houghton, in the height of his season, received a letter from plaintiff's solicitor, giving him notice that unless he received by first post the next morning an undertaking to remove the photograph, he should take steps to enforce its removal. As a matter of fact, a writ was issued the very next day, and leave applied for by counsel to serve notice of motion at considerable cost. Mr. Houghton at a very early stage of the proceedings expressed his willingness to destroy the negative and all copies, and was all along willing to do so, the negative being in Court for that purpose. If these facts had been brought out at the trial a different result might have been arrived at.

THE LIMITS OF VISION.

[Abstract of a Paper in the "Journal of the British Astronomical Association," vol. xi., No. 9, July 26, 1901.]

WITHOUT being either an oculist or an optician, I have always felt great interest in questions relating to vision, and especially as to its limits and to alleged extraordinary instances, and I have come, after many years' attention, to the conclusion that, if we eliminate the cases of defective organs, the sight of the remainder of mankind is of a fairly uniform character, and that this is especially the case as regards definition. If we leave out of consideration those who are short-sighted, the astigmatic, and the colour blind, and cases of opacity of the cornea, or other organic defects, then the recorded instances of differences in powers of vision require explanation so far as normal eyes are concerned, if we accept them as related to us.

There are three separate yet connected questions to discuss. There is the question of what is the smallest visible area; there is the question of seeing faint objects and detecting faint shades, and the question of the perception of minute detail.

The reply to the question of the smallest visible thing is that there is no assignable limit to the minuteness of visible objects. It is entirely a question of contrast. If an object is sufficiently brilliant on a dark background, it will remain visible, however minute it may be. This is easily proved. There are about 3000 stars visible to the unaided eye at one time, and, if all the light of the stars proceeded from these only, the average disc would be less than $\frac{1}{164}$ of a second. A sixth magnitude would be much less, certainly not $\frac{1}{1000}$ of a second, yet this minute object remains perfectly visible because of its brilliancy in contrast with the dark sky. Mr. Maunder experimented some years ago as to what were the smallest objects he could see, and came to the conclusion that 32″ to 36″ was his limit for a single spot, but a row of dots not more than 8″ each was perceptible as a diffuse line. His experiments are referred to in our "Journal," vol. v., page 144, and in "Knowledge," for November, 1894. I think Mr. Maunder only tried dark spots and lines of spots, and these areas and lines could only be seen and not defined. I am not aware that he tried bright objects on a dark ground, but there is no conflict betwixt his experiments and my statements. We do not define the star, we merely see it is there. Instead of appearing the $\frac{1}{1000}$ of a second, it impresses our retina as if its light was spread over one or two minutes of arc, and in the

case of a brilliant line, even if but a fraction of a second in thickness, we always see it at least one minute in breadth, and generally much more. But the visibility rapidly lessens as brilliancy diminishes, or as the background becomes lighter, until we reach the point where contrast fails. To prevent misconception, it is perhaps necessary to say I am applying this only to objects too small to cover an appreciable area or an appreciable breadth.

I do not think it is possible to lay down any exact rule regarding the perception of faint objects or faint shades. The sensitiveness of the retina is a variable quantity, like the sensitiveness of the photographic plate. The fact that one person or one hundred persons fail to see a faint object or a faint shade is not of the slightest value in disproving its existence to the one person who can see it. But exactly in proportion as extraordinary sight is claimed in this direction we are entitled to ask for proofs of its possession. If a person avers that he can see eighth magnitude stars with the unaided eye, we may properly hold his claim to be unproved unless his exceptional vision can be tested beyond dispute. Such test can never be convincing when made on an object known to be there. Seeing faint marks upon a planet after study with a larger telescope, or after learning its features by rote from a map, can never offer good enough proof to satisfy a doubter. Too many people see a thing if they know it is there. The late Herbert Sadler once sent me a list of stars alleged to have faint companions. I failed to see some of them, and asked him why he had not rather asked an observer who had a larger instrument in a better position. He replied that it was useless, because that observer, if told the stars were there, would be sure to see them.

The question of the perception of minute detail, or dividing and separating, is of a different character, and we have firm ground on which to form a judgment. The nature of light restricts the power of the human eye just as it does the power of the telescope or microscope, and we can reason from one to the other with perfect reliance on the conclusions we are led to. Now we know that 4″·56 divided by aperture in inches expresses the limit of the dividing power of a telescope, and as the aperture of the eye is about one-fifth of an inch we easily deduce 22″·8 as the limit of possible definition with the unaided eye, but neither eye nor telescope will divide two points so close without some magnifying power. A 12-inch telescope which divides to 0″·38 will not show two stars at that distance separated to a normal eye without a power of at least 300, and few will manage it at that—I think 500 will be needed, which is 42 to the inch. If, then, aperture of eye is one-fifth inch and 40 to the inch is required for clear definition, it is evident that a power of 8 would be required to see 23″, and that, as we cannot apply this power, the distance must be increased 8 times, and 8 times 23″ is 184″, or roughly 3′ of arc. Now, this agrees with experience, for eyes can see ϵ^1 ϵ^2 Lyræ apart, and that is all. As they are 207″ apart, they are fairly over the limit I have laid down. I think separation with the naked eye of objects less than 3′ apart may fairly be set down as self-deception.

Of course the iris expands in darkness, but what is gained thus by increased aperture is lost by increased aberration. Definition is rather worse than better under such circumstances.

In Webb's "Celestial Objects," there are some references to the visibility of the crescent of Venus and the statellites of Jupiter with the unaided eye, with mention of cases cited in the "Leisure Hour" for 1853, page 503. I think it necessary to give the date, because, after I had read a former paper acknowledged to be derived from the "Leisure Hour," an unscrupulous anonymous writer in a well-known publication accused me of fabricating the whole story and imposing it on the British Astronomical Association. He had not even decency enough to ask me to give volume and page before branding me as the—shall I say—novelist of the Association. The paper in the "Leisure Hour" claims for the writer to have seen Saturn and his rings misshapen. "The elongation was very apparent, not like the satellites of Jupiter, at first suspected, guessed at, and then clearly discernible, but such a view as was most convincing." Several of his associates "at once told him in which direction the ring lay," which makes one wonder at the wealth of visual power then collected in Armenia.

There is not, so far as I can find, any claim that any one ever saw the eclipse of Saturn, the crescent of Venus, or the satellites of Jupiter previous to the invention of the telescope. The ancient observers who studied the heavens with so much assiduity seem never to have suspected anything, and Galileo's first intimations of his discoveries were met with incredulity. His telescope, magnifying 32 times, did not enable him to say what was the nature of Saturn and his appendages, and no less than 49 years elapsed before the explanation was given in 1659. Saturn and his rings at their nearest form a rough eclipse 40″ × 18″, so that they do not form an object of sufficient dimensions to make an impression of shape upon the retina, as it is obviously a case of self-deception. Most of these naked-eye observations are very indefinite as to dates, and therefore it becomes impossible to seriously examine the observations. In some cases much depends upon whether the planets were in opposition, and, in the case of Jupiter's satellites, upon the position of the satellites. I can only suppose they were in opposition, and take the most favourable cases. Theodore Parker, at 12 years old, saw the crescent of Venus with the naked eye, not knowing it was a crescent beforehand. No date is given, and I cannot find Parker ever gave any other proof of exceptional sight. Stoddard saw her "not round," and with a dark glass saw the minute and beautiful crescent. Curiously he saw it better thus than with a telescope made of spectacle glasses magnifying six or eight times. Now, Venus never exceeds 70″ in expanse of horns, which is not enough to form a definable area. If the middle of the crescent were cut away and only the points left, like two stars, they would be only one-third the distance apart of ϵ Lyræ, and quite inseparable. There is an easy test any one can make. Take a telescope magnifying 27 times and turn its eye-piece towards our own crescent moon and see if that is still visible as a crescent.

With regard to Stoddard's views of the satellites of Jupiter, we have no dates, but his sharp-sighted associates were never sure they could detect them. Stoddard saw them always at the same hour of the evening, always during twilight, and hardly for more than ten minutes. They were visible when only 1st and 2nd magnitudes could be seen, and no 3rd magnitudes could be detected, although the brightest satellite is barely 6th magnitude, and close to a planet at least eight or nine magnitudes brighter. Again, we are not told whether Jupiter was in opposition at the time.

There are other reported observations of these satellites with the naked eye, which, without specifying, I will examine in the total. Satellite No. 1 never departs further from the limb of Jupiter than 120″, which is a little over half the minimum possible distance of visibility of two equal stars. I dismiss No. 1. No. 2 reaches 206″ or practically the distance the two stars of ϵ Lyræ are apart. Is it credible that a sixth magnitude can be seen so close to so bright a planet, either when third magnitudes are invisible, or at any other time? Nos. 1 and 2 are alleged to have been seen as one. This could only happen when No. 2 was at No. 1's greatest elongation, or 120″ from Jupiter, and would be impossible if Jupiter was only of fifth magnitude. We may dismiss No. 2, either singly or in partnership. No. 3 is brighter, and may attain 343″, or 1¾ times the distance of ϵ^1 and ϵ^2. If any satellite has ever been seen with the unaided eye it is No. 3, but I confess I think the irradiation of Jupiter is too much for even this. No. 4 is too faint to bee seen, even if degrees away from Jupiter, unless by eyes which can see seventh magnitude stars, but it might, when suitably placed, add its lustre to that of No. 3. But, seeing the difficulty of dividing the two Lyræ stars of equal magnitude, it seems not possible that two stars with a difference of at least eight magnitudes can be seen apart at less than twice their distance.

The exceptional powers of vision attributed to uncivilised men, and to civilised men who pass their lives in the open air, supposing they exist, are easily explained. They are only manifested while looking at familiar things which the supposed possessors of such sight have been long trained to see. The shepherd distinguishes sheep where the town-dweller sees nothing, because the one is accustomed to the place and objects, and the other not. The herdsman distinguishes cattle and the huntsman his prey, because they are practised, and see little differences which, perhaps, they cannot describe, but which

they perceive almost unconsciously. The sailor and the longshoreman detect what the visitor fails to see out on the horizon, and will tell you of the peculiarities of rigging which enable them to distinguish one boat from another. Of course, they are used to these things, and undoubtedly see more, and also guess more, than the casual observer, for in my experience they are not seldom wrong. We have been told of the excellence of the Boer sight compared with that of British soldiers; but here, again, the Boer was in a country familiar to him, and its objects familiar, and he was mostly hidden, while the British soldier stood out in the open. Besides, many of the Boers possessed a good pair of binoculars, and, having picked up their enemy with them, they could see him after with the unaided eye.

EDWIN HOLMES.

THE MEASUREMENT OF LIGHT AND DIAPHRAGMS.

IN replying to the article of Mr. G. Watmough Webster, in this JOURNAL of October 25, I will say that beyond the acknowledged purpose of amusement, I am entirely in earnest as to every statement made in my article of September 27.

I believe that the placing of light, simply and freely, in the hands of him who would use it, is one of the very interesting things that science must do, and that the great popular interest that is being taken in photography, and the loss of the great majority of plates and films that are exposed, by reason of the ignorance of light as a simple chemical force forming a part of the process, points clearly to the fact that the time is ripe for such knowledge to be forthcoming.

It is my opinion that the reason of the slow growth of art in the world, as compared to music, is because it has not sufficient knowledge of space and light on which to found its system of education, and that because of the lack of such foundation it cannot lead its pupils, through the knowledge of Nature's laws, to that broader and deeper observation and understanding of her which is necessary to create in us a deeper sympathy and fuller love.

A scientific basis of Truth, broad enough to carry upon it a thorough system of education, is the road on which every branch of knowledge, that is recognised as such, has travelled out into the lives of the people. The truth that one man discovers with a kite in a thunderstorm becomes a basic force whose motion starts a wave of investigation and study, and the result is an epoch in the progress of the knowledge of electricity.

It must be confessed that the theories held and taught concerning space and light, as they are associated, proclaim those laws to be of a very complex nature; in my opinion, much more complex than they really are.

For instance, in "Photometrical Measurements," by Wilbur M. Stine, Ph.D., of Swarthmore College, let us observe how the author proceeds to establish what he calls a "practical unit of illuminating power."

From Article 37 we learn that the "intrinsic value of a light-source" has reference to the quantity of light emitted from a square centimetre of its area, and in Article 36 he says, in different words, of course, that IF a square cm. of a light-source has a unit of illuminating intensity, it will produce a unit illumination on a surface, IF that surface has an area of one square metre, IF it be a concentric spherical surface, and IF it be at a radial distance of one metre from the source of light.

Now it is seen that all that is required by this authority in order to establish a "practical (?) unit of illuminating power" is the fixing of five Physical Constants, i.e., two constants of area, one in the light source and the other in the surface illuminated; one constant of curvature, one of linear distance and one of light intensity. Now in Nature we receive our light primarily from the sun, and secondarily from the sky and from what we may call "earth reflections;" and if Mr. Stine had placed in our hands an easy method of ascertaining the number of square cm. on the sun, sky, and the surfaces that reflect light to us from the earth, we could at least give him credit for trying to be "practical" up to the point of his own opinions; but he fails to supply us with the means of obtaining the knowledge that he says is necessary for us to have. Neither does he give us a practical method of ascertaining whether a light-source has a "unit illumination power" or not, or how to measure the power that it has. And can it be true that we must measure the area of our subjects when we are about to photograph them? And does he desire us to think that the size of a surface that a light shines on is one of the factors in calculating the strength of the light-source? Personally, I had always considered that what a light shone upon had to do simply with the utilisation of that light and not with the strength of the light itself.

And in our simple labours of every day when we need to know the strength of light in a cloud, on a face, or in a dark interior, how are we to compare that surface with a "concentric spherical surface" and make "practically" and quickly the necessary deduction by reason of the variation of our subject from that standard physical condition? And how are we to compare the distance from the light to the object lighted with the standard of one meter, and make our deduction easily and "practically?"

Suffice it to say concerning this book, that after the author has established the five physical constants, not one of them can be compared with exactness to conditions in nature, and that the author has not, with all the striving, made a simple unit or scale that can be used in every-day study of light as it shines about us.

And later in the book, when the study of "photometers" is taken up, in the instructions for using these instruments, there is not observed a single one of the five constant physical conditions that before are proclaimed necessary for the establishment of the "practical unit," nor is any further reference made to them.

And in working with these instruments what law of nature is used? Just the same law as the wildest savage would use in balancing a stick over his shoulder. He would simply *balance* it; and that without ever having heard that there was a law of gravitation. There are even dogs who, by their animal instinct alone, will look for the place in a stick that will allow it to balance in their mouth.

Suppose we ask a man to tell us how much wheat he has in a box, and in reply he would divide the quantity into two parts by balancing the halves. Then he could say, in the language of the "smart child," that he had "as much again as half," but we would not consider that he was very intelligent as to weights and measures.

Still, after so much striving in complexity to establish a light unit, this is the way that light is finally measured out to us, and the instrument is called a "photometer." "Light-balance" would be a much better name for it.

The very basis which this author lays down as the foundation of his photometrical measurements is a supposed condition which is not only illogical, but impossible. He just the same as says in Article 33, "Suppose that a globe of light be so small that its diameter occupies just the same angle from a point two metres distant that it does from a point one metre distant." Upon this impossible basis is built up the author's scheme of light-measurement, and I will leave it to the logic of the average school child as to whether such a scheme shall be able to stand the test of investigation or not.

At any rate we must all confess that the photographic worker has no simple truths of space and light on which to base his work of every day, aside from the "photometers" or exposure meters which little more than suggest the deeper study of light that should be made.

If there is in space a simple (not a complex) natural value which is the regulator of light-values (aside from the law of its point intensity) we do not have it in hand. If we did, we could say in speaking of using light: "In taking such a picture it is best to allow from four to six units of light to fall on the face from a pure sky," &c. That is to say, if the value is simple, the unit and scale may also be simple, and to this end we should work in our investigations. A simple measure should measure the space from which light falls, with just the same simplicity that a meter measures linear distance.

But as to Mr. Webster's article. He says, "To begin with, it would be utterly impossible to have a surface of one metre exposed to a point of light one centimetre from *under the given conditions of the law that he apparently quotes*" (I have placed the italics).

Mr. Webster seems to forget that my purpose was to show "*a natural condition* which we see about every day, but which the generally accepted law (which we know to be a farce) was inadequate to account for or to measure. But instead of remembering my intention, he says that I am in error. This is the spirit of the scientist concerning light. They just the same as tell us, "If you wish to prove the perfection of our laws, as arranged, you must select in nature those conditions that agree with those laws. But do not take them out in the light and use them indiscriminately, or you will find that *nature is all wrong and in error* because it will not be found to agree with these 'our perfect laws.'" This is diverting, to say the least.

I do not see, however, that Mr. Webster is of this class, as he claims as well as I that the law in question is not true; or, at least, that the natural condition that I mentioned does not come under the law, as he says, "It is not the case that such proportions of received light would exist." He further adds: "The *true* law that governs such receipt of light is as will follow, and is well worth remembering, for to the best of my belief, no one but myself has ever published it."

I quote this simply to show that the knowledge of light is, as I have said, in a very complex and unsettled condition. I am glad to see that Mr. Webster has original ideas on the subject, and that he does not believe in the "farce" that is so generally accepted as a law of light. This is the duty of every one, to give to it his best thought, and aggressively, that the doubt and complexity may give way to sureness and simplicity, and that the study of light and its use may become possible to all.

I cannot understand why Mr. Webster should say that my "paradoxes" are founded on *the error* of treating a point of light as radiating on to a plane surface in close proximity."

It is true that I used exceptional conditions of light as my examples, but they were typical, and in no possible sense can they be called *errors*. *No natural condition is an error*, and if an accepted law is not capable of explaining that condition, *the law is in error and not the condition*. My example of "a point of light radiating on to a plane surface in close proximity" represents a very common condition of illumination. Notice the lamp on the table; the light it gives is visibly brightest nearest to it, and visibly diminishes at the outer edges of the table and around the room. The electric light in the street shows its graduations on the buildings and the street, and the window light becomes less as the floor and walls recede from it. This example is typical *of a small light shining on receding surfaces*. The example of a large light shining on a small surface is typical of the sky or any broadly expanded light shining upon any surface point.

I am constrained to ask again, then, why such an absolute falsehood as is this supposed law comes to be accepted by the R.P.S. as the proper basis for the measurement of diaphragms.

It certainly is true that diaphragm *f*-8 has four times the area of diaphragm *f*-16, and the Society says that it admits four times the amount of light, so in this system they proclaim to the world that "an opening admits light in proportion to its area."

Although Mr. Webster is a Fellow of the R.P.S., I am glad to note that he does not believe the statement, and we can only wait for some "authority" to explain to us "why they did it," and why they continue to do it.

As to Mr. Webster's good-natured point concerning "authorities and authorities," I will confess that I have been deprived of the necessary education by the necessity of working hard all my life, but I have the satisfaction of thinking that the greatest men are those who continue investigating and learning little by little, in the spirit of children, and if I may have the honour to class myself with such men, I am willing to begin down at the very feet of the rest, knowing that, if it is only the truth that I wish to find, there is always a progressive and interesting road ahead. I believe, furthermore, that Mr. Webster will share my sentiment in this matter, and I have no desire to imply to the contrary.

The fact that I have not advanced a single word concerning my own opinions of the relation of space and light, ought to prove to the reader, Mr. Webster included, that I am not trying to pose as an "authority."

Another word concerning the importance of the study of light: I believe that photography has leaped ahead of the knowledge of light on every side, chemically, mechanically, and optically, as relates to the manufacturing of lenses, and for that reason we have so many photographers, both amateur and professional, and so few who really excel in their work.

In making an exposure, the worker, considered only as an artisan working in a process, must mix together in their proper proportion the three factors of light, time, and chemical sensibility before he can apply his chemicals to the emulsion, and if that worker has not in hand, by law and measurement and by unit value, those three factors, he cannot claim even to be an intelligent artisan, much less an artist.

We should not learn these things because they are the most important; but that we may, in knowing them, step beyond them into a field higher than the process, where human sympathy will lead us to think and feel, and where we may learn that the process is simply the good servant that waits upon our word. As photographers, we must remember that no matter how grand a thought we may have, we must reduce it to visibility for the benefit of others, and that a perfect knowledge of all that pertains to the process is as necessary as is the knowledge of grammar to the orator with a great thought, and even as the orator knows his language, we should know our process so well that it does not annoy us, or occupy our time in its consideration, but simply gives us freedom of action where ignorance would bind us, and confidence where doubt would make us hesitate.

It is my opinion that in the study of light lies the field for greatest improvement in the years to come, and that a free discussion for the honest purpose of uncovering the truth and placing light on a studiable basis, would be of great value to the great army of photographic workers on every side.

F. M. Steadman.

THE RIGHT TO EXHIBIT PHOTOGRAPHS.

Stedall v. Houghton.—This was an action for an injunction to restrain a photographer from exhibiting a photograph on his premises. The defendant claimed the legal right to exhibit it. Mr. Eve, K.C., and Mr. Manning appeared for the plaintiff, and the defendant was represented by Mr. Micklem, K.C., and Mr. Solomon. Mr. Eve, in opening the case, said the plaintiff, Mr. Stedall, was the manager of a mantle warehouse, and the defendant was a photographer at Margate. In June, 1899, the plaintiff was residing with his wife at Glanmore, Arthur-road, Margate. At that time serious differences existed between husband and wife, and the parties were not on speaking terms. On the 16th of that month the wife, unknown to her husband, took her two children to the defendant's shop, and the three were photographed together, and the copies were in due course sent to the wife's address, and 14s. had been paid in respect of them, leaving 3s. still owing. Subsequently the plaintiff took proceedings against his wife, which resulted in his obtaining a divorce. The plaintiff afterwards discovered that the defendant, having enlarged the photograph, was exhibiting it on his premises. He accordingly went in and told the defendant that the children appearing in the photograph were his, and he requested him to remove it. This the defendant promised to do when he could prepare another to fill its place, saying that he only exhibited it as a specimen of his work. The plaintiff was satisfied with that statement. However, on calling at the shop several days afterwards he still found the photograph there. He again drew the attention of the defendant to the fact, and shortly afterwards it was removed. The plaintiff subsequently saw a small copy of the photograph exhibited in an advertisement case in one of the public streets in Margate. When he called the defendant's attention to it, he said he was not aware of its presence there, but he would remove it, although he claimed the legal right to have it there. The plaintiff then brought the present action. He (the learned counsel) contended that the defendant had no such right. The wife in having the photograph taken was acting as agent for her husband and she must be taken as having his implied authority. The lady had no separate estate, and it must consequently be assumed that the money that was paid for the photographs was the husband's money. The plaintiff said he used at one time to give his wife an allowance, but subsequently stopped it. He was living with her at the time the photographs were taken. The defendant said that Mrs. Stedall was quite a stranger to him when she came to have the photograph taken, and the transaction was all with her. The enlarged photograph was simply exhibited as a specimen of his work, but he might have sold it if he had had an offer. It was a common thing for a photographer to have a good photograph enlarged for the purposes of exhibition if there was no objection raised. He claimed the legal right to exhibit this

photograph, and that was why he had refused to give any undertaking on the subject. Mr. Micklem, for the defence, referred to the Married Woman's Property Act, and said that Act put a married woman on the same footing as a femme sole with regard to her separate estate, and her contracts only bound her separate estate. No sufficient evidence had been adduced here by the plaintiff to show that his wife had, in fact, no separate estate, and the onus of proving that rested on the plaintiff. There was nothing, moreover, to show that the money paid to the defendant was not the lady's own money—some she had saved, or put by. On these grounds, he submitted that the plaintiff's case failed. Mr. Justice Swinfen Eady, in giving judgment, said he came to the conclusion that the wife had the implied authority of the plaintiff to have these photographs taken, and on the evidence, no doubt, the money paid for them was the husband's money and not that of her separate estate, which had been suggested. When the defendant's attention was called to the fact that these photographs were being exhibited, he ought to have immediately removed them. He had now set up a legal right to do this, but he had no such legal right, and the plaintiff was, therefore, entitled to the injunction he asked. Judgment for the plaintiff with costs accordingly.—"Standard," November 29, 1901.

RHYS WILLIAMS VERSUS KODAK, LTD.

In the King's Bench Division (before the Lord Chief Justice of England and a special jury), on Monday last, December 2, the case Rhys Williams v. Kodak, Ltd., was part heard. It was an action to recover damages for alleged defects in photographic films. Mr. Danckwerts, K.C., Mr. Æneas Mackintosh, and Mr. J. E. Raven were for the plaintiff; Mr. Moulton, K.C., and Mr. D. M. Kerly for the defendants. Mr. Danckwerts stated that the plaintiff was a member of the Bar and a gentleman of means, who spent a good deal of his time in photographing things of interest on journeys which he made. His father lived in Wales, and for the purpose of helping local charities the plaintiff gave lectures on the subject of these journeys, and illustrated them with slides from the photographs that he had taken. In 1900 he and his uncle, Mr. Morgan Williams, who was known as a big game hunter, were undertaking a journey to Uganda for the purpose of hunting big game, and the plaintiff went to the Photographic Association, Ltd., of which he was a member, and which did not deal in photographic materials, but had members paying an annual subscription in return for which the Association provided materials for members, and afterwards developed their photographs. The plaintiff consulted Mr. Le Couteur, the manager, as to what camera he should get. Mr. Le Couteur told him he ought to use a No. 5 Cartridge Kodak, and this camera was all right, and had given excellent results. But at the same time he got a spool of films, and later a dozen more spools, each containing 12 films. These were bought by Mr. Le Couteur from the defendants on behalf of the plaintiff. Mr. Rhys Williams and his uncle then went out, and on board ship the plaintiff took certain photographs, which were handed to a photographer at Mombasa to develop. He then went on into the interior and took photographs, which, when brought home and developed, were utterly useless. The jury would be satisfied that there must have been a great deal of carelessness in the making of the films, dirt having apparently got between the film and the emulsion. Mr. Morgan Williams had the same experience with films that were developed by the Kodak people themselves. Correspondence ensued, and the defendants wrote that they could not accept responsibility for sensitive material stored by purchasers and that all material was in perfect condition when it left their works. The films were developed partly by the defendants, partly by the Association, some in New York, and some in Cape Town, and throughout they were found to have finger-marks upon them. When the plaintiff asked for compensation the defendants said that the fault was due to climatic influences, and that they had complete proof that the films were perfect when they left their works. As to the damages, the plaintiff wanted to make up to the charities the money they had lost. At the same time, he would have had pleasant souvenirs of his visit but for the films being bad.—The Judge: The loss of the pleasure of keeping reminiscences is not recoverable. Is there any serious dispute that these were bad films? Mr. Moulton: Yes, my Lord. But there is a point which goes to the root of the case without that.—Mr. Rhys Williams, the plaintiff, gave evidence in support of his counsel's opening. He said that he had special tin cases made for each spool, so that they should not be affected by the heat. He had been taking photographs for some years, but he did not develop them.—The Judge: You press the button. I know it requires some skill. The witness said that he did not develop now. He had been accustomed to give lectures illustrated by photographs.—The Judge: Are you going to prove notice? Mr. Raven: No, my Lord.—The Judge: Then I cannot admit the evidence. The damage is too remote. It is the old story of the horse-shoe. You would be asking for the loss of profits on the refreshments to be supplied at the lecture.—In cross-examination, the plaintiff said that he did not pay anybody for the spools. A charge was made against him when he came back. He thought it was on the notepaper of the Photographic Association, Ltd., of which witness was a member, though not a shareholder. He first got the camera and one spool, and four or five days later he got a dozen spools. They were packed in tins by Mr. Le Couteur. The climate of Uganda was not very damp. He had perfect weather when he was there. When he came back he refused to pay the Photographic Association for the films, and Mr. Le Couteur allowed him the deduction.—Mr. Le Couteur, the manager of the Photographic Association, of 16, Brook-street, gave corroborative evidence. He said that he had had 30 years' experience, and he developed a number of the plaintiff's films. He had developed Kodak films for other members, and the same defects showed themselves. He thought the celluloid had not been polished and cleaned before the emulsion was spread upon it. He had called the defendants' attention to a large number of complaints of this kind from their customers. A number of films with the same kind of marks had been developed very quickly in England. Cross-examined; They did not sell to other persons than members.—Mr. Moulton: I put it to you that you sell over the counter. Witness: We have no counter. In further cross-examination the witness said that the Association got the trade discount and an extra percentage for cash, and made a profit on the resale at the ordinary retail prices. This enabled them to keep up their club. It was a condition of the Kodak Company that no discount was to be allowed on resales.—At this stage his Lordship said that if there was going to be a dispute as to the condition of the films it was for the jury. Otherwise he did not see that there was any question for them. It was then agreed that the whole case should be left to his Lordship.—The Judge: It is practically going to be admitted that these films were bad. Mr. Moulton: Oh, no, my Lord.—Mr. Butler Humphreys the manager of the London Stereoscopic Company, stated that he was of opinion that the faults could not have been caused in development or by climatic influence. Cross-examined: If a film was kept too long it would have a mottled appearance. However trying the climate, films ought to keep a certain time. He had never been able to trace the actual cause of these marks, though he had referred them to the Kodak Company many times.—The jury were then discharged, and the case was adjourned till Friday.

ROYAL PHOTOGRAPHIC SOCIETY.

Next Monday's Special General Meetings.

The following official notices have been issued to members:—An extraordinary general meeting of the members of the Royal Photographic Society will be held at 66, Russell-square, London, W.C. on Monday, the 9th day of December, 1901, at 7 o'clock p.m., at which meeting it will be proposed to confirm the following special resolutions which were duly passed at an extraordinary general meeting of the members of the Society held on the 11th day of November 1901.

1. To amend Article 4, which reads:—

   "For the purposes of registration the number of members of the Society is limited to 1000,"

   by the substitution of the figure "1500."

2. To substitute for Article 15, which reads:—

   "Ordinary members may at any time compound for their future annual subscriptions by the payment of ten guineas, and Fellows by the payment of twenty guineas, if all subscriptions due from them are paid."

   the following:—

   "Ordinary members may compound subscriptions by the payment of ten guineas on election in addition to the entrance fee, and Fellows by the payment of twenty guineas on election, or at any time if their subscription for the previous year be paid, by the payment of ten guineas and twenty guineas respectively."

3. To amend Article 16, which reads:—

   "Members residing out of the United Kingdom may be exempt from their annual subscriptions by giving due notice in writing to the Secretary. Such members shall not be entitled during the period of non-payment to any of the benefits or privileges of members."

   by the insertion of the words, "for the years following that current," after the word "subscriptions."

4. To amend Article 17, which reads:—

   "Every member admitted into the Society shall be considered as belonging thereto, and as such liable to the payment of his

annual subscriptions until his name shall have been removed by the Society from their register, or until, having previously paid all arrears, he shall have signified to the Secretary in writing his desire to resign. The payment of the admission fee or subscription shall be considered as distinctly implying the acquiescence of the member in all the rules and regulations of the Society."

by inserting after the word "resign," the words, "but no candidate, although elected, shall be entitled to any of the privileges of membership until the prescribed fees are paid."

5. To substitute for Article 18, which reads:—

"Members whose subscriptions are twelve months in arrear shall not be entitled to attend or take part in the meetings of the Society, nor to receive the Society's printed papers, nor to vote. Any member whose subscriptions are two years in arrear shall be deemed to have forfeited his claim to membership, and his name shall be suspended on the notice board unless the Council give instructions to the contrary. His name may be removed from the register by order of the Council, but he shall, nevertheless, continue liable to pay the arrears of subscription due at the time of his name being so removed."

the following:—

"Any member whose subscription is twelve months in arrear shall not be entitled to attend or take part in the meetings of the Society, nor to receive the Society's printed papers, nor to vote. He shall be deemed to have forfeited his claim to membership, and his name shall be suspended on the notice board unless the Council give instructions to the contrary. His name may be removed from the register by order of the Council, but he shall, nevertheless, continue liable to pay the arrears of subscription due at the time of his name being so removed."

6. To amend Article 19, which reads:—

"Subject to Article 18, ordinary members and Fellows shall have the right to be present and to vote at all ordinary, technical, and general meetings, and to propose candidates for membership. They shall be entitled to the use of such instruments and books as the Society may possess, to receive the numbers of the Society's 'Journal,' to free admission to the exhibitions of the Society, and to free tickets for such exhibitions, under such restrictions as the Council may deem necessary. They shall have the privilege of introducing two visitors at the ordinary and technical meetings."

by omitting the words "ordinary, technical, and general"; and by substituting for the words after "visitors," the words "at all meetings other than special general and annual meetings."

7. To substitute for Article 20, which reads:—

"No question shall be discussed or motion be made at the ordinary meetings relative to the direction and management of the concerns of the Society, without such notice having been previously given to the Secretary as shall enable him to bring the matter before the Council."

the following:—

"No question shall be discussed or motion be made relative to the direction and management of the concerns of the Society at other than ordinary and annual general meetings, and then only at ordinary meetings after such notice to the Secretary as shall enable him to bring the matter first before the Council, and after due notice has been given to the members of the Society."

8. To amend Schedule B, which reads:—

"B.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

"Sir,—I have the honour to inform you that on the day of , you were elected member of the Royal Photographic Society of Great Britain.

"According to the rules of the Society you are required to pay the sum of £ , being within one month after your receipt of this notice, otherwise your election will be void. These conditions being complied with you will be considered as admitted into the Society, and any publications or notices to which you are entitled will be forwarded according to your directions.

"Under the 15th Article of Association you may compound for future annual subscriptions by the payment of £10 10s., if all subscriptions then due from you are paid.—I am, Sir,"

in accordance with the proposed alteration of Article 15, by substituting for the last paragraph the following:—

"Under the 15th Article of Association you may compound for future annual subscriptions by the payment of £10 10s. in addition to the entrance fee, or at any time if the subscription due the previous year is paid."

THERE will be a second extraordinary general meeting at 7.30 o'clock p.m., in pursuance of a requisition, at which the appended resolution will be proposed to be passed with or without modification as a special resolution, with a view to amending the Articles of Association of the Society:—

To amend Article 37, which reads:—

"All nominations must be sent to the Secretary not less than twenty-five days before the annual general meeting. A balloting paper containing no names but those of the members nominated and eligible to serve and their nominators, shall be sent to every member of the Society at least seven days before the annual general meeting, with instructions to erase all names of members nominated except those for whom he desires to vote. Every balloting paper shall be invalid on which more than one name as President, four names as Vice-Presidents, one name as Treasurer, and twenty names as ordinary members of Council are left unerased, or where there is any indication of the identity of the voter. The balloting paper shall be placed in an envelope provided for the purpose, which shall be enclosed in another envelope bearing the voter's signature, and forwarded to reach the Secretary not later than noon of the day preceding the annual general meeting. The Secretary shall place such envelopes unopened in the hands of the scrutineers, who shall reject any papers received except those from members entitled to vote, and shall announce the result of the election before the close of the annual general meeting. If the votes in any case are equal, the Chairman shall give a casting vote. Votes given to any member nominated in two capacities, and not elected to the higher, shall be counted to the next office, but no balloting paper shall be allowed to count as recording more than one vote for any nominee,"

by the omission of the words "and their nominators," on the third and fourth lines.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION: FORMATION OF A LIVERPOOL BRANCH.

A MEETING of the professional photographers of Liverpool and district was held in the rooms of the Liverpool Amateur Photographic Society, Eberle-street, on Friday evening, for the purpose of forming a local branch of the Professional Photographers' Association. Mr. G. Watmough Webster presided, and amongst those present were Messrs. F. A. Cooper, Richard Brown, A. S. Law, John C. Cubbin, T. Vanderbilt, F. S. Bain, W. Warrington, A. Priestley, T. B. Platt, W. T. Smith, S. M. Hibberd, Thomas Foulds, P. M. Minshull, T. Neville, A. Johnson, G. Latimer, W. Brooks (Manchester), H. A. Morrison, T. Birtles (Warrington), N. N. Cooper, A. F. Mowll, J. Sawnie, D. B. Seaman, W. Simpson, W. Knight, J. Cooper, W. B. Beaton, J. M. Dullihan, and W. H. Pugh.

At the outset the Chairman explained the object of the meeting, and proceeded to read the appeal issued by the Professional Photographers' Association. He said that they, in Lancashire, had the reputation of doing things well, and, if the branch was formed, there would be no doubt about its success.

Mr. Mowll, who acted as Hon. Secretary, then read telegrams and letters expressing inability to be present from Mr. Gowden, Mr. A. Ellis, Mr. Hartley, Mr. A. S. Medrington, Mr. G. E. Thompson, Mr. C. Howley, and Mr. T. C. Turner. Remarking upon the object of the gathering, Mr. Mowll said that out of about 95 professional photographers in Liverpool and district, less than 20 were members of the Association. That was a very small percentage. He believed that the Society would not live if Liverpool and other large towns did not support it properly. To form themselves into a branch was to do each other good in many ways. They would be united. The amateurs of the district could meet together in those rooms, and yet there was a large number of professional photographers in Liverpool, one-half of whom did not know the other half. He did not know more than half a dozen of the gentlemen present. He was confident that if the movement was fairly started, the branch would be a success.

Mr. T. Birtles remarked that if they, as photographers, intended to maintain their position they would have to combine. There were many things they did not like, and there was no remedy unless they acted as one body. Union was strength. It was a disgraceful state of things that there were 100 professional photographers in Liverpool and district and no sign of any cohesion. Such a state of things would have to be altered. He condemned the present system of touting, and said the question of discounts would have to be tackled soon. Concluding, he appealed to his brother professionals to join the Association for the sake of unity.

Mr. T. H. Taylor drew attention to the present action of the Liverpool "Daily Post" in offering enlargements at a stated sum. He would like a resolution of protest sent to that paper. It was simply cutting the throats of the photographers of the town, and he thought it should go forth that the professionals of Liverpool condemned the action of

the "Daily Post" in offering for sale enlargements at the sum of 6s. 6d.

Mr. Birtles thought that it would be a better policy for the "Post" to look after its circulation, and leave photography alone.

The Chairman explained that the branch, if formed, would take into consideration these questions.

Mr. Taylor asked if the Association intended to elect its members on the same lines as doctors, dentists, etc., were elected.

The Chairman said it would be impossible at present to do such a thing. They first of all wanted cohesion amongst photographers. He agreed with Mr. Birtles in regard to touting, that that was a matter to be fully considered in the near future. Another matter was the offering of enlargements by newspapers. The public were informed that a two-guinea picture could be obtained for six shillings. He was sure photographers could not get the former price. It was, he thought, a question of obtaining orders under false pretences. Speaking of plate-makers and their discounts, he was convinced an alteration would soon have to be forthcoming.

Mr. A. Priestley thought the time had come when they should be banded together in order to help the profession as a whole.

Mr. Mowll pointed out that the branch could not actually come into existence that evening, because the names of the gentlemen willing to join would have to be submitted to the London society.

Mr. Birtles said the branch could be formed, subject to the acceptance of all the names.

Membership forms having been handed to each person and filled up, Mr. Mowll announced that thirteen members had been enrolled.

The Chairman said it was very satisfactory that the membership of the Society had been increased by thirteen. He then formally moved that they constitute themselves into a local branch.

Mr. F. S. Bain seconded the motion, which was carried with acclamation.

After a little discussion it was resolved to elect two officers.

Mr. Richard Brown proposed, and Mr. Morrison seconded, a proposition that Mr. Webster be the Chairman for the ensuing twelve months. This was unanimously carried. In thanking them for electing him as their Chairman, Mr. Webster said he would do his best for the Association.

On the motion of the Chairman, seconded by Mr. Priestley, Mr. A. F. Mowll was elected Hon. Secretary. Mr. Mowll returned thanks for his election. He said arrangements would have to be made as to the place of subsequent meetings. They were now 31 strong, and he hoped that that number would be doubled before the new year.

The thanks of the members were tendered to the Amateur Photographic Society for the generous placing of their rooms at the disposal of the professional photographers. The meeting concluded with a vote of thanks to the Chairman and Hon. Secretary. Testimony was borne to the untiring energy of Mr. Mowll in engineering the whole scheme.

News and Notes.

THE Aintree Photographic Society have just handed over £9 11s. 10d. to the Stanley Hospital, Bootle.

LONDON and Provincial Photographic Association.—On Thursday, December 12, Mr. E. T. Harris will read a paper, "Essentials for Success in Albumenised Paper Printing," at the White Swan, Tudor-street, E.C., at eight o'clock; visitors are always welcome to the meeting.

THE Croydon Camera Club's fifth Exhibition will be held February 19 to 26, 1902. Entry forms will be ready in a few days. All communications respecting the exhibition should be addressed to Mr. W. H. Rogers, Exhibition Secretary, 46, Bensham Manor-road, Thornton Heath.

PROFESSIONAL Photographers' Association.—The members' meeting of the Association will be held at the rooms of the Royal Photographic Society, 66, Russell-square, London, W.C., to-night (Friday), Dec. 6, at 8 o'clock, to receive report of the work done by the Committees since October 4.

ROYAL Photographic Society.—Ordinary Meeting, Tuesday, December 10, at 8 p.m., at 66, Russell-square. Major-General J. Waterhouse will read a paper on "The Genesis of Tele-photography." It is expected that an exhibition of Mr. Henry Stevens' photographic work will also be opened.

"A TRIP up the Rhine with the South London Photographic Society" was the subject of a lecture delivered before the members of the Woolwich Photographic Society on Thursday, November 28. The lecture, which was a most interesting and amusing one, was illustrated with over two hundred slides. The attendance was 140.

THE cinematograph entertainment recently given before the Court at Balmoral, by Royal command, was repeated by Messrs. Elrick and Fraser, Edinburgh, before a special meeting of the Edinburgh Photographic Society on Saturday night last. The audience was large and appreciative. Mr. C. Dods contributed suitable musical accompaniments.

THE song-writers of Paris have at last succeeded in getting their mortal enemy under lock and key. The greater the success of a song, the less the sale. When they went to the office of their Society in the Rue Chaptal, they found about fourpence royalties waiting for them, after they had taken a pair-horse brougham from the Grand Hotel to collect it. It turns out that a man had invented a perfect printing and photographic reproducing machine that enabled him to take a song, even with a coloured cover, and sell it at a penny apiece to the hawkers, while the trade price was two francs.—"The Referee."

THE Royal Society.—At the anniversary meeting on Saturday last medals were presented as follows:—The Copley medal to Professor J. Willard Gibbs, For. Mem. R.S., for his contributions to mathematical physics; a Royal medal to Dr. William Thomas Blanford, F.R.S., for his work in connection with the geographical distribution of animals; a Royal medal to Professor William Edward Ayrton, F.R.S., for his contributions to electrical science; the Davy medal to Professor George Downing Liveing, F.R.S., for his contributions to spectroscopy; and the Sylvester medal to Professor Henri Poincaré, For. Mem. R.S., for his many and important contributions to mathematical science.

THE Queen and the Newbury Exhibition.—The Newbury Photographic Exhibition on January 29, 30, and 31 has been highly honoured, for it has secured the special patronage of Queen Alexandra. In addition to this, the Princess Christian has marked her interest in this exhibition by sending a series of seven charmingly taken photographs which her Royal Highness has prepared specially for Newbury. The exhibition will certainly be held under very distinguished auspices, and the active interest of many prominent authorities like the Autotype Co., the Kodak Co., Mr. T. R. Dallmeyer, Sir H. Trueman Wood, Mr. Horsley Hinton, Bolas, and others will materially help it forward. It should not be forgotten that there are eight open classes and valuable prizes.

THE Poisons Committee appointed by the Lord President of the Council to inquire whether any alterations may be expedient in Schedule A of the Pharmacy Act, 1868, sat at Whitehall recently to take evidence. Sir Herbert Maxwell, M.P., was in the chair, and the other members of the Committee present were:—Mr. A. Cross, M.P., Professor T. E. Thorpe, Professor W. A. Tilden, Dr. Stevenson, Mr. William Martindale, and Mr. J. H. Harrison, Deputy Clerk of the Privy Council, with Mr. E. B. Masham as Secretary. The following witnesses were examined:—Mr. G. T. W. Newsholme, President of the Pharmaceutical Society; Mr. C. B. Allen, Vice-President of the Pharmaceutical Society; Mr. W. Gowen Cross, Shrewsbury, and Mr. Michael Carteighe (Dinneford and Co.), members of the Council of the Pharmaceutical Society; Mr. J. W. Sutherland, of the firm of Fraser and Green, chemists, Glasgow; Mr. R. F. Crawford, of the Board of Agriculture; and Mr. W. G. Whiffen, manufacturing chemist. The Committee subsequently adjourned to December 17.

SOUTHAMPTON Camera Club.—Since the recent very successful exhibition held in connection with the above Club, the membership has been largely augmented, and the result was plainly seen by the splendid meeting held at their headquarters at the Philharmonic Hall on the 25th ult., when a lecture was delivered by Mr. W. D. Welford, F.R.P.S., who chose for his subject "Improving Negatives and Prints, Pictorial and Decorative Work," with special reference to the Warwick plates and Austin-Edwards films. The Lecturer clearly illustrated that, perhaps not in apparatus, but certainly in material, the picture-worker wants as much done as possible—that is, the better the plate or film, the less he has to do, the greater freedom from monotony as to process, and the more scope for brains. He can, if he is sure of his plate or film, devote his whole attention to the picture itself. The mere chemical side, as illustrated by development, has no pleasure for him—he likes that done in the camera in most cases, though not all, of course. Mr. Welford made it quite clear that there are occasions when faking in developing is necessary.

ALLEGED Frauds by a Builder.—On Saturday last George Hypolite Le Bluff, builder, was charged, on remand, at Greenwich Police Court, with obtaining money by false pretences. The allegation against prisoner was that he had received sums of money from several people with orders for greenhouses, which were never delivered. Detective-inspector Kyd said previous to prisoner's arrest he had received numerous complaints about the Straightsmouth Portable Co. When witness saw accused he asked him who Mitchell was. Prisoner replied that he advertised in that name, as the name of Hypolite stank. There was only a temporary erection at the works, viz., a roof on poles. About a dozen hands were employed, but they generally seemed to be playing about. There was a considerable quantity of wood and wooden buildings in process of construction. On witness asking prisoner for the books of the firm, the latter produced copy books and a number of memorandum books. There was a considerable correspondence, largely consisting of complaints from people who had sent money and cheques. There were 232 names of people who had sent money to the amount of £590. There was a bank pass-book in the name of Mitchell. There were further copies of advertisements in the name of Mitchell with nineteen different varieties of initials and Christian names. Witness also found letters from seven papers and periodicals stating that they were stopping advertisement on account of complaints from people who had sent money. The case was formally remanded with a view to prisoner being committeed for trial at the Sessions.—"People," December 1, 1901.

DELEGATES from the photographic societies at Blaydon, Bishop Auckland, Durham, Gateshead, Newcastle, South Shields, Sunderland, and the Tyneside Geographical Camera Club, met at Newcastle-on-Tyne on Wednesday, Nov. 27, 1901, for the purpose of considering the formation of a Federation of the Photographic Societies of Northumberland and

Durham. Mr. J. Davenport was elected to the chair. Mr. Arthur Payne proposed the following resolution:—"That, in the opinion of the delegates here assembled, acting on behalf of their societies, it is considered advisable to form a Federation to be known as the Federation of the Photographic Societies of Northumberland and Durham, and having as its object the diffusion of photographic knowledge." In the course of his remarks Mr. Payne pointed out that this Federation would not clash with any similar organization. That the various advantages to be obtained by amalgamation included the interchange of lectures, loan collections of pictures, lantern slides, etc., the holding of a large annual exhibition, open to the members of the federated societies, which would be held in the various centres in rotation, the institution of an annual picnic, open to the whole of the members of the federated societies, the procuring of various privileges for members of the Federation, and the institution of classes in private Society exhibitions open only to members of the Federation. The resolution was seconded by Mr. Thos. Spark, and supported by Messrs. Mail, Hewitt, White, Cluff, and Hastings. Upon being put to the vote, the resolution was carried unanimously. The delegates afterwards held the first meeting of the newly formed Federation. Mr. J. Davenport was elected Chairman, and Mr. Arthur Payne, 5, Tynevale-terrace, Gateshead, Hon. Secretary, the subscription being fixed for each Society at 10s. per annum.

Artificial Light in the Studio.—Under this title Mr. A. G. Adamson, the well-known expert, gave a practical demonstration at the Memorial Hall, Manchester, on November 29, of his improved incandescent electric lamp, and of a new acetylene lamp which his firm have just put upon the market. The meeting was well attended, and Mr. Adamson was assisted by Mr. Von Doicy, manager at Mrs. Fred Wilkinson's studios. In the course of the demonstration a portrait of a lady in classic costume was made on a 15×12 plate, and, although the lens was stopped down to f-11, there was slight over-exposure at five seconds. The lamp used was the medium one (known as No. 2 Lamp), and the illumination was soft in the highest degree, and carried with perfect equality over the whole field of view. Several other interesting studies were made, and, after carefully explaining to his audience the whole working of the apparatus, pointing out its extreme simplicity, perfect silence, steadiness, and ease of control, cheapness in working (twelve full cabinet exposures being had for the cost of one penny in electric current), and the long life of the special lamps, Mr. Adamson emphasised in a striking manner his previously expressed opinion regarding the superior value for portraiture of a light richer in the lower refrangible rays than the electric arc, magnesium, and other so-called white lights by asking Mr. Von Doicy to make a 15×12 head study of a gentleman from the audience with the light maintained at half its usual power (in fact, markedly yellow) in order to demonstrate that at only a slight expense of speed in exposure the colour values of the face could in this way be so accurately reproduced as to entirely obviate the necessity for retouching even in so large a head. The result was most satisfactory, and fully bore out every expectation. The same stop, f-11, was used as in the former case, and the exposure was quite full at 25 seconds. There was not time to make any exposures by the acetylene lamp, Mr. Adamson contenting himself by lighting it and showing its working. The new generator is of the smallest possible size, 6 in. high by 4 in. long and 4 in. wide. It is fed by inserting small cartridges, and the gas passes direct to one or other of two small bags, when one is filled a fresh cartridge is inserted, the stop-cock reversed, and the other bag fills whilst the first one is being used to feed the burners. All danger of over-accumulation of gas is entirely avoided by the quantity of calcium carbide in each cartridge being just sufficient on decomposition to fill the bag. The burners are twenty-one in number, arranged in a ring, and adapted to the present pressed incandescent gas apparatus, which is already well known, or the very neat and light folding apparatus shown at the demonstration, made up in a case 4 inches diameter by 3 feet 6 inches long, and a small box, the whole only weighing about fifteen pounds. The photographic value of acetylene gas is already well known, and this very novel and safe method of adapting it for portable use should open a new field for both professional and amateur. —Communicated.

Balloon Photography at Great Altitudes.—One of the most useful accessories of the modern aeronaut is the photographic camera, for, by its use, he is enabled to place before the world reproductions—meagre and inadequate it must be confessed—of the extended panoramic views and glorious visions which are ever before his lofty gaze. The Frena camera which I carry contains forty films on celluloid, packed flat like a pack of cards, and I am enabled to expose and develop any number of these as circumstances require. The advantages of films over glass plates for balloon work are obvious: the saving of weight, the absence of danger of breakages at a breezy descent, and the very large extra number of pictures which may be taken are all in their favour. In photographing views on the ground, the aeronaut has to use his discretion in the selection of the subject; and, moreover, pay attention to the foreground, the middle distance, and the far distance, in order to secure a pleasing result. To one uninitiated in photographic work an open position with undulating hills and a view as far as the eye can reach might appear a splendid subject for a photograph, but the experienced picture-maker would avoid such a view, and select one in which the foreground and middle distance contained some object of interest. The balloon photographer, however, has no such discretion. As soon as the balloon leaves the earth the picture becomes a distance one: he can snap one or two views at the very start, and afterwards he has distance only, the grandest view it is possible for mortal eye to see, the horizon extending for 20 miles or more, but everything in diminutive proportions. He becomes a student of distance photography only, he studies the light and shade, and looks out for interesting features to include in his pictures, and his object is to secure interesting "bird's-eye views." With this object in view the most important consideration is the altitude and the clearness of the body of atmosphere through which the photograph is to be taken. In a misty state of air one may expose a picture at a low altitude, a few hundred feet, and obtain a result, whilst at a few thousand feet the result on the film would be absolutely nil, the reason being that at the small height the picture itself reflects sufficient active light to produce the impression, whilst at the great height the mist intervening reflects the light, and is photographed instead of the view of the earth. To the human eye the view may be possible, but to the eye of the camera all is blank. In a clear air photographs are practicable as high as the balloon can ascend, and it only becomes a question as to whether any suitable subject for the purpose lies beneath. For instance, in a balloon trip across the English Channel, one may be for hours at a height of thousands of feet in sight only of the sea beneath, a very fine situation undoubtedly, and one which gives ample opportunity of speculative considerations. Where are the vast fleets of steamers which ply continually? where are the ocean-going vessels? where even the humble fishing craft? Nothing to be seen but the deserted waters for the whole range of view. Even if an occasional boat passes in sight it forms no subject for such a distant photograph, but when one crosses the shore and passes over dockyards, piers, buildings, and rivers, there certainly are the subjects for snapshots from the eagle eye of the Frena. For such a subject one gives a rapid exposure, say, one-fortieth or one-eightieth of a second, and uses a small stop to the lens, say, f-32. The exact details grow on one instinctively, and vary with the time of day and of year, and in the after process of developing the latent picture one gains experience for future work.—Percival Spencer in the "Aeronautical Journal."

Commercial & Legal Intelligence.

Messrs. Sichel & Co. inform us that the installation of the Morgan electric light at their showrooms (20, Berners-street) is now ready. They invite photographers to view and test the installation.

Messrs Brnder and Co., have just erected a new electric plant in their enlarging works, 242, London-road, Croydon, in order to cope with increase of business. They hope they will be able thereby to avoid disappointments often casued through pressure of work before Christmas.

Trade Libels in Advertisements.—There is a certain kind of libel which, in days when advertising is carried to extremes, is well calculated at times, says "Engineering" to do serious injury to those who are engaged in the multifarious industries of the country. High praise of one's own sometimes merges into disparagement of another's manufactures. It is at this point the law steps in, and, subject to certain conditions, decrees that advertisements of this undesirable character must be suppressed. Yet the judges are chary of interfering with the right of a man to use every means to exaggerate the value of his own goods. Certain cases clearly establish that where a plaintiff seeks to recover damages for, or to restrain the publication of, a trade libel, he must prove legal malice on the part of the defendant, and he must also establish the fact that he has suffered actual pecuniary loss traceable to the defendant's wrongful action. The nature of the words which will constitute a libel upon persons in the way of their trade is well illustrated by cases quoted in "Engineering." A judgment was affirmed in the House of Lords, when it was stated that "if the only meaning which can be reasonably attached to a writing is that it is a criticism upon the goods or manufactures of a trader, it cannot be the subject of an action for libel, but an imputation upon a man in the way of his trade is properly the subject of an action without proof of special damage." Thus, whenever A accuses B of knowingly and intentionally infringing A's patent or copyright, or imitating A's trade mark or brand, or using A's firm name, or passing off his goods as A's this is a personal libel on B. But merely to state that B's patent is invalid, or that a picture which he sells is a piracy, is no libel on B personally, and is only actionable if the words be published falsely and maliciously, and special damage has resulted from the publication. The same principle applies to cases for what is called slander of title. Thus, it was decided that an action lies against a defendant who issues a circular stating that the plaintiff's invention "had ever been proved to be an infringement" of his own, when no proceeding had been taken to test its validity. For there was no ground whatever for the positive statement made and therefore clearly no reasonable or probable cause for making it. In another case the Court of Appeal laid it down that a statement by a trader that goods of his manufacture are superior to those manufactured by another rival trader, although untrue and made maliciously, is not actionable as a defamatory libel, nor does such a statement afford ground for an action for disparagement of goods, even if the plaintiff is damnified by it, and avers special damage.

Ilford, Ltd.—The fifth ordinary general meeting took place last week at Winchester House. Major-General G. F. Blake (the Chairman of the company) presided, and in moving the adoption of the report and accounts, said that the opening remarks which he had to offer to the shareholders were words of congratulation in regard to the amount of

the net profits. For the year under review they had earned, after payment of working expenses, directors' fees, income-tax, etc., a net profit of £53,725, which was about £500 in excess of the previous year. They had not, however, got through the year without a certain measure of stress and trial. The stress and trial that they had to face it was perhaps not wise to go into in detail, but it had been mainly in regard to unfair competition. He felt that the shareholders had every reason to be satisfied with the result shown in the accounts in face of the extra expenditure which the company had had to meet in various ways. In taxation, both local and Imperial, there had been increases, and also higher charges in other ways. To go into figures, they had had in the district rates an increase of 10 per cent., in house duty and property tax 50 per cent., and in gas 10 per cent. The price of raw materials, and especially one chemical they used in large quantities, but which he would not name, had gone up considerably. If it had not been for these exceptional charges against them the profits would undoubtedly have been larger. As to the disposal of the available balance of £56,390 shown in the accounts, the directors had already paid an interim dividend on the ordinary share capital for the half-year ended April 30, 1901, at the rate of 8 per cent. per annum, free of income-tax, absorbing £7,600, and for the same period they had paid the dividend on the 6 per cent. preference shares, amounting to £5,700. Since then the second dividend on the 6 per cent. preference shares had been paid. From the balance they recommended that on the ordinary share capital a dividend be paid for the half-year ended October 21 last at the rate of 12 per cent. per annum, and, in addition, a bonus of 2½ per cent., making, with the above interim dividend, a distribution of 12½ per cent. for the year. This would absorb £16,150. On the profit-sharing scheme £821, more or less, would be paid as bonus to the employees. Of the balance, £20,419, the directors recommended that £8000 be written off goodwill, processes, etc., that £8000 be placed to reserve, and the balance, £4419, carried forward. He felt that the shareholders would approve of the policy of the board in making very ample depreciation, so that the company might continue to rest on a thoroughly sound financial basis. A glance at the list of investments in the report would, he felt, satisfy the shareholders as to their value. Since 1898 they had invested in stocks the large sum of £73,120, and they had also invested since that date £5300 in freehold land. The item of "stock at valuation" was taken in their accounts at the prime cost. While he admitted that they might have made a larger profit by investing in other securities than those they now held, he felt that the course they had adopted in having only the highest class of investments possible would commend itself to the shareholders, and that the directors would not be scolded for what they had done in this matter. The increase of salaries given to various loyal and hard-working employees would, he felt, also command approval. Proceeding to deal with the business generally, he expressed the view that the Ilford productions were highly appreciated. He knew that he was treading on somewhat delicate ground when he made reference to certain competitors who conducted business on what he scarcely considered proper lines. This company was, he asserted, ready to meet and to beat, if it possibly could, fair competition, but it was not prepared to enter into the system adopted by certain people of giving high and extravagant discounts to obtain trade. The company knew the value of its goods, and was quite ready to give a right and liberal discount, but the directors would on no consideration follow in the steps of those competitors to whom he referred. As to the bad debts, they were again at a ridiculous figure, only £2 4s. 5d., and he had no doubt that in a day or two the Secretary would inform him that even that little sum had been paid off. The shareholders would be well aware of the interim dividend that they had paid, and he wanted to explain to them that, after careful consideration, and looking at the fact that, with the continuance of this unhappy war, the income-tax might go up even beyond the present figure of 1s. 2d. in the pound, the directors had come to the decision that they would cease the system of paying the dividend free of income-tax, but it would be some solace to those who objected to this step to be asked to accept a bonus on this occasion—he was most anxious that it should not be called a dividend—of 2½ per cent. Continuing, he made further reference to the very high character of the Ilford goods, and said that if it were needful in the future to make any large extensions beyond what they provided for in the regular course of things they had an abundant reserve. He feared that in his peroration he would be incurring the wrath of their very able managing director (Mr. Edward B. Knobel) by making reference, in that gentleman's presence, to the valuable services that he had rendered to the company. He (the speaker) forewent the pleasure of making those remarks on the last occasion, richly as they were deserved, but he declined absolutely to do so on the present occasion, and he must tell the shareholders that it was due to the untiring energy of Mr. E. B. Knobel that the company had achieved the result that it had done. It had been with the greatest difficulty that he (the Chairman) had induced Mr. Knobel to take even a brief holiday from the work of the company, and he only finally consented on its being clearly pointed out to him that by looking after his own health he would at the same time be best serving the interests of Ilford, Ltd., which he had so keenly at heart. In conclusion, the Chairman invited questions from shareholders, and moved the formal resolution as follows:—"That the annual statement of accounts and balance-sheet and the reports of the directors and auditors be, and they are hereby, adopted, the dividend declared, and the bonus paid in accordance therewith." Mr. Charles J. Cox (Deputy Chairman) seconded the motion, and referred in eulogistic terms to the excellence of the bookkeeping in the office. This had, he said, so facilitated the work of the auditors that the report was ready within thirteen days of the date of the closing of the accounts. There was no discussion, and the resolution was put and carried unanimously. Mr. C. J. Cox then moved the re-election of Major-General G. F. Blake (the Chairman) as a director of the company. The motion was seconded by Mr. E. B. Knobel (the managing director), and agreed to, and the Chairman briefly returned thanks. The Auditors, Messrs. Turquand, Youngs, Bishop, and Clarke, were re-appointed at a remuneration of 100 guineas for the ensuing year. A cordial vote of thanks to the Chairman and directors closed the meeting.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject
9...	Croydon Microscopical	Mr. Rudler's Tenth University Extension Lecture.
9.....	Southampton	Lantern Slide Competition: *Architecture.*
10.....	Ashton-under-Lyne.....	Social Evening
10..... ..	Birmingham Photo. Society ...	Lantern Lecture: *Rambles around Stechford.* G. Wilkes.
10.....	Leeds Photo. Society	*The Story of a Streamlet.* Percy Lund.
10.....	Newcastle-on-Tyne	*Lens Testing.* Dr. Blacklock, M.D.
10.....	Stonehouse	Business Meeting.
11.....	Borough Polytechnic	*Elementary Photographic Optics, with Special Reference to Supplementary Lenses* J. McIntosh.
11.....	Croydon Camera Club	*Spark Photography.* C. E. K. Mees.
11.....	Photographic Club	*The Transitional Elements in Photography.* T. Thorne Baker.
11.....	Redhill and District	Beginners' Night: A. H. Dunning.
11.....	Southport	Lantern Night.
12.....	Darwen	Prize Slides.
12.....	Liverpool Amateur	Discussion on Photographic Mounts.
12.....	London and Provincial	Open Night
12.....	North-west London	*Orthochromatic Photography.* E. S. Shepherd, F.R.P.S.
12.....	Richmond	*Photographic Facts, Interesting and Amusing.* F. O. Bynoe.
13..... .	Borough Polytechnic	Instruction Evening: *Trimming, Mounting, and Framing.* F. W. Bannister.
13.....	Bognor	Monthly Competition: *Still Life.* Negatives for criticism.
13.....	Croydon Microscopical	Demonstration: *Synthol.* E. S. Baralet.
13.....	Plymouth	Special Evening: *A Review of the Royal Photographic Society's and Salon Exhibitions of* 1901. H. S. Hill.

ROYAL PHOTOGRAPHIC SOCIETY.

TECHNICAL Meeting, November 26,—Mr. H. Snowden Ward in the chair.

THE BECK-STEINHEIL ORTHOSTIGMAT.

Mr. F. O. Bynoe showed some specimens of the work of the new Beck-Steinheil orthostigmat lenses, the whole-plate lens being used in every case upon a 12×10 plate, sometimes with the rising front in use. The subjects were such as to severely test the defining and covering power of the lens. Mr. Bynoe went into the question of astigmatism in a lens somewhat deeply, and explained by diagrams what occurred when a lens that was not corrected for astigmatism was employed. It was very important in process work to have a lens corrected as far as possible for astigmatism, and this point he thought was satisfied by the Beck-Steinheil orthostigmat.

Mr. C. P. Butler said he had tested the lens on the stars, and found it very perfect. He spoke of the star test as the best and final to be applied to a lens, as one could detect errors much better from a circular image than any other figure. The distortion was at once made apparent by the elongation of the circles.

A NEW COLOUR CHART.

Mr. E. Sanger Shepherd passed round a new colour chart he had devised. Upon a ground of vermilion red was placed a circular piece of lemon yellow, and in the middle of this semi-circular patches of emerald green and French ultramarine blue, the green patch being finally furnished with an alizarine crimson star, and the blue patch with a white diamond-shaped patch. A number of photographs of this chart was taken and shown on the screen: (1) Upon an ordinary plate (Ilford), with no screen; (2) upon a spectrum plate, without any colour filter; (3) upon the same plate with the Gilvus filter; and (4) upon the same plate with the Absolutus filter. The series showed in a very instructive manner the progressive orthochromatism from the ordinary plate to the colour sensitive plate with the screen. In the first example only the white and blue patches had affected the plate, but in the succeeding examples the other colours were seen to have affected the plate more or less until, in the last case, one found the monochrome slide accurately representing the luminosities of the chart—the blue at the bottom of the scale, and, next in order the crimson, the vermilion, the green, the yellow, and the white. These colours, in the tints given on the chart, were not often found in nature, but they afforded a combination which was in itself a severe test, and one that could not fail to be appreciated by an audience desirous of learning the different colour sensitiveness of our plates. **The colours were by Winsor and Newton.**

PHOTOGRAPHY WITH "CRESCENT" APERTURES.

Mr. John C. Warburg showed some photographs taken with crescent-shaped apertures and no lens, and one with a pin-hole for comparison.

His idea was to ascertain whether the effect of long brush marks similar to those of Claude Monet could be reproduced. The results, with a fine crescent, five-sixteenths of an inch long, showed a loss of detail, and to a less extent of structure. An aperture one-tenth inch long did not suffer in this way so much. Mr. Warburg suggested that the method might be employed for broad effects, to the exclusion of unnecessary details, yet preserving the general form. There was no difficulty in seeing that the image was composed of crescents of light instead of points.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 28,—Mr. R. J. Kindon in the chair.

Mr. J. C. H. Wallsgrove showed some flower studies, the prints being by the platinotype process. Special interest attached to the exhibit because they were of a duochrome nature, the background being solarised and of a brown colour. He explained that the prints were straightforward prints from single negatives, and bath developed, as distinct from glycerine developed. The duochrome effect on platinum paper obtained by Mr. Stieglitz, of New York, was one obtained by mercury and glycerine treatment, and was not to be confused with this method. Mr. Wallsgrove did not volunteer any information as to the production of the special negative, but various suppositions were voiced by the meeting.

Mr. W. Thomas took it that the background was practically clear glass.

Mr. A. Mackie assented, and asked how one could avoid the effect, because one often got it when it was not wanted.

Mr. R. Child Bayley said it would be interesting to know whether the effect could be secured in any part of the image, and not necessarily in the deepest shadows—in other words, whether brown half-tones could be got instead of brown shadows.

Mr. S. Herbert Fry believed that there was nothing special about the negative except that the portion that was required to print brown was clear, and allowed the paper to solarise.

Mr. Thos. K. Grant gave a lecture on

The Lumiere Process of Colour Photography.

At the outset he said that all indirect processes of colour photography, such as this, found their origin in the theories advanced in 1861 by Clerk Maxwell. The work that had been done in recent years had been by way of perfecting the application of this theory by providing materials that could not be obtained when the theoretical investigations were published. The Lumières set themselves against the pronouncement that an universally sensitive plate was best, as they held that such a plate could be but a compromise. Accordingly they adopted three plates, each specially sensitised for its particular work. These plates are the Lumière orthochromatic Series A, for use with the green filter or red printing plate; the Series B plate, for the orange filter or blue-printing plate; and the Blue label plate, for the blue filter or the yellow-printing plate. For the first-named plate weak red light is safe for development, but the two other plates require a faint green light. The screens used consist of plates of optically worked glass, coated with gelatine, and afterwards stained with the following dyes:—The green screen is dyed with methylene blue N and auramine G; the blue-violet screen with methylene blue N; and the orange screen with erythrosine and metanile yellow. The exposure required, taking 1 as the unit for the blue-violet screen on the extra-rapid plate, will be 12 times for each of the other screens. A full range of gradation in the negative is very essential, and there should be no discoloration. A baryta paper is mounted on a glass plate and coated with a collodion in a special manner. This paper is sensitised with a mixture of gelatine, ammonium, bichromate, etc., and after drying is stripped from the glass. This sensitive paper is printed as in the carbon process, an actinometer being used to time the exposure. Development is effected in the usual manner, the paper being attached to a collodionised plate, the result being three gelatine images in slight relief. These colourless positives are subsequently stained in their respective baths of red, yellow, and blue; the green screen image in the (red) erythrosine bath; the orange screen image in the (blue) diamine bath; and the blue-violet screen image in the (yellow) chrysophenine bath. An immersion of twelve hours is usually enough, but it rarely happens that the intensity of the colouring is just correct. Either reduction or intensification must be resorted to before a satisfactory result is attained. Various means are prescribed for reducing and adding colours, into which we cannot fully enter here. The three images are then coated with a rubber solution, and finally with collodion before the films are temporarily transferred to paper for ultimate transfer to and superposition on glass. A number of fine examples were shown on the screen, and a short discussion ensued.

PHOTOGRAPHIC CLUB.

November 27,—Mr. J. R. Gotz in the chair.

Mr. F. A. Bridge said that he was asked by Mr. York to present in his name to the Club a portrait of himself. Mr. Bridge remarked that it used to be a custom for every member to put his photograph in the Club album. He was sure that the photograph of so well-esteemed a member of the photographic world would be well received, and he hoped before very long to see the photograph hanging upon the walls.

Mr. Lewis Medland gave an illustrated discourse on

Through Boerland in a Bullock-wagon.

The lecture was in no way concerned with the present war in South Africa, except in so far that the ground covered has since been made famous by many a battle or brush with the enemy. The notes were taken from a journal kept by the lecturer about the year 1874, when he travelled through the Colony, Natal, Orange Free State, and the Transvaal. Sheep-farming and ostrich-farming, etc., engaged his attention, and formed the centre of a number of anecdotes. An old map that was shown exhibited a state of things very different to that obtaining now in South Africa. The Dutch were only beginning to gain a foothold, and there were very few places marked on the map, compared with the modern map. The voyage out on the old "Windsor Castle," the arrival at Table Bay, with the background of Table Mountain, 3500 feet high, and other incidents were pleasantly described, and interspersed amongst the pictures were photographs of the animals that are peculiar to the country traversed. The route followed crossed the Tugela river, the Mooi river, past Colenso, the Drakensberg mountains, Ladysmith, Laing's Nek, and many now famous spots. Mr. Medland's dealings with the Boers as a friendly people had an additional interest in view of the present strife that might not otherwise attach to them. The return journey was made via the diamond city, Kimberley, and Mr. Medland also showed some pictures of mining for diamonds and gold. Altogether the lecture well deserved the hearty reception that it met with.

On December 11 Mr. T. Thorne Baker reads a paper on "The Transitional Elements in Photography." Visitors will be heartily welcomed at Anderton's Hotel, at 8 p.m.

Croydon Camera Club.—Wednesday, 27th ult., was devoted to a display of members' lantern slides. The President (Mr. Hector Maclean, F.R.P.S.) after alluding to the forthcoming exhibition, and urging members not to be behind time in getting ready for it, opened the ball by exhibiting some capital focal plane studies, taken with the Anschutz hand camera, fitted with a Goerz lens, these being a continuation of a series shown on a previous occasion. With a focal plane shutter very short exposures can be given, down to a one-thousandth part of a second. Under these conditions, motion may literally be said to have been arrested, the results being invariably interesting, and sometimes grotesque to the eye, which can only receive an average impersion of a rapidly moving object. Mr. Harper's contributions, chiefly river scenery, and Mr. Dapple's Alpine views, deservedly met with general approval, and the slides exhibited by Messrs. Allen, Aris, and Rogers all kept up a high standard of excellence, which was maintained throughout the evening.

Cornish Camera Club.—On Monday evening, November 25, the Cornish Camera Club held their annual supper at the Western Hotel, Penzance, Mr. W. E. Baily, C.C., Lynwood, the President, occupied the chair, and amongst the large number present were Councillor W. Colenso, Mayor of Penzance, Councillors R. Pearce Couch and G. P. A. Robinson, Messrs. H. Tonkin, Hon. Sec., W. R. C. Watson, W. MacGeorge, A. Pool, H. Stewart, W. H. Bailey, R. D. Boase, V. Crocker, H. Dale, F. W. Mitchell, Johnstone, H. Symons, M. Sampson, J. H. Benn, W. Colenso, Jun., J. Matthews, S. E. Beringer, A. W. Robinson, Hamilton, James M. Cornish, Wood, and Edward Uren, Drs. C. Branwell and Wilson, Messrs. J. Richards, T. Richards, G. W. Doughty, Barnes Richards, H. B. Geeson, Morrish, G. Phillips, J. Truscott, G. Sellers, Jun., O. Volk, Clarke, Hallo, C. L. Still, W. Lane, Barrett, Arthur Gale, J. Nicholls, A. Mitchell, H. Nankervis, P. Smith, W. Nye. H. Bishofswerder, J. Branscombe, E. Hugo, B. Stephens, H. Bradbury, R. Smith, T. James, C. Beckerley, etc. In the course of the proceedings, Mr. Baily presented Mr. H. Tonkin (Hon. Sec.) with a handsome half-plate Dallmeyer stigmatic lens, and a framed testimonial, with the following inscription:—"Presented by the Cornish Camera Club to Mr. H. Tonkin, Jun. We, the undersigned, in appreciation of valuable services rendered by him during many years as Hon. Secretary, in recognition of the unselfish manner in which he has devoted himself to the interests of the Club, particularly at demonstrations, and as a mark of the esteem in which he was held by the members generally." Mr. Harry Tonkin returned thanks. He mentioned that during the 14 years since the Camera Club was formed he had given 126 photographic demonstrations, besides innumerable lantern entertainments and exhibits. After referring to the trouble and expense the President had put himself to in arranging lectures, the speaker went on to express his pleasure that the lens was not, as usual, made in America or Germany, but in England. Coun. G. P. A. Robinson proposed the "Cornish Camera Club," coupling with it the name of the President, Mr. Baily. He could not say much about photography, but he knew that during the past fifty years, and more especially the last twenty, a rapid advance had been made. He remembered, half a century ago, when he was four years of age, that his portrait had been taken on glass 1s. plain and 2s. coloured. Instead of being a trade, photography now was among the front rank of the arts and sciences, and it was only natural that in all the counties and towns photographic and camera clubs should have arisen, and being in the principal town in the county—there could be no two opinions about that—they possessed the premier club and had the best President, to whom they were greatly indebted for his scientific ability. Mr. W. E. Baily, responding, was sure he was very much flattered by the kind things said, not only about the Cornish Camera Club, but also for the way in which his name had been coupled with it. It was the Secretary to whom the success of the Club was due since its establishment. He confessed that there was little he was able to do to promote the welfare of the Club; still he did his best. It was the object of the Club to produce as good results as pos-

sible, and it was not for him to say how good those results were; he left that to the public. The members had produced pictures, some of them very good, and three seats from him was a gentleman whose enlarging they were proud of, and rightly too, though they would not be critical on these occasions. He trusted the Club would prosper, and that all would do their best to advance the casue of photography as much as possible. Photography was advancing year by year, and that made it all the more difficult to ascertain which was the best method of work. Some adhered to the old methods, others followed up everything new, while others followed a medium course, not going to one extreme or the other, and thought that, thus, they would get the best results. He would advise them to be discreet, for, it did not altogether depend on the apparatus or camera or lens. Some who spent £40, £50, or £60 on a camera did not get as good a picture as many who used a comparatively poor apparatus, costing a few pounds. He called it the science of photography, as they had to work and decide what was the best for a particular style of work. After giving his early experiences of photography, the President went on to remark that he believed a great many people who took up photography did so because they thought it was so easy and so simple, and then got disgusted because they found they could not do it; the reason was because they were not sufficiently careful, and he would issue a note of warning, not to members of the Club, because he knew they did not need it, but to their friends, to be particularly careful in every process. He trusted the Club would exist for many, many, years; they had kept it going since 1888, and he hoped it would continue and progress, for, apart from the artistic side of photography, for producing good and pleasant pictures, there was a great deal of education in it, which should not be despised even by those who had grown out of youth, and the study and practice might be of value to many.

Harrogate Photographic Society.—A number of amateur photographers in Harrogate have thought it desirable to form a photographic society, and several informal meetings have been held relating to the constitution of the Society. The officers consist of a President, three Vice-Presidents (the Rev. Canon Hancock, and Messrs J. Addyman and R. Peach), a Secretary (Miss Sutcliffe), a Treasurer (Mr. J. Backhouse), and an Hon. Lanternist (Mr. Thompson). The inaugural lecture was delivered by Mr. C. B. Howdill, A.R.I.B.A., of Leeds, on the "Photography of Colour." Mr. Howdill commenced with an explanation of light and colour vision and the practical application of the principles by Professor Clerk Maxwell. He drew attention to the fact that Du Hauron had suggested methods of colour photography in 1869. Since then nearly all investigators had attacked the problem of natural colour photography on his suggestions. He was the first to introduce a form of kromskop. He also prepared the first ruled screen now generally used in the Joly process. Again, he was first in producing a photograph in colour by the use of superimposed stained films. Mr. Howdill clearly explained the Joly process, and showed several slides prepared on this system. Amongst the most successful was an exterior of Ripon Cathedral, which had an exposure of twenty-five minutes on a slow spectrum plate, and another of Beverley Minster, both of which, when slightly thrown out of focus, gave an excellent effect. The opinion expressed by several was that the ruled lines give a certain mechanical appearance, as compared with the next process described. The Sanger Shepherd process was a method of colour photography consisting of superimposed films taken from negatives exposed through particular red, green, and blue screens, the films being stained in complementary colours. The process was fully illustrated by a series of seven slides representing the various stages up to the finished pictures. Amongst examples of flower subjects thrown on the screen, one of geraniums, taken in the gardens of New College, Oxford, was especially noticeable owing to a remarkable stereoscopic effect. In a basket of fruit the bloom on the grapes was most clearly rendered. A series of stained glass subjects taken from Ripon and York Minsters well brought out the richness of the glass, none being better than a portion of the window in Ripon taken with the tele-photo lens. Nothing could exceed the brilliancy of the tints of various well-known posters; the correct rendering of landscapes being perhaps the most difficult branch of the subject, was fully explained, and the possibilities of the process in this direction were dilated on, a slide of Marske Mill being almost faultless as an example of this kind of work. The last slide represented a most brilliant sunset in natural colours. The lecture was listened to with the closest attention, and evoked much applause. A cordial vote of thanks, moved by Mr. Addyman, and seconded by Mr. Peach, met with a hearty reception. The Lecturer, in reply, urged upon the members the duty of contributing any new ideas to the common stock of knowledge as the only method by which real progress could be made.

Liverpool Amateur Photographic Association.—"Cities and Sights of Spain."—On Thursday, November 28, Mrs. Le Blond gave a lantern lecture with the above title. The lecture, which comprised the results of three tours in Spain, was most comprehensive, and included views of pre-historic monuments, types of architecture, etc., and was delivered in the lecturer's usual chatty style. The slides, numbering about one hundred, made by the lecturer from her own negatives, were of a very fine order, many of the architectural studies being received with loud applause. Among the series shown were many illustrating the great Roman aqueducts and the various types of building, including Romanesque, Moorish (the Alhambra, etc.), and Gothic, as well as modern styles. There were also a series of views taken in the Armoury at Madrid. Mrs. Le Blond paid a high tribute to the courtesy of the Spaniards, who were ever ready to grant her permission to photograph in places where one would naturally expect to find great difficulty in obtaining entrance with the camera.

FORTHCOMING EXHIBITIONS.

1901.

December 6, 7 ..... Southsea Photographic Society, Pembroke-road, Portsmouth. Hon. Secretary, F. J. Mortimer, 10, Ordnance-row, Portsea, Portsmouth.

Dec. 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

„ 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.

1902.

February 13–15 ..... Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries: W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell Hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.

„ 15–Mar. 8 Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.

„ 19–26 ..... Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.

Patent News.

THE following applications for Patents were made between November 18 and November 23, 1901:—

FLASHLIGHTS.—No. 23,292. "Improvements in the Manufacture or Production of Flashlights for Photography." (Communicated by the Farbenfabriken vormals Friedrich Bayer & Co., Germany.) HENRY EDWARD NEWTON.

SCREENS.—No. 23,295. "Cellular Light Controlling Screen, particularly for Use in Photography." MICHEL ALEXANDRE EDMOND JOSEPH GABRIEL CROMER.

ROLL FILMS.—No. 23,299. "Improvements in Photographic Roll Films." (Communicated by Actien-Gesellschaft für Anilin-Fabrikation, Germany.) CHARLES DENTON ABEL.

PRINTING FRAME.—No. 23,303. "A New or Improved Photographic Printing Frame." Complete specification. J. BOESCH, successor of ROBERT CARLS.

CAMERAS.—No. 23,338. "Improvements in Photographic Cameras." CHARLES HOWELL and GEORGE LLOYD MOORE.

PRINTING FRAMES.—No. 23,368. "Improvements in Photographic Printing Frames." Complete specification. WILLIAM HUDSON.

CHANGING BOXES.—No. 23,431. "Improvements in Changing Boxes for Photographic Cameras." ARTHUR LEWIS ADAMS.

RACKS.—No. 23,453. "Improvements in Racks for Photographic Plates." (Communicated by Otto Berlebach.) ERNEST HACKENBERG.

STANDS.—No. 23,454. "Improvements in Camera Stands." (Communicated by Otto Berlebach.) ERNEST HACKENBERG.

FILMS.—No. 23,551. "Improvements relating to the Manufacture of Photographic Films." SOCIÉTÉ ANONYME DES PRODUITS PHOTOGRAPHIQUES M-Y.

CINEMATOGRAPHS.—No. 23,564. "Improvements in Cinematograph Apparatus." PAUL MORTIER.

PHOTOGRAPHIC ADVERTISING.—No. 23,635. "Photography in relation to Advertising." EDWARD CRABB and WILLIAM RIDER.

DEVELOPING APPARATUS.—No. 23,743. "Improvements in Photographic Developing Apparatus." JAMES WILLIAM SMITH.

LENSES.—No. 23,787. "An Instrument for determining the Foci of Lenses." JOHN ANDERTON.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—The majority, at the last special general meeting of the Royal Photographic Society, lost much of its force owing to the want of concerted action among the units of which it was composed In order to remedy this lack of cohesion and consequent loss of

strength, a few members propose to meet next Monday evening, before the R.P.S. meeting, to formulate the line of action to be followed.

Any of your readers (being members of the Society) who may care to be present can receive particulars as to time and place on sending me a post-card stating that it is their wish to be present. The only condition for admission to the meeting is that the member desires to support the President in his recent action.—I am, yours, &c.,

ERNEST C. FINCHAM, M.R.C.S., Eng; L.R.C.P., Lond.

36, Addison-road, Kensington, W.

To the EDITORS.

GENTLEMEN,—The question of omitting the names of nominators from the list of nominees for election on the Council of the Royal Photographic Society comes before a special general meeting on the 9th inst., and, as I cannot be there to repeat the vote that I gave at the last special meeting, I beg that you will allow me to explain my views on the matter.

It is alleged (1) that the present form of ballot list leads to much canvassing or solicitation of votes, and (2) that any nominee with a large number of nominators is practically certain to be elected, thus insuring to such individuals a long tenure of a seat on the Council. On No. 1 it is unnecessary to dwell, because it is obvious that merely omitting the names of nominators will not of itself reduce canvassing, and may even increase it.

As regards No. 2, it has not yet been proved that the absence of a large number of nominators is necessarily a bar to election. Within the last few years Professor Meldola, Dr. Emerson, Mr. Ferguson, and I, and I think some others, have been elected on the Council when we had very few nominators. Against the view that the names of nominators are a guide to members to whom the nominees are not personally known, it is objected that members ought not to vote for any one whose qualifications they only know of through someone else. At first sight this seems a weighty argument, but it is forgotten that in the majority of elections most of the votes recorded are given to persons known to the voters solely through the recommendations of others. In any case, whatever recommendation may be implied by the publication of a nominator's name, has the merit of being perfectly public and open.

Another point which seems to me to be of great importance is that the publication of nominators' names acts as a check upon frivilous or undesirable nominations, and must lead to some feeling of responsibility on the part of the nominator. In all public elections the names of nominators are made known, and this is required by law in order to protect the electorate from any nominations but those made with a due sense of responsibility. What is valuable in national politics is surely valuable also in the smaller sphere of Society politics. At present all members of the Society know who are responsible for the nomination of each individual. I quite admit that a long string of names is unnecessary, and would like to see the number limited to five, but that is a very different thing from omitting them altogether. It seems to me that if nominators' names are to be omitted, there is no course open that carries with it any safeguards except the adoption of the method of many societies, which, whilst leaving room for independent nominations, yet have a so-called "house list" of nominations prepared by the outgoing Council. There are objections to this plan, but, on the whole, it works well. In most cases, however, it is associated with the compulsory retirement of a small proportion of the Council each year.

I do not deny that improvements might be made in the mode of electing the Council, but I do hold that the change now proposed is one of the least wise that could be adopted, and is far more likely to be harmful than beneficial.—I am, yours, &c.,

C. H. BOTHAMLEY.

Weston-super-Mare, December 2, 1901.

To the EDITORS.

GENTLEMEN,—My thanks are due to you for the appreciative comments appended to my letter in last week's JOURNAL, and for giving publicity to the suggestion, which I gather has originated with several of the members of the R.P.S., that I should accept nomination for a third term of office as President of the Society.

Although pressure has been brought upon me to comply with this request, I feel it my duty to state at the earliest possible moment that it is impossible for me to accede to it. In bringing the suggested reforms before the members of the Society, I have accomplished the end I had in view in my Presidential address on October 8. The meetings that are to be held on Monday evening next will finally dispose of these reforms in so far as I am officially concerned.—I am, yours, &c.,

Woking, December 2, 1901. THOMAS R. DALLMEYER.

HISTORY BY THE CINEMATOGRAPH.

To the EDITORS.

MESSIEURS,—J'ai lu avec intérêt, dans votre numéro du 22 Novembre, l'entrefilet intitulé "History by the Cinematograph." L'on a bien raison d'appeler l'attention sur l'importance future qu'aurait la conservation des bandes cinématographiques documentaires. Je me suis préoccupé déjà de cette question de notre "Musée des Photographies documentaires," où nous avons des bandes cinématographiques.

Le celluloid n'est pas, en effet, une substance susceptible de durée; elle se détériore spontanément avec le temps. Je conviens donc de chercher un moyen de conservation des vues animées que l'on désire voir passer à la postérité.

J'ai pensé qu'en attendant mieux on pourrait transferrer sur papier au "bromure d'argent" le négatif cinématographique et traiter ensuite par la paraffine la bande positive ainsi obtenue. Sauf à en tirer ultérieurement une bande négative par contact (transparente) en rendant le papier translucide. De cette façon l'altération ne serait plus à craindre.

Le mieux serait après paraffinage, recto et verso de la bande de papier, de la rouler avec soin en évitant les cassures et de l'enfermer dans une boîte de fer blanc hermétiquement scellée. On y mettrait une étiquette indiquant la nature du sujet, la date, etc. Il est probable qu'ainsi traitée la bande de papier et l'image y imprimée défieraient l'action du temps.

N'employer que de la paraffine bien pure.

Je n'ai pas la prétention d'indiquer ce qu'il y a de mieux à faire; sans doute d'autres trouveront-ils quelque chose de préferable, mais en attendant je crois mon conseil bon à suivre, sauf à employer ultérieurement toute autre méthode qui semblerait meilleure.

Veuillez agréer, chers messieurs, l'assurance des mes meilleurs sentiments. LEON VIDAL.

"Moniteur de la Photographie," 29 Avenue Henri Martin, Paris.

26 Novembre, 1901.

Je trouve qu'on ne s'occupe pas assez d'encore de collectionner les photographies documentaires et de rechercher les moyens de les conserver pendant des siècles.

CASKET LENSES.

To the EDITORS.

GENTLEMEN,—As a further reply to "Xit," your correspondent will get what he wants, and at the price, from W. Butcher and Sons, Blackheath.—I am, yours, &c.,

THE WRITER OF THE ARTICLE.

November 29, 1901.

GLASGOW SOUTHERN PHOTO EXHIBITION.

To the EDITORS.

GENTLEMEN,—I should be much obliged if you will draw the attention of your readers to the above exhibition, to be held from Dec. 23, 1901, to January 4, 1902. Entries close on Wednesday next, December 11. The classes are open to all, and are as follows:—(1) Landscape and seascape; (2) portraiture and genre studies; (3) lantern slides (in sets of three); (4) stereo work (sets of two); (5) Glasgow Exhibition lantern slide; (6) novice. Silver and bronze awards. The judges are Messrs. Tom McEwan, R.S.W., J. Douglas Ritchie, and William Goodwin. I shall be pleased to forward prospectus containing entry forms and full particulars on receipt of post-card. Thanking you in anticipation,—I am, yours, &c.,

JOHN B. HAGGART, Hon. Secretary.

93, Norfolk-street, S.S., Glasgow, November 30, 1901.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the EDITORS.

GENTLEMEN,—May I make known through the medium of your paper that a meeting will be held at the Queen's Hotel, Folkestone, on Tuesday, December 10, 1901, at 7 p.m., to start a branch of the Professional Photographers' Association for East Kent, when it is hoped that there will be a large attendance, and that the branch will receive the hearty support of all photographers in East Kent. I hope all those who have, either by change of address, or those whose names are not in the directories or other causes, not received the notice of same, will see this and accept it as an invitation to the meeting.—I am, yours, &c., S. LAMBERT WESTON.

23, Sandgate-road, Folkestone, November 27, 1901.

THE LAW OF REGISTRATION.

To the EDITORS.

GENTLEMEN,—In thanking you for your kind assistance in this matter of registering my photograph of views, I cannot help expressing my astonishment with regard to the law of registration as it

stands in making difference for a single subject, or the same subject in a divided form, as in the case in hand. If, for instance, you have a group of political, scientific, or any other grouped individuals, composed of various single negatives, to register such composition effectually, every figure in the picture should be protected. This is something new to me. Mr. McLachlan, for instance, has not protected, I think, every single figure in his picture of the Royal Family. He most likely protected the picture as a whole, but, in the version of the official's note to your inquiry, every person in a composed picture or view, as in this instance, should be registered individually.

I should like to hear other photographers' opinion about it, as it will concern me very much in the immediate future with other works of similar kind.

To have to take the things as they stand at present, I wish to register the photo as one picture only, as the result of sale would perhaps not harmonise with the expense.—I am, yours,

W. N. FISCHER.

19, Egerton-crescent, Withington, November 28, 1901.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. Mills, "Highfield," Bath-road, Walsall. *Photograph of group.*

H. Lowthian, 144, Freeman-street, Grimsby. *Photograph of the Mayor of Grimsby.*

Lord & Caisley, 15, Dalton-street, Todmorden. *Two photographs of the Todmorden flood.*

W. H. Fischer, 19, Egerton-crescent, Withington, Manchester. *Photograph containing thirty views.*

SOLPHINE.—You had better read the whole of the leaderette you refer to. You will see we do not recommend the use of the liquefied gas, and we stated that one shilling per pound did not pay. But even at your own quotation of fourteenpence is equivalent to under fivepence for the usual solution. You appear to buy on exceptional terms, for Howard's price is sixteenpence, and the wholesale druggists' lists give 4½d. and 4d.

LANTERN SLIDES OF SEAWEEDS.—G. G. asks: "Where can lantern slides (other than microscopic ones, and those in the 'Half Hours at the Seaside' set) of British seaweeds be borrowed, hired, or purchased?"—In reply: The most likely place to obtain what you require will be Newton and Co.'s, Fleet-street, E.C. They make a speciality of slides of that character.

CLASSES FOR PHOTOGRAPHY.—B. A. M. writes: "I will be obliged if you will say if you consider the Polytechnic, Regent-street, a good place to attend classes in order to become a proficient artist in black and white, etc.? Or do you know of any school where lessons could be had?"—In reply: The Polytechnic School classes are very good, and you cannot do better than join them. Or you might take private lessons from some artist who is proficient in that kind of work.

W. SMITH.—In the extract of the agreement sent there seems to be no mention of the copyrights; but, as you doubtless have the negatives, the executors will probably assign the copyrights to you on your paying the balance due. But you will, no doubt, have to pay the costs of the assignment of them. Are you a member of the Photographic Copyright Union? If so, we should advise you to communicate with its Secretary. He may know a decision on the point.

VIEWS FOR PUBLICATION, &C.—"CLAUD" writes: "I am anxious to fit get up some views for publication. Please say where I could obtain the celluloid, also the brass frame? Would it be safe to copy this style of mounting pictures?"—In reply: Messrs. Marion and Co., Soho-square, will probably supply the frames and celluloid; or the Artistic Photographic Company, Kentish Town, would no doubt do so. You will be perfectly safe in copying the style of mounting the pictures.

FORMULA WANTED.—E. SMITH writes: "Would you kindly give me a good formula for a combined toning and fixing bath for gelatino chloride prints? I think there is a good one in the ALMANAC, but as I have mislaid mine, I trust you will oblige me."—In reply: There are many formulæ for combined toning and fixing baths. The makers of gelatine printing out papers give the one they think best for their particular papers. We should advise you to use the one given in the instructions issued with the brand of paper you employ, as that is no doubt best suited to it.

BOOKS WANTED.—"JIMMY" writes: "May I trouble you to give me the names, and where obtainable, of the best books on photographic printing processes, both new and old styles? Books giving full working instructions, and also ways of fancy printing, etc.?"—In reply: Burton's book of printing processes will give you a general insight in the various printing methods. It is a practical work, but does not go into the ways of "fancy printing," a term we do not quite understand. If by that you mean double, or multiple, printing, we know of no book devoted to that subject, but upon it will be found many articles in back volumes of the JOURNAL.

WAGES AND EMPLOYMENT ABROAD.—H. CULLAM writes: "Purposing going to the United States, can you give me any idea as to wages and chances of employment a man has out there? And have you any further particulars you can give me re same in United States, Canada, or West Indies? Any information will be acceptable."—In reply: Unless you are an exceptionally high-class operator we do not think you will stand any better chance in the places mentioned than at home. In all of them the photographic labour market is fully stocked, if not over-stocked as here. Salaries in the States are, we believe, somewhat higher than here, but, then, the cost of living is correspondingly higher.

STUDIO APPARATUS.—S. W. writes: "(1) I should be glad if you could instruct me as to the necessary cameras and lenses for general studio work? (2) Ditto for outdoor work."—In reply: These queries are difficult to answer, inasmuch as we do not know the scale you wish to work upon, or the length of your purse. For studio work, a studio camera and stand will be required, and a lens of the portrait type for small pictures will be the best, say, one of about twelve inches focus for pictures up to cabinet size, and a lens of the "group" type for the larger sizes. For outdoor work, a landscape camera of the portable form, with a lens of the anastigmatic or R.R. type, will be best. See makers' catalogues.

THE SPEED OF LENSES.—"PRO BONO PUBLICO" writes: "The theory of a lens is that at f-8 the speed of every lens is equal. I work with a 3B Optimus, stopped at f-8, 13 in. focus, but for a 12×10 I use a R.R., f-8, 16 in. focus, and to get the same size of image with my 12×10 as my Optimus I have to give double the exposure when taking a 12×10 with my R.R., using Ilford special rapid plates in both instances. The aperture of my 12×10 lens at f-8 is 2 inches, and the aperture of my Optimus at f-8 is 1½ inches. Can you give me an explanation why this is so?"—In reply: If the effective apertures are the same, whether f-8 or any other be used, the exposures will be practically the same—that is supposing the glasses composing the lenses are equally colourless. Theoretically, the portrait combination, by reason of its two extra reflecting surfaces, will be slightly slower, but that is a negligible quantity.

VARIOUS QUERIES.—J. T. BROWN writes: "(1) In using Watkins' method of timing development, is it necessary that the plate should be correctly exposed? (2) Have there been any articles on this system in your JOURNAL, and if so, what dates? (3) Have you had any articles in your JOURNAL or LANTERN RECORD on enlarging by using one's camera and lens in conjunction with an ordinary magic-lantern? (4) Is there any book in which I can get full instructions for double or combination printing?"—In reply: (1) Yes, in order to get the best results. (2) Yes, the subject was fully dealt with in the ALMANAC for the current year. (3) There have been articles on the subject in the JOURNAL from time to time. But there is no necessity to use the camera at all if the enlarging lantern be used in a darkened room—the most general method of working. (4) No; but there have been many articles in the JOURNAL on the subject. One appeared only last week.

ORTHOCHROMATIC PHOTOGRAPHY, &C.—A. G. B. writes: "(1) Mr. Ives's experiments (BRITISH JOURNAL ALMANAC, 1896) tend to prove that, 'with suitable compound colour screens much truer colour values can be obtained on ordinary plates than yellow glasses will give on commercial iso or orthochromatic plates,' the only drawback, seemingly, being that a longer exposure is required. Would you kindly inform me if subsequent experience confirms this? If such screens can be obtained commercially, and where? If the dye is fairly permanent, or must it be used fresh? If not obtainable on the market, or if they deteriorate by keeping, where are the dyes to be procured in small quantities? Would the same effects be secured by coating flat plate glass with the dye, using pellucid celluloid varnish as a vehicle, without sealing between another glass? I take it that the dye would not be subjected to deterioration if dissolved in the vehicle kept in a closed bottle and away from light? (2) I see that for some focal plane shutters it is claimed that, with a uniform tension of spring exposures varying from $\frac{1}{10}$ to $\frac{1}{1000}$ second can be obtained simply by varying the width of the slit. How is this explained, seeing that, taking the maximum width as 5 in. and the minimum as $\frac{1}{8}$ in., the ratio is only 1 in 40?"—In reply: (1) Since Mr. Ives's article was written improvements have been made in commercial orthochromatic plates. Write to Messrs. Cadett and Neall, and to Messrs. Sanger Shepherd, for their pamphlets on the subject. They will enlighten you much. (2) You overlook the fact that with the wider slit the light is acting over a larger area of the plate than it is with the narrow one.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

The Forty-first Annual issue of The British Journal Photographic Almanac is now published. The total number of pages in the Almanac for 1902 is 1580, and the volume is the largest yet produced. The text portion of the book occupies about 600 pages. It will, as hitherto, be issued in paper covers, price 1s., or cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Wellington and Ward, of Elstree, from a negative by Mr. W. Gill, of Colchester. The Editorial Article is entitled "Introductory Notes on Tele-photography." Over fifty articles on practical subjects, contributed by well-known photographers, form a feature of the volume. The principal advances of the year are synopsised in the "Epitome of Progress During 1901," and in the other sections, "Patented Inventions of the Year," "Miscellaneous Information," and "Practical Notes and Suggestions of the Year," there will be found much useful matter, which, with the large collection of formulæ, tables, and other data for photographers, places at their disposal for daily reference a mass of information not to be found in any other photographic annual.

*** The 1898, 1899, and 1900 editions of the Almanac (20,500 copies each) were sold out within a few months of publication.

*** The 1901 edition was disposed of in less than a fortnight.

*** The entire 1902 edition has already been sold right out, and no further orders can be executed.

EX CATHEDRÂ.

The R.P.S. Meetings. A hundred and four members attended the special general meetings of the Royal Photographic Society on Tuesday evening last. The alterations in the Articles which were passed by the meeting a month ago were confirmed. They are printed in last week's Journal, and are merely matters of administrative convenience which do not call for particular reference. This business was out of hand in a few minutes. The principal matter debated was brought before the second of the two meetings convened, and it was the question whether the names of nominators should, or should not, in future be attached on the ballot paper to the names of candidates for election to the Council of the Society. The debate resulted as follows: For the retention of nominators' names, 7; against, 97. The figures, of course, show a considerably larger majority than the necessary three-fourths. At the conclusion of the business the President announced that the Council of the Society had under consideration the desirability of adopting some method whereby country members can record their votes at meetings of a special nature. Finally, a formal requisition was handed in asking the Council to provide further opportunity for discussing the proposed reforms not yet passed—the appointment of a paid Secretary being the principal change advocated. This simple record, in outline, of Tuesday evening's proceedings would be incomplete without mention of the fact that the meeting passed off quite in

accordance with the best traditions of the Society, viz., in a businesslike and dignified manner. The net, or at any rate the immediate, result of Tuesday's work will be that the ballot papers for the election of Council, which takes place next February, will not bear the names of those nominating the candidates.

* * *

The Kodak Film Case. The action brought against the Kodak Company by Mr. Rhys Williams, and the result of which is reported in our later pages this week, is of some importance to manufacturers, retailers, and users of sensitive photographic preparations. The plaintiff took some rollable celluloid film with him to Uganda, and obtained negatives which could hardly be described as successful. Thereupon he sued the Kodak Company for damages the bone of contention being that the films were bad when they were retailed—in other words, that the deleterious markings which made impossible the production of good negatives and prints were due to faults in manufacture. A study of the evidence shows that the plaintiff failed to prove this, and so the Lord Chief Justice gave the case against him. It will be noticed Lord Alverstone evaded the question of liability. The loss of the case by the Kodak Company would have created an awkward precedent, which photographic manufacturers would find some difficulty in breaking down in cases of disputes with users of plates, papers, films, etc. The action was one which, we think, the plaintiff acted unwisely in bringing, a fatal flaw in the chain of circumstances being, in our opinion, the fact that he did not practically test a few of the films before he left this country. This point was not touched upon in the case. In regard to the main question of the keeping properties of celluloid films abroad—or at home—the evidence disclosed nothing absolutely new, although Sir William Abney's objection to the storage of the rolls in tins deserves, on theoretical grounds, great respect. A full report of the case is published by our contemporary, "The Times," in its weekly law digest, and those interested in the matter should procure that publication.

* * *

The Photographer and Military Service. The length of time we have enjoyed freedom from conscription makes it difficult for the average Briton to realise the privilege he enjoys by the absence of compulsory military service in this country. An article in the "Allgemeine Photographen Zeitung" forcibly brings this fact before us. The ordinary period of active military service in Germany is two years, without counting the time the individual belongs to the reserve; but if the recruit can satisfy the authorities that his education is not below a given standard, he may serve as a volunteer for one year upon payment of all expenses of board, equipment, etc. A law also exists by which any young man, who has shown exceptional ability in any branch of art or handicraft, may likewise claim this privilege, upon satisfying the authorities of his ability and the soundness of his elementary education. It has been held that the law also applies to photographers. But when we compare this state of things with that to which we are accustomed in this country, we think photographers must feel it is no small advantage that accident of birth has placed them on this side of the Channel, notwithstanding the dreary length of the South African war and a fourteen-penny income-tax. Apart from the compulsory blessing of a protective tariff, every physically fit photographer in Germany has to spend two years of his life with the colours at the cost of the State, or at least one year if he is prepared to pay all his expenses. When we add up the total of the taxes and duties taken from us by the State for the expenses of government, the equivalent of this tribute should not be omitted. The German photographer is, however, at least to be congratulated that the State has recognised his claim to privilege under the law relating to voluntary service.

* * *

The Daniel Osiris Prize. The Academy of Science, Paris, has decided that in the year 1903 the first award of the Daniel Osiris prize shall be made. This is of the value of £4000, and, according to the founder, is to be given once in three years for the most important discovery in the domain of the exact or higher sciences, art, or industry. We have heard much of photography in natural colours during the past few years, and this prize should surely stimulate the Chassagnes and Benettos.

* * *

The Action of Sulphite in Development. An interesting article upon the action of sulphite of soda, by Dr. Lüppo-Cramer, is to be found in Dr. Eder's "Jahrbuch." In making experiments with adurol, Dr. Luppo-Cramer found that in using the minimum quantity of sulphite development was impaired. The strong relief of the negative suggested that tanning of the film might be the cause. A comparison with plates developed with the full quantity of sulphite confirmed this, as it was found that the films were much softer. If an emulsion of silver bromide be formed by adding 3 grammes of silver nitrate to 20 grammes of gelatine dissolved in 300 c. c. of water and 2.3 grammes of potassium bromide, it will be found that the addition of a solution of 1 gramme of adurol in 100 c. c. of water and 4.5 c. c. of ammonia will not only reduce the silver bromide, but render the gelatine quite insoluble in boiling water. If a similar experiment be made with addition of 10 grammes of sulphite to the developer, the solubility of the gelatine will remain unaffected, even after the jelly has been kept twenty-four hours. The loss of developing power is, of course, traceable to the impermeability of the coagulated film. Experiments with collodio-bromide plates, instead of gelatine, will show that adurol, without sulphite, develops more quickly. From this the conclusion may be drawn that it is not safe to depend merely upon the process of a chemical reaction in drawing conclusions as to the efficiency of any developer. The nature of the vehicle containing the sensitive salt must also be considered.

* * *

Testing Chloride of Gold. We have not heard much lately of chloride of gold at fourteenpence per fifteen-grain tube, but that it is still an article of commerce we are assured. The busy photographer, perhaps, has not time to test for himself the actual value of any sample of this expensive chemical that he may possess, and indeed if he purchase any well-known brand, and take the precaution to see that it has a guarantee label that a fifteen-grain

tube contains seven grains of metallic gold he will be perfectly safe; but, in view of the existence of the "cheap" sort, which has no guarantee, he should be particular on this point. Lest we may be thought to take too hard a view about these cheap tubes, let us repeat what we have on former occasions pointed out, that as seven grains of metallic gold at bullion price is worth nearly fifteenpence, tubes at the price we name must cost more for the metal alone than that sum, not to speak of the cost of making, of the glass tubes, and of putting it up. Taking gold chloride by the ounce we do not think any manufacturer of repute sells it for less than twenty per cent. above the value of the contained metal. Some photographers, to save this profit, content themselves with simply dissolving gold coins, and ignoring the copper of the alloy, and, having seen results of photographs toned with this solution, we do not see any reason why the plan should not be commonly adopted. As, notwithstanding all this, there may be some who would like to test for themselves the value of any particular tube, we may give Messrs. Johnson and Sons' plan, as given in the pages of the "Journal" of the Society of Chemical Industries. Fifteen grains of the sample are dissolved in an ounce of water, the gold is precipitated by sulphurous acid, collected in a filter, ignited, and weighed. Sulphate of iron might be used, but there would be possible danger of contaminating the precipitate with iron, and so giving an erroneous reading. Sulphurous acid solution can be purchased at almost any chemist's.

* * *

Peculiar Property of Radium Radiations. According to the researches of Messrs. Curie and Debierne, radio-activity can be communicated to distilled water (1) by distillation of a solution of radium chloride that has been allowed to stand for several days, (2) by placing a solution of radium salt and distilled water in two separate dishes in a perfectly closed space, (3) by immersing in distilled water a celluloid capsule containing a solution of a radium salt. Such water may exhibit greater radio-activity than the substance from which it was prepared, but loses its power rapidly in an open vessel, and in the space of a few days if the vessel is closed. A solution of a radium salt also soon loses its activity if kept in the open air, but regains it if transferred to a sealed tube.

* * *

A New Form of Spectroscope. Under the title of "Multiple Transmission Fixed-arm Spectroscope," Professor W. Cassie read a paper, at the last meeting of the Physical Society, on a new instrument he had devised, and which seems to promise to become of great importance. Our readers will be familiar with the usual prism telescope consisting of a single prism, or a number in train, with telescope and collimator, which becomes very costly if several prisms are employed, and it can readily be imagined that if two smaller prisms take the place of, say, six or eight, a very material reduction in the cost would take place. Professor Cassie, at the meeting, exhibited one form, the simplest consisting of two half-prisms silvered on the back, between which a beam of light goes backwards and forwards with a slight upward tendency. The result in dispersing and resolving power is equivalent to a long train of prisms. The collimator and telescope are fixed and adjustment is made by a double tangent screw, which moves both prisms. Two other forms were described, but not shown, one containing a single prism and two speculum mirrors, the other two refracting prisms and a right-angled reflecting prism. There was some discussion as to variations upon the spectroscopes shown and described, and Mr. Cassie, in the course of it, stated that although the loss of light by reflection limited the transmissions that could be used, yet that he believed no other spectroscope with only two prisms would give dispersing power and resolving power in any way approaching the form he exhibited. In gauging the value of a spectroscope for obtaining photographic results, it must be remembered that to a certain extent the effects are incomplete owing to the fact that the glass absorbs so much of the particular portion of the spectrum most powerful photographically. Yet this objection is less important than it would appear when it is called to mind that in all, or most, photographic work the light utilised must pass through the glass of the lens which itself takes up a certain amount of these rays.

* * *

Foreign Copyrights. The matter of foreign copyright does not appear to be fully understood by many in this country, or we should not have so frequently to reply to correspondents who ask if they "run any risk" in copying some of the reproductions of paintings so largely published on the Continent. They do not seem to recognise the fact that any work that is copyright in any country that is a signatory to the Berne Convention is also copyright here, and that no formalities, such as registration, are necessary in this country. America, however, is not a signatory to that Convention, and, therefore, any works published there, or on the Continent, can be, and are, pirated in the States without let or hindrance. But the piracies must not be sold here. A case, or rather two cases, were tried in the King's Bench Division of the High Court of Justice one day last week (see page 776). It was an action by Franz Hanfstaengl, of Munich, for an injunction and damages to restrain the British Mutoscope and Biograph Co., Ltd., and the London District Mutoscope Co., Ltd., from publishing, importing, or exposing for sale, or otherwise distributing any copies or colourable imitations of some of the plaintiff's copyright works. The plaintiff also claimed penalties as well as damages under the Copyright Act of 25th and 26th Victoria. It appears that three of the plaintiff's copyright works—"Marguerite," by Hengler, "Virgin and Child," Bodenhausen, and "A Song Without Words," by Poltzelberger—were reproduced from his reproductions by a firm in Philadelphia, and were imported into this country, and shown and sold by the defendants. As the International Copyright Act does not apply in America, these piracies may be sold there without let or hindrance; the Act, however, prevents them being sold in this country, and also makes it illegal to import them. The Act also provides that they may be stopped at the Custom House. The defendants, as soon as their attention was called by the plaintiff's solicitor's letter, offered to submit to an injunction, and to give an undertaking not to deal with the photographs objected to, and to deliver up infringements, but the plaintiff refused to accept that offer, hence the case came on for trial. The action for penalties failed, and the jury, in finding a verdict for the plaintiff, assessed the damages at £3, and judgment was given for that amount in each case, and

injunctions. An order was also made for the delivery up of the sixty-four copies in Court. It appears that only seventy-two of these photographs were imported, and some were bought for the purposes of the action. That may possibly account for the small amount of damages awarded by the jury. We have frequently heard complaints by English photographers of their works being freely reproduced in the United States, and, of course, there is no law to prevent it; yet we know that some of the higher-class illustrateds—the better class of magazines—in America remit a fee for photographs of celebrities and other subjects that they reproduce, although they are under no legal obligation whatever to do so. It is merely a voluntary act on their part. We also hear that the fee they send is sometimes larger than some of the illustrated papers pay here, unless they are compelled to do so. It may be mentioned, in connection with the International Copyright Act, that, while here registration is necessary to secure the copyright, in Germany it is not necessary. The mere publication there secures the copyright throughout the Union, inasmuch as the laws of that country are complied with, and that same condition holds good in all the countries that were signatories to the Berne Convention. What is a legal copyright in one country is a legal copyright in all.

THE POSSIBILITIES OF COLOUR PHOTOGRAPHY.

The dream of reproducing all the varied and wonderful coloration of nature by means of photography, remarkable indeed as recent progress has been, is perhaps as far from realisation as ever. With the single exception of the Lippmann process, hedged about with technical restrictions, and, in its result, necessitating an abnormal method of viewing, none of the many systems of colour reproduction can be called in any sense direct. We can all admire without stint the exquisite effects obtained by the ingenious and beautiful method due to Ives, or the more mechanical and less complicated devices of Joly and Sanger Shepherd, but, however practically useful and satisfactory for their purpose they may be, they still, alas, fall short of the longed-for ideal, which shall make every photographer his own painter, no longer in monochrome, but in the glorious tints and harmonies of reality. It must be admitted that, compared with the striking development of photography in general, since its first beginnings, rather more progress might have been expected in this direction. Curiously enough, people were more sanguine of a successful solution of the problem of colour photography even thirty or forty years ago than the majority are now. It would be superfluous to quote those early prophets of the coming triumph of photochromy. Charles Kingsley's well-known apostrophe in "Two Years Ago" is only one among many. But progress in this direction seems rather to have damped the ardour of experimentalists than otherwise. The subject has been seen to be more complicated than was at first imagined, and a better comprehension of the mysterious laws governing colour sensation and vision has led to a greater degree of respect and hesitation among those who approach the matter. Then, too, it is really remarkable how comparatively little interest is taken by the majority of photographers in what should be to them a most fascinating quest. It is not difficult to imagine how different would have been the attitude of the early pioneers of photography—keen experimentalists and lovers of their art as they were—if they had but known as much as we now do of the theories and latent possibilities of photography in colours. Nowadays, we are too fond of taking a "thus far and no farther" for granted, and resting on our oars contentedly, basking in the light of other men's experience and failures, and refusing to be drawn into what we regard as a doubtful and unremunerative pursuit, foredoomed to lack success.

Why, it is often asked, should experiments in this direction be confined to the few, clever of intellect and perfect in technique though they be? Is it not a saddening reflection that the successful British workers in, for instance, the Lippmann process may be counted on the fingers of one hand? Why cannot our multitudinous photographic societies take advantage of such a splendid field for independent original experiment and research as the whole subject undoubtedly affords? Some time ago an experimental class was suggested and formed at a well-known London Polytechnic for the purpose of encouraging photographic investigation and study in new directions. As a result, it may be remembered by some, several decidedly interesting and helpful facts were elucidated. If so much resulted from the gathering together of one small band of workers for one brief session, it is easy to imagine how vast might be the benefit if societies in general were impregnated with the experimental spirit, and set out to discover and prove things for themselves rather than pursue an acknowledged and beaten track. The scope for inquiry and experiment is truly remarkable. Let us endeavour, at the outset, to obtain a clear and definite idea of what we really desire to attain in order that photography in natural colours may no longer be a dream of the future, but a practical and practicable actuality. We require, then, a process or means by which a positive picture in the true colours of nature may be obtained with one exposure on one plate or other receiving surface; the exposure to be as rapid as that possible with ordinary plates. Or, a means by which a negative in complementary colours can be secured, and a paper or other surface capable of reproducing from this negative, by means of direct printing, any number of prints in natural colours.

So much for the requirements of the ideal, and non-existent, process; it remains to be seen how far the systems we now have in use satisfy these desires, and in what directions they are, or may be, capable of improvement. Firstly, let us consider the Ives process. This highly beautiful and elaborate product of the perfection of scientific thinking and unbounded patience depends essentially on the taking of three negatives answering to the three fundamental colour sensations. It therefore, unfortunately, however practically successful and useful, fails to make any contribution to the solution of our problem. It, however, certainly affords us a brilliant illustration of the success with which three distinct images can be synchronised, with perfect and accurate registration, a point of much value, as we recognised on many previous occasions. Next we will turn our attention to the much-discussed Joly process, with its finely-ruled taking screens. When all is said and done, there is perhaps no avoiding the conclusion that the lines, however fine and minute, are distinctly distracting and objectionable. Well, here is room for the experimentalist. Let some one devise a screen composed of extremely small dots instead of

lines, so microscopic as to draw no more attention than the grain of a plate now sometimes does. That being done, and it is quite within the range of possibilities, we should be a long step nearer our goal, as a very little thinking will show. There still remains the necessity for the viewing screen, however, and, in so far, the process cannot be described as a really direct method of photochromy. And it is difficult, with our present knowledge, to foresee any means by which this objection may be overcome. The Sanger Shepherd process labours under the same disadvantage of not being a truly direct method of translating colour, although both theoretically and practically it possesses many merits. It does not, however, contribute in any way to the solution of our problem, nor give us any helpful suggestion that may act as a finger-post on the road.

All things considered, the Lippmann process is, as we said before, the nearest approach to a realisation of our ideal, and is well worthy of the most attentive and minute study. It is perhaps on the lines of this system, and as a natural development from its fairly well understood principles, that the future conquest of our present difficulties may be looked for. There is abundant scope for the independent investigator who is willing to expend time and patience on this process, and perhaps the satisfaction of effecting some great and striking improvement. After all, how much lies buried in mystery that may be brought to light in the future! What secrets may be lurking in that eccentric compound of so-called red silver chloride that has worried the brains of many a bygone scientist! Was Carey Lea nearer to the goal than he dreamed? Who shall say? Becquerel, too, and Charles Cros; has their work received quite the amount of attention it deserved? We want to clear our minds of prepossessions and prejudices, and pet scientific theories, and give rein to a little sheer empiricism for awhile; patient investigation and experiment, whether we see our way clear or not, are the golden qualities that may bring a rich reward.

FACTORIAL DEVELOPMENT.

[A Paper read before the Oxford Camera Club.]

It was in 1894 that Mr. Watkins first brought out his system of factorial development, and it is worthy of note that previous to that date he had regularly practised tentative development with pyro-ammonia. I do not propose to go over again all the history of the subject, or to describe in detail the numerous experiments which induced Mr. Watkins to formulate his law as to factorial development. The experiments have now been before the public for over seven years, and I have not yet heard of any scientific observer who has brought forward any facts sufficient to throw doubt on the accuracy of either the experiments or the deductions made therefrom. On the other hand, other experimental work has been done that has corroborated that of Mr. Watkins in a remarkable degree. The deductions Mr. Watkins arrived at may be briefly stated as follows: That all developing agents will give equal density if allowed to act for a sufficient time; that bromide holds back the lower tones temporarily, but as shown by Messrs. Hurter and Driffield it must be added before development is begun, and even then with lengthy development the tones come back to the original ratio; a difference in the quantity of alkali only alters the speed of development and not the gradations. Other things being equal, the longer a plate is developed the greater the contrasts, and vice versâ. Finally Mr. Watkins deduced the important law, "That any change of temperature (within limits) or of amount of alkali (or of strength of developer with most developers) which lessened or increased the time required for a certain amount of contrast (or density) also altered the time of appearance of the image in exactly the same ratio.' Or, in other words, that using the same developer the ratio between the time of the first appearance of the image and the total time of development was always the same for the same density. To make this plain let us take an example. Suppose we expose two plates on the same subject for the same length of time. We take one and pour on it a developer at 65° F., and after it has been covered for one minute we note the first sign of an image; then supposing the factor of the developer is six, we leave it in the solution for six minutes. Now take the other plate and develop it with the same developer at a temperature of 45° F. In this case nothing will probably be seen of the image for two minutes, but again multiply by six and leave in for twelve minutes. It will then be found that the two negatives are identical, though one was developed for a total time of six minutes and the other for twelve.

Now it is a curious fact that with all the developers on the market except pyro and amidol, the amount of the developing agent present in the developer makes no difference to the developing factor, but with pyro a great difference results within certain limits, so that with this developer the same factor can be always used, and the density varied by diluting the developer. Developers generally may be divided into two classes: (1) Those that give detail readily and density only after a long period, such as metol, rodinal, and weak pyro. (2) Those that give detail slowly but density very quickly, such as hydroquinone, strong pyro, and adurol. The first class have large factors, and the second very small factors. An intermediate developer is probably the best for ordinary work, while the mixing of a developer of each class has advantages, the combined developer having a factor in proportion to the amounts of the different developing agents used. I would, however, at this point like to warn workers that Watkins' factor law does not appear to be correct for some of the mixed developers, that is to say that a difference in temperature will alter the scale of gradation. In a photographic journal a short while ago a writer signing himself F. C. L. gave the result of a series of experiments relating to the effect of temperature on the action of different developing agents. He found that a drop of 20° F. from a summer temperature had a very different effect on different agents.

In Pyro the image was twice as long appearing.
Ortol the image was five times as long appearing.
Quinol the image was four times as long appearing.
Metol-quinol the image was three times as long appearing.

In the first three the gradation of the negative was practically the same in hot and cold when the same factor was used, thus corroborating Mr. Watkins' experiments; but in metol-quinol the gradation was much less steep in the cold than the warm. This however, is only natural if we consider for a moment that quinol, the density-giving agent in this combination, works four times as long with a drop of 20°, while the period previous to the first appearance of the image is only three times as long in the combined developer. It is obvious, therefore, that to use the factor method with this developer it is necessary to always develop at approximately the same temperature. The factors of some of the most-used developers are given by Mr. Watkins as follows:—

Pyro-soda.	1 grain pyro ¼ grain bromide	9
" "	2 grains pyro ½ grain bromide	5
" "	3 grains pyro ¾ grain bromide	4½
" "	4 grains pyro 1 grain bromide	4
" "	8 grains pyro 2 grains bromide	3¼
" "	Ilford Maximum pyro	4½
" "	Ilford Minimum pyro	5½
Hydroquinone		5
Metol		28
Rodinal		40
Ortol		10

It would be well if, before adapting this method, photographers would try and comprehend what it all means, and not use the law in a blind way, expecting it to automatically turn out a perfect negative from every exposure. Of course, if everything had the same range

of tones, then with the help of an actinometer it might be possible to produce good negatives with automatic precision; but, fortunately or unfortunately, subjects vary very much in that respect, and in the cases of very long range or very short, the results have to be to a certain extent falsified to obtain satisfactory and pictorial results. For instance, in a dark interior with clear glass windows the exposure should be very full, and the factor used should be smaller than that generally adopted. Again, in a distant landscape where the range of tones is very short, a brief exposure and a longer factor will produce the best results. What should be borne in mind is that length of development regulates contrast, and that the factorial system enables the worker to regulate length of development. Each man should find out by two or three experiments what factor best suits his developer and his favourite printing process in average work, and then raise the factor or lower it according to whether he requires his finished print to have harder or softer contrasts than the original subject. A great point about the system is that slight errors in exposure have practically no effect on the resulting print; all that happens is that the negative takes a long or short time to print, according to whether the exposure is too long or too short. I have two sets of prints taken from twelve negatives. The first six are of an interior subject, and under identical conditions were exposed for 3, 6, 9, 12, 15, and 30 seconds respectively. The other six were exposed on an exterior subject, again under identical conditions, for 2, 4, 8, 16, 32, and 64 seconds. The differences in the results are very slight and in five of the prints of the outdoor subject practically negligible, notwithstanding that the original negatives were on special rapid plates (Imperial), and that in the first series the proper exposure was about 30 seconds and in the second series about 4 seconds. It is worthy of note that the difference in the exposures altered materially the time at first appearance of the image. In the interior six the image appeared in 120, 120, 115, 110, 100, and 90 seconds; in the exterior six it appeared in 100, 90, 75, 70, 65, and 55 seconds. It is evident, therefore, that the time of first appearance of the image depends on the length of exposure as well as the composition of the developer, the temperature, and the intensity of the light at the time of exposure. Developers that can be used over and over again are of doubtful value under this method after repeated use, as increase of bromide obtained from the plates during development may gradually alter the contrasts, especially with those that give density quickly. The best method is to use a pyro-soda developer so constituted that it will give good results with a factor of 6. This is what Mr. Watkins styles his sextuple method, and it has two great advantages. In the first place it does away with any mental arithmetic, for the number of seconds that elapse before the image appears only have to be divided by ten to give the minutes that total development will last. For instance, if the image appears in 40 seconds, total development will occupy 4 minutes; if it appears in 55 seconds, the total time will be 5·5 minutes, or 5½ minutes. The second advantage is that pyro being the developing agent, the contrast of the negatives can be altered by the amount of the dilution of the developer, without changing the factor.

In my own work, however, I must own that I prefer altering my factor to changing the strength of the developer, but that is purely a matter of personal convenience. I can say most truly that ever since I have adopted factorial development, some two years ago, I have obtained from my exposures a far higher percentage of good printable negatives than I ever got before.

I sincerely hope that any members who have not yet done so will give the factorial method a trial, using the factor law in an intelligent way with a view to getting the results they require, and not as a sort of automatic machine, which has only got to be set in motion to produce a perfect negative every time. The process is one that is specially useful to the amateur. Pyro can be used without any fear of getting the fingers stained, for the plate need never be removed from the dish till development is complete. There is no need to look through the plate, therefore it does not matter if the strength of the dark-room light is not always the same. But one of the great advantages of all is that, even if no developing has been done for a considerable period, good negatives can be got immediately on resuming work, and there is no fear of spoiling half a dozen plates before one has got back the knack of judging density. Before concluding I should like to impress on you one important point, and that is that the time of first appearance should be estimated from the first sign of that part of the negative that the photographer wishes to appear as practically white paper in the final print.

CLAUDE RIPPON, M.A.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

XIII.—OTTO WIENER, 1899 (*continued*).

MESLIN[1] took this latter point of view, since he believed that he need not consider the intensity (calculated by the formula) $J=(N-1)^2(N+1)^2$ for (0·08) of the light reflected at the layer into air with perpendicular incidence. Although, according to Meslin,[2] from $N=1·5$, J would only be 0·04, this wave of light may not, nevertheless, be left out of consideration; for it necessarily interferes with the waves reflected at the elementary mirrors, and the intensity is not decisive, but the amplitude, with the amount

$$\sqrt{0·04}=0·2.$$

Even in the most favourable case, that the amplitude of the total wave of the light reflected from the bottom of the layer nearly attains the value 1, the maximum and minimum of their interference with the surface-wave would stand approximately in the amplitude-ratio,

$$(1+0·2)\,/\,(1-0·2)=3/2,$$

thus approximately in the intensity-ratio 9/4. In reality this relation will be still greater, and must not be left out of consideration. For this Wiener's communication contains also a series of experimental proofs.

The surface-wave would not be disturbed only if it had the same phase for the active colour as the elementary waves. For example, this would be the case (Wiener speaks only of the electric force of the waves) if one might suppose that a node of the stationary waves lay during the illumination in the surface of the layer, and that the phase-variation by reflection at an elementary mirror arising from development were equal to zero. Both suppositions have in fact been made,[3] and both are incorrect.

Thus, there is in general no coincidence in the phase of the surface- and bottom-wave for the active colour, and in consequence the correctness of the colour reproduction is disturbed.

One is easily convinced of this disturbing influence of the surface reflection by simply suppressing it.

If, for example, the plate is plunged into benzole, whose index of refraction lies near that of the layer, then the correct colours appear, in so far as no further errors are present.

In what follows Wiener showed on what circumstances the difference of phase between the surface-wave and the elementary waves depends, and how, separately, the faults conditioned thereby can be removed.

The first section of the memoir is entitled, "Distance of the first *Bauchebene* from the gelatine-mercury surface."[4] It was often asserted that Wiener had showed that a node of the stationary waves lies in the plane of reflection, also under the conditions of Lippmann's method. His experiment,[5] indeed, only referred to reflection at glass, not at a metal. But the phase-variation at such has not, like a transparent, optically denser medium, the amount of 0·5 wave-lengths, but as results from theory and experiment,[6] another amount. *What* amount, it is indeed possible to calculate theoretically; however, there would be no certainty whether the calculated value really held under the conditions of the experiment. Researches on the absolute phase-variation on reflection at

1 "Ann. de Chim. et de Phys." (6), 1892, xxvii., p. 374.
2 Ibid. p. 370.
3 Cf., e.g., Labatut, "Compt. Rend.," cxiii., 1891, 126.
4 Wiener, loc. cit., pp. 490, 491.
5 Wiener, "Wied Ann." xl., 1890, 229.
6 Wernicke, "Pogg. Ann." clix., 1876, 198.

metals have shown that this magnitude is under circumstances extraordinarily sensitive to traces of impurity of the boundary surface.[7]

Thus it was requisite to determine directly by experiment the phase-variation of light by reflection in gelatine at mercury. H. Wallbott[8] did this for Wiener and found the phase-variation by reflection in pure gelatine, dried under the desiccator, at pure mercury for colours of wave-lengths $\lambda=625\mu\mu$ to $475\mu\mu$ to be equal to an acceleration ϕ of respectively 0·405 to 0·411 wave-lengths, under uniform rise of values up to this amount. The partly "extra-polished" theoretical values fall off in the same limits from 0·414 wave-lengths to 0·404.

If the gelatine was not dried under the desiccator, but only in air with a relative moisture of about 75 per cent, the phase-acceleration ϕ decreased continuously from 0·476 for $\lambda=625\ \mu\mu$ to 0·393 for $\lambda=475\ \mu\mu$. The smallest value was found with a plate for $\lambda=469$ with $\phi=0{\cdot}388$, the greatest for $\lambda=635$ with $\phi=0{\cdot}491$. A pollution of the mercury with $\frac{1}{1000}$ per cent. of lead showed no influence on the phase-variation.

The determination of the phase-variation for the gelatine and albumen film prepared with bromide of silver and dyes was desired for the special end of Lippmann's colour photography. It was, however, not likely that the phase-variation should behave essentially otherwise than the gelatine dried in air, for the latter already behaved as if the gelatine contained an impure surface-layer, and at most so could it also behave with the sensitised film.

The magnitude of the phase-acceleration ϕ on the reflection of light at the mercury determines the distance a of the first *Bauchebene* from the gelatine-mercury surface. For this plane the difference of path between the incident and the reflecting planes must be zero; i.e.

$$O=\frac{2a}{\lambda}-\phi, \text{ therefore } a=\frac{\phi}{2}\lambda,$$

the difference required amounts to $\phi/2$ of that wave-length, which the active light has in gelatine.

PHILIP E. B. JOURDAIN.

AN EDUCATIONAL CONVENTION.

THE Convention of American Professional Photographers, held in Detroit during the past summer, was a notable one, both in what it achieved and in the influence which it appears to be having on other conventions held in the country. In a previous article I have spoken of the American photographer as strongly impregnated with a desire for fraternity, for the meeting together and exchange of ideas. At home in his studio the man appears to be "at home" to all in the craft, who freely come and inspect his methods and ask him questions; and once a year he packs off for a week, usually during the quiet summer season, to spend a holiday with the brethren, examining pictures, listening to talks, picnicing, and swapping ideas. I do not know how many State Conventions there are, in addition to the national one which includes members from all States; but from memory I can recall some twelve or fourteen, and, as many of them are held by the co-operation of two or three States they fairly well cover the whole country. The Convention was notable in that it was a considerable breaking away—by the photographers themselves, not by a clique of them—from the methods of former years.

In the exhibits—an exhibition of work is always a strong feature of a professional convention—all class and sectional divisions and restrictions were abolished; and medals, which in the past have, inevitably, tended to fall into the hands of "moving spirits," were also discarded. The result of the show, taking excellence of work as the gauge, fully vindicated this move. Many men, whose work was too strong, and position too high, to allow them to submit their work in competition to a fallible jury, sent exhibits of their best. The effort was not, perhaps, successful in drawing forth the work of younger or less capable men, but probably a wide inclusion of unknown work would not have strengthened the exhibit.

The Convention "on new lines" had been much looked forward to. The President, Mr. Core—great as a photographer of children in New York—had very definite ideas and a directness of purpose in his intentions, and he was fortunate in having almost a free hand, and the cordial co-operation of his committee. The whole idea seems to have been included in the title by which the Convention is now known—Educational. Incidentally, the conveners managed all to look pleasant, and to have the best of good times. The speeches were all carefully arranged; most of them with distinctly educational tendency—that sort of education which suggests ideas rather than instils concrete facts.

The speechifying and the holiday-making was interspersed, of necessity, with some routine business, interesting to those present, if not to us. Mr. Core welcomed all in an opening speech, in which he thus emphasised the fraternity idea:—

"We want the fullest interchange of ideas; we want the warmest grasp of each other's hands, we need to emphasise the importance of the widest possible membership. The East needs the West, the North needs the South. All are welcome, from the northern boundaries of Canada to Mexico, not only because they are fellow-craftsmen, knit together by a common intent, but because we need their influence, their thoughts, and their experience—the stimulus which their taking the time and trouble to come brings." As a tribute to the history of photography, Mr. W. I. Scandlin showed a series of half-a-century-old paper negatives, by the Le Gray waxed paper method, and taken by Victor Prevost. The negatives in large size—up to 22×18 inches—form the largest collection of early work in the States, and have been literally "rescued from oblivion" by the earnest research of Mr. Scandlin. History was followed by an address on "Old Masters," by Pirie MacDonald. A fine collection of carbon reproductions of "old masters" was a feature of the exhibition, and Mr. MacDonald spoke—not of the works, but of the men who produced them—in much colloquial American. It might almost have been termed a sermon in slang as the speaker showed how the great men were tempered—and tempered their works—by circumstance of constitution or environment. Men, who must have been mere abstractions to many present, were made to live, with their strength and their foibles, as though they were politicians of this present year of grace, rather than foreign names of the long past.

W. M. Hollinger spoke on the general subject of "looking pleasant." This shrewdest of business men and most successful of photographers enunciates a strong theory that everybody has a best side, and if a best side is shown to them they will reciprocate in kind. It is well known that Mr. Hollinger never asks cash in advance; his theory is that the world is honest—given time. He thus describes his practice: "In earlier days I used to tell people when they came up to the desk, 'You will have to pay; don't trust anybody; I treat every one alike.' And the next time we met, that man and I did not feel so kindly towards each other. I learnt after awhile that I could trust everybody, and things moved along very much better, and I got very much more money out of them. There is not a man or woman or a child that is going to cheat you if they can help it, if they think that you are all right. You know that. You may not get your money as quick as you want it, but you will get it. Trust people everywhere and you will get your pay." Advice which is sound for New York.

A feature of American conventions has ever been the presence of an "art critic" to speak on the exhibits and on art in general. Professor Griffith has long been prime favourite, and is an eloquent exponent of many generalities, always ready to be called on and always entertaining.

At the Convention under notice a somewhat new idea was introduced. In the past it has not been uncustomary to call attention to some pictures on the wall to illustrate some point; usually to the commendation of the picture. This year Mr. Lucius Hitchcock, an able and careful critic, has taken pictures and criticised them more impartially than eulogistically. And it is a strange feature of the best American photographers that they are perfectly willing that their pictures shall be analysed and pulled to pieces, and that before a body of several hundred men who regard them as "masters." After speaking on composition—American photographers are at present giving much thought to spacing—Mr.

[7] Wernicke, "Wied. Ann." li., 1894, 448.

[8] "Die Phasenänderung des Lichtes bei der Reflexion an Quecksilber." Diss. Giessen, 1899, in extract in "Wied. Ann." lxviii., 1899, 471.

Hitchcock criticised many of the pictures on the walls. The chemical end of things was not forgotten. Mr. Punnett, a practical plate-maker, spoke on "Practical Chemistry.' One of the most interesting and instructive of the papers was that by F. Dundas Todd. Mr. Todd recently called on a dozen of the best-known photographers in the United States, most of them men of the "new" school, and to each he gave a sitting. The dozen results were exhibited at Detroit, and Mr. Todd passed them under a rapid criticism.

Such are a few of the leading lines of the American Convention of 1901. To educate was its intention, and the intention was consistently kept in view. The proceedings are altogether democratic; everybody may meet everybody, and both hear and ask questions. The instilling of new ideas—ideas not too vague, but with a certain definiteness about them—seems to have been much kept in view. And indeed it must be impossible for a bright, intelligent man to attend a meeting of several hundred fellow-craftsman, mingle with them for a week, and *not* glean ideas. Photographer after photographer has told me in America, that he has learnt much and gained much from his Convention attendances. Is there any possibility of a similar meeting among the British fraternity? The Britisher has not as far to travel as his American cousin, and he is, take the country in all, thicker on the ground. Now that he has, at last, an Association of his own, is it too much to hope that the feasibility of a convention will, at least, be carefully discussed?

WILLIAM EDWARD WARD.

WHO CONTROLS ONE'S PHOTOGRAPH?

[Reprinted from "Wilson's Photographic Magazine."]

[THE items here reprinted from the daily press speak for themselves, and are published for the information of our professional readers. This question of the indiscriminate reproduction of portraits is one which must inevitably become more and more important every year on account of the large use of portraits by newspapers and illustrated periodicals. It is, therefore, equally important that photographers should be well informed, and careful not to exceed their rights in the matter.—ED. "W.P.M."]

The Appellate Division of the Fourth Department has decided that no person has the right to use for business purposes the picture of a woman without the consent of the person whose features are reproduced, and that such use gives sufficient cause for action. The case in question, that of Abigail Roberson against the Rochester Folding Box Company and the Franklin Mills of Lockport, was brought to recover $15,000 damages for the unauthorised use of her portrait for advertising purposes.

When the case was called in the Supreme Court a demurrer was entered. The Court held that there was sufficient cause for action, and it was from this ruling that the defendant companies appealed. On the first argument the Court was divided. In deciding in favour of Miss Roberson on the re-argument, the Court cites the instance of the Siamese twins, and holds that the use of Miss Roberson's likeness would be as unwarrantable as to depict that curious monstrosity without permission.

Miss Roberson will now prosecute her suit in the Supreme Court to collect damages.—"N.Y. Times."

The Control of One's Photograph.—A decision was rendered in the Appellate Division yesterday in the Abigail Roberson picture case, affirming the opinion of Justice Davy that an action in damages lies against one who uses for advertising purposes the picture of a person without his or her consent. Every woman with an attractive face and every celebrity will be interested in the final disposition of this case; and the lawyers will be interested, for the ground of action is without precedent in this State. Miss Abigail Roberson is a beautiful girl of eighteen years who lives in Rochester. A few months ago she learned that her picture was being used in a lithograph advertising a certain brand of flour. Naturally she became the subject of much comment, and the notoriety had such an effect on her health that she took to her bed. By advice of counsel Miss Roberson entered suit for damages against the flour company and against the firm that had produced the lithograph. The declaration set forth that her right of privacy had been invaded, and when the case was tried before Justice Davy, evidence was submitted that she had suffered personal humiliation. The opinion of the Appellate Division was written by Justice William Rumsey. He doubted whether there were any authoritative cases establishing the plaintiff's right to recover. Certainly, as regarded this state, the ground of action was novel. Every person has a right under the common law to immunity from intereference with reputation or character, "or, as it is distinctly stated by Judge Cooley, he has the right to be let alone." Justice Rumsey continued: "I do not see why this principle, the object of which is to give every person a complete immunity from the acts of others which subject him to unnecessary fear or danger, cannot be and should not be applied to such an act as is complained of here. . . . I can see no distinction in principle between an act which without threatening physical harm injures the plaintiff's reputation by word spoken in respect of it, and the like act, which injures her feelings and diminishes the respect with which she is held in the community by saying or doing something in regard to her which tends to bring her into unnecessary and unwarrantable notice."

The Court went even further. Not only did a woman have the right to what should be done with her own photograph, but an attempt to take a picture of her for sale to a painter or publisher would be a violation of her right of property and restrainable by legal process. This opinion, if upheld by the Court of Appeals, will have the effect of making the work of the kodak fiend of doubtful utility to publishers of magazines and pictorial newspapers. It should be law if law is common sense. While the light, which is the chief agent in producing a negative, is free to all, and the camera with which the picture is taken may not be the property of the subject of the picture, the latter may reasonably object to reproduction in a way to cause notoriety or annoyance. Consent is infrequently asked. A beautiful woman who is modest and sensitive sees her picture displayed on the same page with that of a notorious criminal or a celebrity of doubtful repute. Surely her feelings are hurt and she suffers anguish of mind. Why should not the law require that her consent be asked to the reproduction of her picture in any form or in any company? Of course, in a suit of damages it would be necessary to prove the extent of the suffering, until a law is put on the statute forbidding the use of pictures without consent of the subjects. Consent, so overweening is human vanity, it will never be difficult to obtain in many instances; but the person who objects to being paraded in the columns of a newspaper or the pages of a magazine should be protected.—"Evening Sun, N.Y."

THE VIEW FROM RICHMOND HILL.

IN a recent article our contemporary, "The Times," remarked that London has many pleasant suburbs, but there are two which are beautiful, Hampstead and Richmond. In each place there is a sharply rising hill with large open spaces. The open lands of Hampstead not only give wide prospects over town and country, they penetrate into streets and lanes and wander among Queen Anne houses and quaint old cottages. There are many of the features of a picturesque country village within sight of St. Paul's. Richmond has her noble park and famous view. Each of these suburbs has been threatened with irreparable disfigurement. Some years since, Parliament-hill and the adjacent meadow slopes were about to pass into the builder's hands. The effect would have been to ruin the Heath, and Hampstead with it. The threatened lands were rescued; the Heath was doubled in size, and an adequate open space secured on the northern heights of London. Now it is the turn of Richmond. The charm of the renowned view lies in its quiet sylvan character. From the old elms of the Terrace—in perfect harmony with the scene below—the eye wanders over garden, meadow, and wood to the silver waters of the Thames, flowing gently down between green lawns and stately trees. Replace wood and meadow by villas and terraces, by bricks and smoking chimneys, and the Richmond view as we have known it is no more. Some landscapes are on so large a scale, or are seen from so great a height, that details do not greatly matter. In the view from Richmond-hill details are everything. Hence the proposal to build on the Marble-hill Estate threatened ruin to the view. In the very centre of the view are the Marble-hill trees. Sweep them away and the setting of the river is hopelessly changed. Nothing that could be done elsewhere would neutralise the disastrous effect of the conversion of the park of Marble-hill into a building estate.

It was natural, therefore, that, as Hampstead was saved by a large purchase of land on the part of the public, so an attempt should be made to save Richmond by similar means. Sir Whittaker Ellis first called attention to the danger in the public Press. The London County Council at once took action. At their instance a committee representative of local authorities and open space societies, and including such distinguished artists as Sir Edward Poynter and Sir William Richmond amongst its members, was called together, and an option of purchase in favour of the Council was obtained upon payment of a substantial deposit. More recently the Council has consented to find half the purchase money, and to maintain Marble-hill as a public park when it is secured. The total cost of the purchase is put at £72,000. Of this the London Council will find £36,000; and other public bodies

are asked to supply the balance. The Surrey County Council has already undertaken to find £10,000, the Richmond Corporation £5000, and the Twickenham District Council £3000. There is still £18,000 to be made up, and for the whole or greater part of this sum the committee look to the Middlesex County Council and the Corporation of London. Meantime the London Council will apply for the necessary Parliamentary powers to carry out the arrangement.

But the scheme of the committee does not stop here. There are other properties which contribute their quota of lawn and wood to the Richmond view, and it was felt from the first that the opportunity should be taken to preserve, if possible, all the essential features of the prospect, once for all. In the immediate foreground lie the Petersham Meadows of Lord Dysart. These meadows, though liable to floods, have been menaced with building operations from time to time. Some years ago Lord Dysart offered to give them to the public, if he were allowed to enclose Ham Fields and stop up a network of footpaths traversing his estates. The offer was not considered a good one, and the Bill which was promoted by his lordship was rejected by the House of Commons. A much better offer is now made. Not only are all the meadows in the fore-front of the view to be permanently dedicated to the public, but Lord Dysart offers a broad strip on the river bank from Richmond to Kingston to form a waterside garden The committee have approved generally of his lordship's offer, and it is understood that a Bill will be introduced to give effect to it. On the Middlesex side the proprietors of several mansions have handsomely consented to enter into conditions, to be embodied in the Bill of the London Council, which will preclude building on the river bank. Residents at Richmond have pointed out that the scheme will be incomplete unless the river frontage of the Cambridge-house Estate, which runs up-river from the old bridge on the Middlesex side, is also kept intact. It would probably be impossible at the present moment to increase the money burden of the proposed scheme upon the ratepayers. But if the London Council are endowed by Parliament with power to make arrangements in the future for still further securing the view, it is to be hoped that some reasonable arrangement as to this land also may eventually be made.

But the whole project depends on the acquisition of the Marble-hill Estate under the option of purchase held by the Council. That option holds good till the end of this year only; and the Council naturally desire to be assured of the contributions of other local authorities before they pledge the London ratepayers to the purchase. It is said that the Middlesex County Council, from which a substantial contribution is expected, have been advised by one of their committees to annex to their promise the condition that the Council is to take part in the permanent maintenance and management of the Marble-hill Park. Such a condition would, it is feared, endanger the whole scheme. To form a composite board of management for a small park of 68 acres would be both cumbrous and costly. It is admitted that the London Council must have the practical control of any such board, both because it is finding half the purchase money, and because, but for its timely and spirited action, the Marble-hill trees would by this time have been felled, and the view injured beyond remedy. To call complicated machinery into existence without any effective result is not a course which can commend itself to those who desire the speedy and simple solution of the problem how to save the view from Richmond-hill. It is earnestly to be hoped that the Middlesex Council will show that public spirit which has marked its action on other occasions, and will aid London in putting beyond risk of harm a prospect of world-wide renown by offering a free and generous contribution towards the necessary expenses.

RHYS WILLIAMS *v.* KODAK, LIMITED.

The concluding stage of this case was heard by the Lord Chief Justice of England on Friday, December 6.

Mr. Danckwerts, K.C., Mr. J. E. Raven, and Mr. Æneas Mackintosh were for the plaintiff; Mr. Moulton, K.C., and Mr. D. M. Kerly for the defendants.

Mr. Le Couteur, who gave evidence for the plaintiff on the last occasion, was further cross-examined by Mr. Moulton. He produced the written orders given by the Photographic Association, Ltd., to the defendants for the films in question, and he stated that the Association had made a contract not to sell under the retail list prices, and they used to sell at these prices. There were goods on the invoice for other members than the plaintiff.

The Judge: The whole point is whether it is to be treated as a resale or a purchase by agency.

The witness, in further cross-examination, said that the defendants allowed him the price of the films, but there was no allowance for development, though he made a claim.

Mr. Moulton: I put it to you that there was an allowance for development.

The Judge: What difference will it make?

Mr. Moulton: If it was Mr. Rhys Williams's contract, there could not be a claim for development.

For the defendants, Mr. George Davison, their managing director, stated that he was an experienced photographer. In selling to the public the defendants allowed no discount on their retail prices. They allowed 10 per cent. discount to professional photographers and a varying discount to dealers. In the case of the goods sold to the Photographic Association they knew no customer except the Association. They would not have sold direct to Mr. Rhys Williams on those terms. They sold a large number of films—millions a year.

Mr. Moulton: Have you many complaints?

Witness: Very few indeed.

The Judge: You have a good many, but in proportion to your business the number is small?

The witness, continuing, said that it was impossible to say that the defects in the films produced were due to manufacture. They made the films in long strips and they took samples from the middle and from each end. Some were tested and some were stored. If the tests were not satisfactory, the films were not sent out. He had tested those that were stored, and they were perfectly satisfactory. It was impossible to say what was the cause of the defects in the films produced, but they might be caused by heat or gaseous fumes or physical injury. There never was a defect in a film that was exposed and developed when it was sent out. Dirt on the celluloid would produce a black mark on the negative, and a white mark on the picture.

Cross-examined by Mr. Danckwerts: He knew that there were members of the Photographic Association and that the latter bought for its members. He did not know they had no stock. The emulsion was delivered by a machine upon the celluloid which was flat upon a table upon which it was made. The celluloid set in a thin layer. It did not go through rollers, but was poured out. It took from eight to ten hours to harden. During that time there were workmen about. After the emulsion was delivered the room was shut up, as it had to be put on in the dark. Dirt would not produce the marks complained of. Dirt would show black in the negative.

The Judge, looking at a photograph of some negroes, said that the petticoats of one of the gentlemen showed both black and white marks.

The witness said that a finger could not cause the marks in question. About one film in 100,000 showed these marks, which were the result of wrong keeping or physical violence. The films in question were, he presumed, made in Europe, but they had never been given the emulsion number.

Re-examined: He had never authorised trade discount to be allowed to the Photographic Association except as dealers.

Sir William Abney stated that in his opinion the cause of the defects in the films was climatic. Fastening up the films in tins and sending them to a warm damp climate was the best means of damaging them. He thought the marks due to physical injury. He could not say that they were the result of defects in the original film. If there was dirt between the celluloid and the emulsion, it would not produce the marks in question.

Cross-examined by Mr. Danckwerts: Look at this Kodak tin. How do you suggest the injury took place?—I am not acquainted with the details; I am only here on subpœna.

Continuing, the witness said that the damage would take place more rapidly when the film was put in a tin. Development had nothing to do with the defects. If the films were badly rolled up at the factory or badly rolled on to the other spool in the camera, it might cause injury. He did not call the marks finger-marks.

Mr. Harold Senier, the manager of the defendants' factory at Harrow, said that there was no hand work in making the celluloid or spreading the emulsion. There was no polishing. He had no reason to believe that any of the batch in question was bad. There was in the films produced nothing to show any defect in manufacture. The emulsion was very sensitive to friction and pressure as well as to light. He thought the defects were caused by friction and pressure when the emulsion was exposed to heat, moisture, or gases. They were not due to finger-marks.

Cross-examined: No one was allowed in the room after the celluloid was spread until it was dry. People were there when the emulsion was being spread by a machine, which was worked by power. It was rolled by girls on to the ordinary trade spools.

Re-examined: Their hands might come in contact with the film, so they wore white gloves.

Mr. Gambier Bolton, a public lecturer, said that he had taken photographs throughout the world, and had found that in tropical countries it was necessary to take precautions. He put calcium chloride inside the tin to take up the damp. The films should be exposed and developed within half an hour of being taken out of the tin. The defect on the film produced was not a finger-mark, but was caused by the buckling of the film in the camera, owing to the damp and its pressing against the back.

Cross-examined: He had had to give up films altogether for work like this, owing to difficulties of this kind.

The Lord Chief Justice, in delivering judgment, said that there was a very important point raised which it was not necessary for him

to decide, and he reserved his opinion as to what was the position of a gentleman who had ordered goods by means of such an agent as this, as to whether he could maintain an action, and whether he could recover damages directly against the defendants. In this case he was of opinion that the plaintiff had failed to prove that the films were defective and not commercially suitable at the time when they were supplied by the defendants. His Lordship accepted the position pressed on him by Mr. Danckwerts that the manufacturer undertook to supply proper films, but in this case the films were in the possession of the plaintiff for a considerable time, and it lay in him to show that the defects were due to improper manufacture. It was said that the defect was due to dirt between the celluloid and the emulsion or to the celluloid's not having been properly cleaned or polished, and it was said that one could see finger-marks on the negatives. There was certainly on one of them a mark which roughly resembled the outline of a finger. But the case could not be decided on one film alone. There were nine others in which there were other defects, and he was clearly of opinion that it was not established that they were due to any want of care in manufacture. He was satisfied by the evidence that, speaking generally, no fingers would approach the films at the time when the impression could be made in the way suggested. It was possible that there might be a touching of the film when it was being wound on the spool, but that was not the case which was opened. He therefore was of opinion that the case failed so far as the plaintiff's evidence was concerned. He thought it right to say that he was satisfied that there were many causes that might bring about similar defects in perfectly good films. He was satisfied that it was quite as probable—he would say much more probable—that the injuries were caused after the films were in the hands of the Photographic Association or of the plaintiff, as before. The plaintiff had not satisfied him that the films were defective when supplied, and therefore his case failed.

Judgment was accordingly given for the defendants, with costs.—"The Times."

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Edinburgh Branch.

A meeting of the above Association was held at Mr. Balmain's Studio, 69, Shandwick-place, Edinburgh, on Wednesday, November 27. There was a good attendance. In the absence of Mr. Crooke, Mr. Moffat occupied the chair.

Mr. Yerbury referred to a letter published in The British Journal of Photography some weeks ago in favour of allowing assistants to become members of this Association, which he strongly condemned, and urged that members should consist of masters only or responsible managers.

The Society then discussed what constituted a dealer.

Mr. Heaven gave the names of several so-called dealers who openly advertised as photographers, offering to photograph groups, houses, etc., at considerably reduced prices. An interesting debate also took place on the prices of plates, chemicals, and discounts. At the conclusion, the Chairman said that such intercourse and free exchange of ideas between professional photographers would be of the greatest benefit to them.

Three new members were added to the roll. The proceedings terminated with a vote of thanks to Mr. Balmain for the use of his studio.

New members elected at the Committee meeting Friday, December 6, 1901:—

Bain, Francis S., Banks-road, West Kirby
Bibbs, Herbert W. (A. and G. Taylor), 63, Princes-street, Edinburgh.
Cooper, Frederick Arthur, 32, Hamilton-square, Birkenhead.
Cooper, Joseph, 48, South-road, Waterloo, Liverpool.
Cowper, William Nelson, 13, Parker-street, Liverpool.
Foulds, Thomas (Foulds and Hibberd), 33, Sandy-Road, Seaforth, Liverpool.
Hibberd, Samuel M. (Foulds and Hibberd), 33, Sandy-road, Seaforth, Liverpool.
Horne, John Knox, (J. K. Horne and Crawford), 223, High-street, Portobello.
Johnson, Ambrose (as Ambrose), 380, Stanley-road, Liverpool.
Johnson, William (Ovinius Davis), 16, Princes-street, Edinburgh.
Lawrence, William, 5, 6, and 7, Upper Sackville-street, Dublin.
Mayburg, Alfred Edward (as "Bobs"), 13, Great George-place, Liverpool.
Platt, James Bradshaw, 131, Upper Stanhope-street, Liverpool.
Pugh, William Henry, 192, London-road, Liverpool.
Saronie, James, 93, Grange-road, Birkenhead.
Smith, William Thomas, 126, Bold-street, Liverpool.
Thompson, George Edward (Robinson and Thompson), 4a, Hardman-street, Liverpool.

Our Editorial Table.

Messrs. John Walker and Co., Ltd., of Farringdon House, Warwick-lane, E.C., are issuing two portfolios of character studies from the play of "Herod," lately staged by Mr. Beerbohm Tree at Her Majesty's Theatre. The negatives were taken by Messrs. Langfier, Ltd., and the reproductions are nicely printed in half-tone. These souvenirs of a notable play retail at one shilling the set.

"New Zealand Illustrated" is the title of the Christmas number of the "Weekly Press" (Christchurch, N.Z.), which is the largest illustrated journal published south of the line. There are over 150 half-tone reproductions in the number, from negatives chiefly made by Mr. Walter Burke, F.R.P.S., of the "Press" staff. The whole of the work was turned out in the office. We congratulate our contemporary on the production of an interesting survey of New Zealand's scenic and material advantages.

"Photograms of the Year 1901" (published by Messrs. Dawbarn and Ward, Farringdon-avenue, E.C.) again makes it appearance amongst the photographic annuals. The numerous reproductions of recently exhibited photographs give one a good idea of the latest output of pictorial work, and the book, which is handsomely produced, should be widely appreciated on that account. The letterpress follows former lines, Mr. A. C. R. Carter being one of the principal contributors.

A new edition of Mr. George Wheeler's useful and practical volume on "Photographic Enlargements: How to make them" has been published in a revised and modernised form. The formulæ for toning bromides, given at page 107, contain much information on a point that very frequently forms the subject of queries addressed to us. The handbook, which is an old favourite of ours, and deserves very high recommendation, consists of 132 pages, and is obtainable (price 1s.) from Messrs. Geo. Wheeler and Co., 46 King-street West, Manchester.

"Anthony's International Annual for 1902," price 2s., is published by Messrs. Iliffe and Sons, Ltd., of 3, St. Bride-street, E.C. who this year assume the sole British agency of the volume. It consists of about 400 pages of articles, illustrations, formulæ, and advertisements, and as a production is beautiful to look at, the pictures, printing, and paper being extremely good. Among the contributors are Dr. R. W. Shufeldt, who writes and illustrates "Some Recent Work in Zoological Photography," and "Shells and Shell-photography;" Mr. W. H. Walmsley, whose subject is "Photo-micrography with a Camera."

News and Notes.

We regret to announce the death of Mr. Charles Burr, the once well-known lens-maker, who passed away on the 25th ult.

Captain Percy Scott, R.N., has cabled to Messrs. Adams and Co., instructing them to forward a best quality Adams Reflex complete for use on the "Discovery" Antarctic Expedition.

Richmond Camera Club.—On December 5, slides by Mr. John H. Gear, illustrating Venice, were to be shown, but, owing to his want of leisure, a miscellaneous series was substituted.

The Photographic Club will be pleased to welcome any of our readers at its meeting on Wednesday, December 18, at 8 p.m., at Anderton's Hotel, Fleet-street, when Mr. G. T. Harris will read a paper on "Some applications of light filters in landscape photography."

Leicester Literary and Philosophical Society (Section G, Photography).—A meeting of this Society was held in the Council Room, Town Museum, Princess-street, on Friday evening last, December 6, when Mr. G. Bankart gave a lantern lecture entitled "Views in Belgium." Mr. Pickering's demonstration of emulsion-making was postponed owing to indisposition.

Cripplegate Photographic Society.—The third annual Exhibition of the Cripplegate Photographic Society will be held from February 25 to 27, 1902, at the Cripplegate Institute, E.C. Entry forms are now ready, and can be had on application to the Hon. Secretary, Mr. Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C., of whom full particulars can be obtained. Prospectus of trade section sent on application enclosing trade card.

The National Photographic Record Association has received a valuable addition to their collection from the Editor of the "Amateur Photographer," being the prints sent in for their prize competition. The contribution comprises views of Tintern Abbey, etc., by F. Littledale, for

which the gold medal was awarded, and prints by A. J. Loughton, F. R. Armytage, Mrs. Gandy, F. Parkinson, E. J. Felie, C. Gethin, Miss L. Beedham, and a fine collection of old Scotch work by B. Diveri.

THE Certificates of Opticians.—The eighth examination in connection with the diploma scheme of the Worshipful Company of Spectacle-makers was held last month, the proceedings being opened by the Master of the Company, the Right Hon. Sir W. Hart Dyke, Bart., M.P. The examiners were, as usual, the Rev. J. Henry Smith, B.A., Chaplain to the Company; Prof. Silvanus P. Thompson, B.A., D.Sc., F.R.S.; Mr. G. Lindsay Johnson, M.A., F.R.G.S., and Mr. W. H. E. Thornthwaite, F.R.A.S. The following is a list of the successful candidates:—Full examination: H. Carter (London), W. G. Carter (London); R. J. Fleming (London); F. H. Lewis (Reading), E. J. Targett (Bolton), G. Williams (London). Modified examination: A. H. Bellefontaine (London), J. Course (Royston), T. Forbes (London), W. Geddes (Gravesend), W. F. Huntley (London), A. Jones (London), I. R. Phillips (Abergavenny), W. H. Wilkins (London), H. W. Withers (New South Wales, Australia). The diploma of the Company will be issued to the above-named in due course.

SUNDAY at the Museums.—Mr. Mark H. Judge, Honorary Secretary of the Sunday Society, writing to the daily press last week, says:—"Last Sunday completed the first decade since the Sunday Society commenced its record of the number attending the National and Municipal Collections of Art and Science on the anniversary of Museum Sunday. The success of Sunday opening has been so great that already it is a matter of course, and the figures have long since lost the special interest they once had. It may, however, be worth while to give in round numbers the figures for London, Dublin, and Edinburgh. They are as follows:—London, 8500; Dublin, 5000; and Edinburgh, 2100. It is to be regretted that, with such figures to prove the success of Sunday opening at the Museums, the Picture Galleries in the Metropolis should not be open during the winter months. Surely the Trustees of the galleries will soon follow the example of the Trustees of the museums, and admit the people on their leisure day at this season of the year, when the climate is not always such as to make the parks available to any but the most robust."

SOUTH Manchester Photographic Society's Annual Exhibition.—This Society, which was formed on December 8, 1900, and has now a membership of over eighty, has just celebrated the close of the first year of its existence by holding an exhibition of members' work. The Exhibition, which was an unqualified success, was opened on Tuesday, the 3rd inst., and remained open for two days. It is estimated that the total attendance of visitors and members was well over 500. The whole of the arrangements for the Exhibition were placed by the Committee in the hands of Messrs. A. E. Casson and W. J. Pearce, and the results more than fulfilled the expectation of the Committee. The members of the Society responded splendidly to the calls made upon them by Messrs. Casson and Pearce, with the result that about 300 contributions were received. The Committee had decided that all work sent in was to be hung, and the quality of the exhibits fully justified their decision. A number of slides made by members were shown through the lantern each evening, and were received with great enthusiasm by the large audience. Among those who contributed specimens of their work were Messrs T. Morley, Brook, A. E. Casson, W. J. Pearce, T. W. Handley, E. Lee, G. Lynde, and F. T. Overmann, who each contributed several pictures. Among the other exhibitors were Dr. Westmacott, Messrs. Stromeyer, C. Holding, F. O. Pickard, T. Woodruff, W. E. Wood, S. Hall, G. Ashworth, W. H. Young, F. P. Bayley, P. H. Jordan, E. J. Davies, E. Enderlein, J. R. Gibbs, F. Hesse, G. Kirman, C. Horkheimer, and F. Higginbottom.

ROYAL Institution.—The following are the lecture arrangements at the Royal Institution, before Easter:—Professor J. A. Fleming, six lectures (adapted to young people) on Waves and Ripples in Water, Air and Æther; Dr. A. Macfadyen, six lectures on The Cell: its Means of Offence and Defence—Immunity; Mr. W. N. Shaw, two lectures on the Temperature of the Atmosphere: its Changes and their Causes; Professor E. B. Poulton, two lectures on Recent Researches on Protective Resemblances, Warning Colours, and Mimicry in Insects; Dr. A. S. Murray, three lectures on Recent Excavations at Delphi and in the Greek Islands; the Rev. John Watson ("Ian Maclaren"), three lectures on the Scot of the 18th Century:—1, At Home; 2, In Kirk; 3, With his Books; Sir Henry Craik, two lectures on Scotland's Contribution to the Empire; two lectures on Caricature in and out of Parliament, by Mr. E. T. Reed; four lectures on the Landmarks in the History of Opera: Gluck, Mozart, Weber, Wagner, by Mr. W. H. Hadow; six lectures on Some Electrical Developments, by Lord Rayleigh. The Friday evening meetings will commence on January 19, when Lord Rayleigh will deliver a discourse on the Interference of Sound. His Grace the President will, after the discourse, unveil and present to the Institution, on behalf of the subscribers, a bust by Mr. Onslow Ford, R.A., of Sir Frederick Bramwell, Bart., Honorary Secretary of the Royal Institution from 1885 to 1900. Succeeding Friday evening discourses will be delivered by Mr. H. G. Wells, Professor A. Crum Brown, Professor Arthur Gamgee, Major P. A. MacMahon, Mr. W. Duddell, Professor Henry A. Miers, Professor H. Becquerel, Professor E. Ray Lankester, Geheimrath Professor Otto N. Witt, and other gentlemen.

THE Stonehouse (Devon) Camera Club's First Exhibition.—The first Exhibition of the Stonehouse (Devon) Camera Club was held on Tuesday and Wednesday, December 3 and 4. As was said by the local dignitaries who took part in the ceremonies, the show was really a remarkable tour de force for a Society which has hardly completed a year of its age, and the Club showed a creditable spirit of enterprise in undertaking a task of such magnitude so early in its career. But the adventure was thoroughly successful, and drew a large attendance of the public, who were pleased by an excellent display of about 200 pictures and a large collection of lantern slides. The four classes for competition drew a large entry, the open class being favoured by R.P.S. exhibitors, and, as was only natural, in view of the Club's habitat, a considerable proportion of the pictures were seascapes, but there was a good deal of figure work, and the pictorial attractions of the show were much enhanced by a loan collection from the R.P.S. Mr. S. H. Paynter acted as Exhibition Secretary, and the judges were Messrs. W. D. Snell and H. Fitch (Stonehouse), and J. Trouern Trend (Plymouth). At the general meeting of the Club on the first night, the following officers were elected for the ensuing year:—President, Dr. W. H. Waterfield; Vice-Presidents, Messrs. G. T. Bayley and F. W. Tucker; Hon. Secretary, Mr. R. H. Walling; Treasurer, Mr. J. C. Smith. The classes for competition were as follows:—Members: Class A, for the best picture submitted for monthly competition; Class B, for pictures by any process of any subject; Class C, lantern slides in sets of four. Open: Class D, open to all, any subject by any process. Awards.—Class A—Silver medal, W. Rose, South Down, Millbrook; certificate, S. H. Paynter, landscape with trees. Class B—Silver medal, D. Berlin ("Cassius is aweary of the world"); bronze medal, R. H. Walling (sea and sky); certificates, J. C. Smith ("The Young Fisher"), J. Warne ("Royal Marines' Church Parade"); special certificate, D. Berlin ("Estuary of the Plym"). Class C (lantern slides)—Silver medal, A. J. Catford; bronze medal, F. W. Tucker; certificate, J. C. Smith. Class D (open)—1, silver medal, C. E. Walmsley, Ambleside ("Summer's Increase"); 2, silver medal, C. Smallridge, Ivybridge ("A Creek on the Erme"); certificate, A. E. Atfield, Llanelly ("Truly Rural"), C. J. King, Isles of Scilly ("Narcissi"); special certificate, A. Gray, Whitby ("Harvesters").

THE Southsea Exhibition.—The following were the awards in the open classes:—Class H Landscape and River Scenery.—Silver medal ("Woodcutters"), C. F. Grindrod; bronze medal, ("Summer's Increase"), C. E. Walmsley; certificate, ("Lewes Castle"), J. Austin. Class J, Marine and Cloud Studies.—Silver medal, ("Rock-thwarted"), C. J. King; bronze medal ("Evening on the Dunes"), W. J. Croall, F.R.P.S.; certificate, ("From whence and whither bound"), E. R. Collins. Class K, Portraiture and Figure Studies.—Silver medal ("The light of other days"), R. S. Webster; bronze medal ("A Lull in the Storm"), John H. Gash; certificate ("Day-dreams"), T. Page Croft. Class M, Hand-camera and Instantaneous Work.—Silver medal ("Hand-camera studies"), Percy Lewis; bronze medal ("Tobogganing"), Captain T. A. Blight; certificate ("Venetian Scenes") E. G. Bonn. Class N, Still Life, Flowers, Fruit, &c.—Silver medal ("Blackberry Blossom"), Mary C. Eames; bronze medal ("Flowers that Bloom in the Spring"), J. C. H. Wallsgrove; certificate ("Spray of Blackberries"), Cherry Kearton; special bronze medal ("Ice Flowers"), Captain T. A. Bligh. Class O, Architecture.—Silver medal ("Across the Nave, St. Mark's"), John H. Gear, F.R.P.S.; bronze medal ("St. Apollinaire, in Classe"), Dr. E. G. Boon; certificate ("The Font, York Cathedral"), S. R. Midgeley; certificate ("The arched and ponderous roof rose high"), Sydney A. Pitcher. Class P, Alpine Photography.—Silver medal ("Lauterbrunnen"), D. Deely; bronze medal ("The Mine Glacier"), Miss M. Woods; certificate ("Evening Clouds on the Matterhorn"), John Gunston. Class R, Lantern Slides.—Section 1, Landscape and Marine, etc.: bronze medal, John Gunston; certificate, Graystone Bird; Section 2, Figure Studies, Animals, etc.: Bronze medal, Fred Marsh; certificate, Graystone Bird; Section 3, Architecture and any other subject: bronze medal, Eustace Young; certificate, Cherry Kearton; special certificates, Frank Gregg, John H. Gash, and C. B. Howdill. The "A. P." special silver medal (presented by A. Horsley Hinton, Esq., Editor of "The Amateur Photographer"), John H. Gash. Class S, Any subject not included in foregoing Classes.—Silver medal ("Charging Retorts, Gas Works"), Fred Marsh, F.R.P.S.; bronze medal ("Butterflies"), Douglas English; certificate ("Steady"), W. J. Croall, F.R.P.S. Class Z, Trade Exhibits and Photographic Novelties.—Silver medal (eight sets of lantern slides), Graystone Bird; bronze medal ("Queen Victoria's Funeral"), Russell and Son; certificate ("Shamrock II."), G. West and Son. Special gold medal for best average work, Percy Lewis; special silver medal (presented by P. R. Salmon, Esq., Editor of "The Photographic News"), John H. Gash; special bronze medal (extra), R. S. Webster; special bronze medal (extra), John H. Gear.

AT the Franklin Institute, on November 20, 1901, Mr. Frederic Ives read a paper on "The Half-tone Trichromatic Process." He commenced by comparing it with the chromo-lithographic process, pointing out that whereas in chromo-lithography from seven to twenty drawings, stones and impressions are required for each subject, the half-tone trichromatic process aims to produce equally good results with three plates, produced photographically, and three impressions, in the ordinary type press. This process had been exploited commercially only within the last ten years, and was already a competitor of chromo-lithography for many purposes, but was generally operated upon a basis scientifically imperfect, and involving so much dependence upon skilled hand work to perfect the printing plates, that the quality was very uneven, and so often really bad that nothing but its comparative cheapness made it acceptable. The speaker had always contended that it should be possible to obtain high-class results without hand-work if the process was carried out on a correct scientific basis, with photographic negatives made by a process of quantative colour selection such as he had indicated in a paper which he had read at the Franklin Institute in 1888, and the results which he now showed were produced in that way. Another source of error in the operation of the process was due to the practical impossibility of making the three elements, either negatives, etchings or prints, by separate successive operations, without introducing differences of gradation which produced an alteration of hue in the mixed colours. He had overcome this difficulty, and at the same time cheapened and otherwise facilitated the operation of the process, by devising cameras to make the three images at one exposure, on one sensitive plate, so that every operation was made

exactly the same for all of the trichromatic elements. One of these one-plate-one-exposure cameras was shown, together with one of the negatives, a set of the half-tone blocks and several specimens of the printing. Allusion was also made to a new multi-colour printing press, upon which the printing could be done with perfect success with a single run of the paper through the press, thereby eliminating differences of hue and defects of register commonly introduced by the effect of atmospheric changes when only one colour was printed at a time. The speaker stated that he was really the original inventor of the half-tone trichromatic process, and showed a specimen which he produced in 1881, more than ten years before the process was patented by others, as well as references to this specimen in the "Photographic News," 1884, and the catalogue of the Novelties Exhibition, 1885. That he was not the first to urge the commercial exploitation of the process was due, he said, to the fact that its success depended, among other things, upon conditions in the printing office which were even now only approximately realised, after a long process of evolution, which had been greatly stimulated by the introduction of the half-tone process.—"Philadelphia Times," Nov. 24, 1901.

Aerial Navigation.—At a meeting of the Aeronautical Society, held recently at the Society of Arts, a paper was read by Sir Hiram Maxim on "Aerial Navigation by Bodies Heavier than Air." Discussing the possibility of navigating the air with balloons, he gave a short history of what had already been done in this way. Soon after the Franco-German war the French Government had taken up the question of dirigible balloons, and Renard had succeeded in making short excursions and returning to his starting point. He had often been said to have done all there could be done, but he had never used a petroleum motor to drive his machinery. M. Santos Dumont had done so, and had thus driven his balloon at a greater pace than had ever been reached before, succeeding in making excursions and returning to his starting point even in face of an adverse wind. But the strength and lightness of his balloon were both about as great as possible, and the same was true of his motor; hence, so far as balloons were concerned, it did not seem possible greatly to improve on his results, which seemed to come very near the line beyond which no one could go. No matter how powerful the motor could be made, it was not possible to make the balloon strong enough to stand being propelled through the air at more than a certain pace. Hence the possibilities before balloons were very small. Sir Hiram Maxim then turned to the problem of flying by means of bodies heavier than air—a subject in which he said scarcely a beginning had as yet been made—and recapitulated some of the results he obtained with his well-known flying machines a few years ago, when his experiments demonstrated that a machine on a large scale could be made to develop a lifting effect greater than its own weight. At that time the steam engine seemed the best motor to be employed, but now, he thought, the petroleum motor would yield better results. Now, too, there were aluminium alloys which were as strong as wrought iron while as light as aluminium itself, and these were infinitely better than anything that was in the hands of engineers when he made his experiments. Hence, with an improved motor and materials, and with pluck, skill, and money, an actual flying machine was not only possible, but practicable, and when produced would be of immense value to the Empire for military purposes. Mr. William Marriott, Assistant Secretary of the Meteorological Society, then spoke about "Atmospheric Currents," after which Mr. Eric Stuart Bruce, the Hon. Secretary of the Aeronautical Society, made some remarks upon M. Santos Dumont's ascents. He pointed out that for the first time in history the Brazilian aeronaut had succeeded in steering a balloon from a given point round a given point in a given time. His ingenuity and originality had enabled him to make a real advance in overcoming the force of the wind, as was shown by the fact that, according to the gauges on the Eiffel Tower, the velocity of the wind on the day on which he won the Deutsch prize was 4½ metres a second at the time of starting, and 6 1-10th metres at the time when he rounded the Tower. If any more prizes were offered for dirigible balloons, Mr. Bruce thought it should be made a condition that the trials took place when the wind-force was not below a certain value.

Redhill and District Camera Club Exhibition.—On Friday, November 29, this Club held its third annual Exhibition and conversazione at the Market Hall, Redhill. A large number of photographs were entered for competition, and were judged by Mr. Charles Moss. The awards were Class 1, Pictorial.—Section A: Medal, Mr. T. P. Padwick ("Sundown"); certificate, Mr. H. Speyer ("A Yorkshire River"). Section B, Novices.—Medal, Mr. Torrance ("Mending Nets"); certificates, Miss Tozer ("Surrey Pine Woods"), and Mr. C. Trevarthen ("Sailing Barges"). Class 2, Technique.—Medal, Mr. Dunning (negatives); certificate, Mr. P. Candy (negatives). Section B, Enlargements—Medal, Mr. J. O. Grant ("Primroses"); certificate, Mr. P. Candy ("The Crypt"). Class 3, Scientific.—Medal, Mr. F. Martin Duncan ("Photo-micrographs"); certificate, Mr. Cherry Kearton ("Natural History"). Class 4, Lantern Slides.—Section A: Medal, Mr. Cherry Kearton; certificates, Mr. F. Martin Duncan and Mr. T. P. Padwick. Section B (Novices): Certificate, Mr. C. J. Trevarthen. President's medal (for best picture in the circulating portfolio for the year), Mr. T. P. Padwick. Mr. Padwick's "Sundown," "Morning on the Thames," "A Restless Sea," and "Shrimpers" were four particularly pleasing pictures, full of delicate tones, and showing considerable artistic as well as technical skill. Mr. Henry Speyer exhibited some of his beautiful Alpine photographs, for which he has won such a high reputation, and which were much admired. His "Yorkshire River" was a charming study, and showed clearly that Mr. Speyer is by no means a "one subject" man, but quite as appreciative of the simple beauties of a Yorkshire dale as of the majesty of some mighty snow-crowned Alp. Amongst the novices, Mr. Trevarthen's delicate seascape, "Sailing Barges," Miss Tozer's "Surrey Pine Woods," and Mr. Torrance's clever group of figures, "Mending Nets," were particularly pleasing. Dr. H. J. Blackler had two very striking pictures of Madeira, one showing the harbour, Santa Cruz, not only being of topographical interest, but displaying considerable artistic merits. His second picture had an element of humour as well as interest for its motif; the familiar sledge, piled high with logs of wood, and drawn by a pair of patient oxen, has overturned, and two natives are busily collecting the fallen logs. Some very good Zoo studies were shown by Mr. J. O. Grant. Two interiors by Mr. P. Candy, entitled "A Village Kitchen" and "The Crypt," deserve praise. In the scientific section, Mr. F. Martin Duncan exhibited an interesting series of photo-micrographs, covering a wide range of magnification, from 20 to 1400 diameters. He gained a medal for a series of photo-micrographs of sections of plant stems, and his "Bacteria," "Stomata Region," and "Medium-power Photo-micrographs" attracted considerable attention. Mr. Cherry Kearton showed some of his well-known and beautiful studies of bird life. The Club is to be congratulated on having so distinguished an exponent of animal photography as Mr. Kearton as a member. During the evening, Mr. E. S. Bruce, M.A., gave an exhibition of his invention, the "Aerial Graphoscope," an instrument for demonstrating, by means of a revolving lath, the phenomena of the persistence of vision. Demonstrations of the X-rays were given by Messrs. Fowler and Co., and some beautiful experiments with drops and jets of water by Mr. W. T. Burgess, F.I.C., F.C.S. After a short selection of music, the evening's entertainment was brought to a successful close by a lantern exhibition of prize and competing slides. The medals and certificates were presented to the successful competitors by the Lady Mayoress.

Commercial & Legal Intelligence.

Robbery at a Photographer's.—A daring burglary was perpetrated in Cheltenham last week. A man entered the shop of Messrs. Norman May, and Co., photographers, and levelled a revolver at Mrs. Tuck, the wife of the manager, who was alone in the shop. The intruder informed her that he had come for the money, and immediately walked to the safe in the rear of the shop. Mrs. Tuck rushed out to secure assistance, but when she returned the thief had disappeared with all the money from the safe. No arrest has yet been made.—"Standard," December 6, 1901.

Shareholders' Responsibility.—Last week Justice Wright had before him the matter of the Secco Films (British and Colonial), Ltd., which came up on a summons to vary the list of contributories. The application was by a Mr. Corstorphine, who wished to have his name removed from the share register. He said he applied for shares in the company, and sent a deposit, but later he cancelled his application. He never received notice of allotment, and it was for the liquidator to prove that the notice had been sent. For the liquidator it was stated that the notice was duly posted, his name appeared in the register, and he was therefore liable for the shares.—His Lordship said he was not satisfied that the cancellation was properly posted, and applicant must remain on the register. Appeal dismissed, with costs.—"People," December 8, 1901.

Soon after half-past eleven on Saturday night the alarm was received at the Redhill Police Station of a fire at Messrs. Smith and Co.'s photographic studio in Station-road, Redhill, a building constructed of iron and wood, situated at the rear of the premises. The members of the brigade were instantly called, and in a short space of time three men left with a hose, but by the time the engine had arrived the roof had fallen in, and all that was left of the studio was a heap of smouldering ruins. The fire was first discovered by Mrs. Smith as she was retiring to bed at about 11.25. She immediately raised the alarm, and, with the assistance of P.C. Skeggs (who resides opposite the premises), she and her husband did all they could to check the conflagration, prior to the arrival of the engine, by throwing water over the flames, and over the roof the house, which for a time stood in danger. It is supposed that the fire originated through a lighted candle being accidentally left in the dark room. The dwelling-house and studio were insured together for £400, and the damage is estimated at £100.

The following letter, signed "F. Wakefield," appeared in the correspondence columns of the Journal for November 8:—"In a recent issue of the 'Black and White Budget,' they used a photo of mine, and (as per their advertisement in the Journal) I wrote for the usual fee, but their reply was a blank refusal, adding that under the existing copyright laws I had no legal standing. Therefore I should like my brother professionals to know how 'Black and White' treated me, that they might not expect to get a small fee, as I did, for the use of their productions which they advertise to give you." We are informed that the photograph referred to by Mr. Wakefield was not his copyright, and that he had no legal or moral right to the fee demanded. We are sorry that our columns were employed for the publication of statements which are contrary to the facts, and that it was insinuated against our contemporary, the "Black and White Budget" that it refused to pay the proper fee for the use of a copyright photograph. We are assured there is no foundation for such an allegation, and we express regret to our contemporary for its publication in our columns.

Copyright Case.—Last week (before Mr. Justice Phillimore and a Common Jury) the case of Hanfstaengl v. British Mutoscope and Biograph Co., Ltd., was heard. It was an action brought by Mr. Franz Hanfstaengl, of 16, Pall Mall-east, against the British Mutoscope and Biograph Co., Ltd., of 18 and 19, Great Windmill-street, for an injunction to restrain the defendants, their servants, and agents, from publishing, importing, selling, exposing for sale, or distributing any copies or colourable imita-

tions of the plaintiff's copyright works "Marguerite," by Mengler, "Virgin and Child," by Bodenhausen, and "A Song without Words," by Poltzelberger, or any other of the copyright works of the plaintiff. Mr. Bray, K.C., and Mr. Adler appeared for the plaintiff; Mr. Young, K.C., and Mr. E. H. Brydges for the defendants. It appeared that the plaintiff was the owner of the copyright in the three paintings, which were produced in Germany and were first published by him in Berlin subsequent to the Berne Convention of 1886. The plaintiff was entitled to the sole copyright in the paintings in the United Kingdom. Repetitions, copies, and imitations of the pictures have been made by Messrs. Sword Brothers, of Philadelphia, or by some other person, without the knowledge or consent of the plaintiff, and the plaintiff complained that the defendants had caused to be imported, sold, published, exhibited, distributed, and offered a number of the repetition, copies, and imitations without the plaintiff's consent, and well knowing the same to have been made unlawfully. The defendants said that they imported from Messrs. Sword Brothers, of Philadelphia, in the United States of America, a consignment of photographs of a number of different paintings, including the three paintings, and that they sold one large and one small photograph (and no more) of each of the three paintings to the London and District Mutoscope Company, Ltd., at 6d. for each small and 1s. 3d. for each large photograph, and admitted that the six photographs were so imported and sold without the plaintiff's consent, but they denied that they had any knowledge at the time when the photographs were imported by them or subsequently until November 7, 1900, that the same or any of them had been made unlawfully or that the importation or sale thereof was wrongful, or that the plaintiff or any other person was the owner of the copyright of the paintings or any of them. Before purchasing the photographs the defendants were assured by the consignors thereof that none of the consignment was the subject of copyright, and they believed such assurance. All the said photographs, except those sold to the London and District Mutoscope Co., Ltd., were kept in the defendants' stock room, and had not been sold, published, exhibited, or offered for sale. The defendants further said that immediately they had an intimation of the plaintiff's copyright they informed him that they were quite willing to turn over any copies they might have in which a copyright was claimed, and that neither they nor the London and District Mutoscope Company had any desire to commit any infringement. They were assured by the publishers before the prints were bought that they were not subject to copyright, and they regretted having been misled. They offered to give any undertaking and to deliver up any infringing pictures. They had not made any profit by importing and selling the photographs, and they paid 10s. into Court, which they said was sufficient to satisfy the plaintiff's claim for damages. The jury returned a verdict for the plaintiff, with £3 damages. Judgment for the £3, an injunction, and an order to deliver up the infringing copies. Plaintiff to have his costs up to defence, but not after.—"The Times."

Patent News.

The following applications for Patents were made between November 25 and November 30, 1901:—

Magazine Cameras.—No. 23,850. "Improvements relating to the Magazine Backs of Photographic Cameras." William Aristides Verel and William Eyre.

Apparatus.—No. 23,851. "Improvements in Photographic Apparatus." Richard Schüttauf.

Shutters.—No. 23,903. "Improvements in or relating to Focal Plane and other Roller Blind Shutters for Photographic Purposes." Arthur Lewis Adams.

Films.—No. 24,025. "Improvements in and relating to Photographic Films." Klas Albert Pallin.

Indicators.—No. 24,035. "Improvements in Camera Indicators." Complete specification. (Communicated by A. W. McCurdy.) William Phillips Thompson.

Cameras.—No. 24,056. "Improvements in the Construction of Photographic Cameras." Charles George Barr.

Printing Frames.—No. 24,057. "Improvements in Photographic Printing Frames." (Communicated by Otto Berlebach.) Ernest Hackenberg.

Cameras.—No. 24,064. "Improvements in Roll-holding Photographic Cameras." Complete specification. Frederick Schmid.

Dark Slides.—No. 24,138. "Improvements in Photographic Dark Slides, and in means connected therewith, to facilitate changing the Sensitised Plates or Films." Charles Fielding Palmer, Stephen James Holliday, and William Adams Richards.

Dish.—No. 24,141. "A New or Improved Dish for developing Photographic Films." Complete specification. J. Boesch.

Sky Shade and Holder.—No. 24,190. "A Photographic Sky Shade and Holder." Edward Parnall Culverwell.

Developing and Fixing Apparatus.—No. 24,204. "An Automatic Apparatus for Developing and Fixing Photographic Plates." Complete specification. Jules Kukovitsch.

Stereoscopic Photography.—No. 24,255. "Improvements in Stereoscopic Photography." Louis Campbell Login.

Camera.—No. 24,350. "An Improved Camera." Magnus Niéll.

Print Washer.—No. 24,379. "Improvements in Apparatus for washing Photographic Prints and the like." George James Booth.

Cinematographs.—No. 24,413. "Improvements in Cinematographs." Complete specification. (Communicated by H. A. Boettner and S. Sacher.) Reginald Walter Barker.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
16.....	Camera Club	*The Marble Woman.* S. C. Kaines Smith.
16.....	Glasgow and West of Scotland .	*Photomicrography*, R. Garry; *The Manipulation of the Camera in the Field.* T. Wishart.
16.....	Oxford Camera Club	Members' Slides.
16.....	Southampton	Illustrated Lecture: *Résumé of Outings*, 1901. G. R. Johnson.
17.....	Birmingham Photo. Society ...	Demonstration: *Development of Negatives by the Use of Pyro Ammonia.* P. T. Deakin.
17.....	Plymouth	Lantern Night.
17.....	Stonehouse	Elementary Photography: *Exposures, &c.* G. T. Bayley.
17.....	Sutton	Lantern Slides.
17.....	Thornton Heath	Christmas Card Competition.
18.....	Borough Polytechnic	Lantern Night. Montuly Slide Competition.
18.....	Photographic Club	*Some Applications of Light Filters in Landscape Photography.* U. T. Harris.
18.....	Redhill and District	Lantern Night.
18.....	Southsea	Demonstration and Lecture by the Kodak Company.
19.....	Brentford	*Rapid Instantaneous Exposure and Development.* W. Kilbey.
19.....	Camera Club.....	*Synthol Developing Agent.* E. S. Barralet.
19.....	Darwen	*Toning of Prints, for Beginners.* J. W. Cooper.
19.....	Liverpool Amateur	*Microscopic Photography.* F. W. Saxby.
19.....	London and Provincial	Paper by E. T. Wright.
19.....	North-west London	*Sunny Memories of Normandy.* A. J. Reid.
19.....	Oldham	Prize Slides.
19.....	Richmond	*Lantern Slide Making.* T. A. Coysh.
19.....	Rodley, Farsley, and District...	Yorkshire Photographic Union Slides.
20.....	Borough Polytechnic	Instruction Evening: *Miscellaneous Hints and Formulæ.*
20.....	Croydon Microscopical	*English Gothic Architecture.* Mr. Mann, with Slides by T. A. Coysh.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

December 5,—Mr. J. S. Teape in the chair.

The Action of the Fixing Bath.

Mr. Alexander Mackie gave a short lecture on the above subject. It seemed to be required, for the reason that the majority of photographers appeared to look upon the operation of fixing as one of such extreme simplicity in practice that it was not at all necessary to have a special knowledge to carry out the process with success. They thought that if at any time necessity arose to investigate the precise action of the fixing operation, they had only to turn to one or other of the text-books to find a complete description of the matter. This was the lecturer's own impression until a few months ago, when, noticing something that did not coincide with his previous ideas on the subject, he referred to the photographic text-books to see what they had to say concerning the process of fixing. In most cases the description was inexplicit and inexact, and in some instances full of discrepancies, but in no case could he find a description that he could reconcile with his ideas of the action of fixing. What he had to relate was his deductions from his readings, and these deductions were amply confirmed by other authorities consulted. The action of fixing was usually spoken of as that of dissolving a silver salt in a solution of hypo. Dissolving in such a sense was not the proper term. It would be correct to speak of dissolving sugar or hypo in water; there the change was not a chemical one, but a molecular change, and by evaporating the water one could reconstitute the solid. The action of the fixing bath, on the other hand, was a chemical decomposition, or rather a series of decompositions, of a very complex character. An index to the decomposition that takes place is seen in the process of making gelatine emulsion. Here we have potassium bromide added to silver nitrate; a decomposition takes place, and the bromide leaves the potassium and joins the silver, while the nitric acid radicle of the silver nitrate joins the potassium and forms nitrate of potash. Another instance may be given in the action that proceeds when a negative is placed in bichloride of mercury. The mercury salt acts upon the silver of the negative, and produces a double chloride of silver and mercury in one compound. These double salts have a special interest from a chemical point of view, as they have peculiar properties. For instance, silver chloride darkens under the action of light, but, in combination with mercury, it does not. Mr. Mackie asked the meeting to assume that the fixing bath, in the first place, contained just half the number of atoms of hypo that there were of bromide of silver in the plate. That being the case, the following equation represents the action that goes on:—

$$\underset{\text{Silver bromide.}}{2AgBr} + \underset{\text{Hyposulphite of soda.}}{Na_2S_2O_3} = \underset{\text{Sodium bromide.}}{2NaBr} + \underset{\text{Silver hyposulphite.}}{Ag_2S_2O_3}$$

Such a bath would be rightly described as containing insufficient hypo. The hyposulphite of silver that was produced was an unstable salt, and liable to spontaneous decomposition in time. Supposing, however, that the atoms of silver bromide in the plate equal the number of atoms of hyposulphite of soda in the fixing bath, then the action is expressed by the following equation:—

$$2AgBr+2(Na_2S_2O_3)=2NaBr+Ag_2Na_2(S_2O_3)_2$$

One obtains a double hyposulphite of silver and sodium, which, again, is not a stable substance. On the other hand, if one takes care that the fixing bath shall contain still more hypo, say, three atoms to every two of silver bromide in the plate, one gets the same decomposition, except that a further addition of sodium to the double salt takes place, and this double salt may be easily washed out. The equation is as follows:—

$$2AgBr+3(Na_2S_2O_3)=2NaBr+Ag_2Na_4(S_2O_3)_3$$

The lecturer took some silver nitrate solution, and in another vessel some hypo solution, placing in other vessels the larger portion of the silver solution, and the larger portion of the hypo. He placed the small quantity of hypo in the large quantity of silver, and the large quantity of hypo in the small quantity of silver. In the first case a white precipitate was formed, which would soon turn black. The action was analogous to that when a plate was fixed with insufficient hypo; but in the second case the white precipitate first formed immediately redissolved, and was comparable with the condition of things when an excess of hypo, as should always be the case, was used. In the first experiment the hyposulphite of silver first formed combined with the water-producing sulphide of silver and sulphuric acid, as expressed in the following equation:—

$Ag_2S_2O_3$	+	H_2O	=	Ag_2S	+	H_2SO_4
Hyposulphate of silver.		Water.		Silver sulphide.		Sulphuric acid.

Such was also the action when a plate was fixed with an insufficient quantity of hypo, and, needless to say, the sulphuric acid was by no means a desirable thing in a plate. The experiment No. 2 represented the action when a plate was properly fixed, although the operation was slowed by the mechanical obstruction to the blending of the two things in the film. Even when the silver bromide had been decomposed, one could see the silver hyposulphite, which had much the same appearance. The next action, in the presence of an excess of hypo, was the formation of the double salt of silver and sodium, which was soluble in water to a certain extent, but a bad thing to leave in the film, owing to its unstable nature. But with plenty of hypo, there still remained the third action—that of the formation of the soluble double hyposulphite of silver and sodium, which could be easily removed from the film. In practice, therefore, one must determine the time required for these actions, so that the plate may be left in a safe condition. One had a guide already to hand in the time of the disappearance of the white silver bromide from the back of the plate. Although this did not determine the time in which complete solution of the silver bromide and its subsequent forms took place, sufficient data was afforded for the estimation of the time it was well to allow to elapse for the complete action. It was a safe rule to leave the plate in the fixing bath for as long again as the time required for the disappearance of the white bromide. In the case of paper prints, this guide was not available, but it was safe to assume that, as the film of silver was much less than the gelatine film in the plate, it would not take longer to fix properly. With reference to the action of the hyposulphite in solution upon the silver image, it was quite safe to leave a plate in the fixing bath for a reasonable time. After ten days he found that no apparent action on the image had taken place in a plate left all that time in the bath. It was thus fair to assume that a few hours more or less did no damage. As regards the strength of the bath, he had little to say. A weak solution of hypo had been found to fix a plate more quickly than a strong one, but these were vague terms. With a saturated solution, however, the action would be slow, and with a very weak solution the action would also be slow, so it seemed logical to choose the happy medium. Although hypo did not act on the silver image when the plate was thoroughly covered with solution, the case was very different if air were allowed access to it, such as would be the case if a negative were removed from the hypo and placed unwashed to dry. The image would soon be affected, so that it was wise to wash the plate immediately on its removal from the fixing bath.

Croydon Camera Club.—A discussion was arranged at the meeting on Wednesday, 4th inst., upon the photography of snow, frost, and ice. Mr. Ben E. Edwards opened the debate, stating that with snow scenes the crux was in obtaining a precise exposure. Partial reversal is likely to ensue with over-exposure. Slightly under rather than full development should be adopted. Extremes of contrast were what had to be avoided. Mr. Isaac considered snow scenes easier than ordinary landscape, as there were fewer colours to translate into monochrome. He advocated quick development, and that extreme shadow detail should be neglected, and did not think an isochromate plate and a colour screen were called for. Mr. Harper was in favour of full exposures. Mr. Salt considered that a moderate screen is ineffective, one requiring an exposure of five times normal being advised. Mr. Hector Maclean opined that an isochromatic plate and a screen, or filter, such as the absolutus, were necessary for snow effects, if taken under the most striking aspects. Many of them remembered the delightful renderings of snow scenery by Mr. Farquharson at the last few R.A. Exhibitions. These depend for their effectiveness upon a flood of yellow orange sunlight, casting purple-blue shadows. To photograph such an effect the screen and colour-sensitive plate were obviously the proper means. Exposure is theoretically shortened by the reflection of the sky lighting from the snow mantle. He had it from one of their members, Mr. Dapples, that, using a medium rapidity plate in the Swiss Alps last summer he obtained a slightly over-exposed plate of a mountain scene with aperture f-64 and 1-100 second exposure. Mr. Maclean recommended longer exposure than the calculated average for English snow scenes, followed by shortened development, and finished off with intensification. Hoar frost required different treatment to snow scenes. In the former nearly the whole range of the printing scale could be given to the hoar frost itself, in the latter some portion must be devoted to the tones of those parts of the landscape which were not snow-covered. With hoar frost a shortened exposure should be the rule. Messrs. Rogers, Hicks, Hawkins, and others continued the debate. Mr. Kough was glad to be able to give practical evidence of the value of screens and isochromatic plates, and also bear witness that as regards hoar frost the exposure should be a brief one. He handed round a number of negatives bearing on his contentions which bore them out, the best being one on a Thomas isochromatic plate exposed behind an absolutus filter.

West London Photographic Society.—Dec. 6.—Mr. C. O. Murray, a member of the Society of Painter-Etchers, gave a lecture on "Composition," which proved one of the most interesting and instructive the Society has ever had. Turner's "Norham Castle" and Constable's "Haywain" were taken as the basis of the lecture, and the construction of these two pictures was shown, stage by stage, before the members by means of sketches in charcoal, the massing of the lights and shadows and other points in the composition being lucidly explained as the drawings proceeded. Next meeting, December 20, members' lantern night.

Liverpool Amateur Photographic Association.—At the last weekly meeting Mr. Fred Anyon gave a practical demonstration of bromide printing, using first one of the new slow contact papers, and then the ordinary rapid paper with a developer comprised of dianol, sulphite of soda, and bromide. He produced several exceedingly fine prints, which were much admired. Mr. Anyon showed a method of clearing prints by means of iodine, by which many over-exposed and foggy bromide prints may be saved; and a method of uranium toning which, in his hands, produced a beautiful rich brown on a bromide print.

FORTHCOMING EXHIBITIONS.

1901.	
Dec. 20–Mar. 1902 ...	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.
„ 24–Jan. 4, 1902	Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.
1902.	
February 13–15	Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries: W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell Hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.
„ 15–Mar. 8	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
„ 19–26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THERMOPHORS.

To the EDITORS.

GENTLEMEN,—May I suggest that the German thermophors for warming developers, etc., to which you allude on page 770, probably only contain a supersaturated solution of sodium acetate, and consequently might easily be prepared by any photographer.—I am, yours, &c.,

J. DORMER.

December 7, 1901.

THE GLASGOW SOUTHERN PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—I will be glad if you will kindly allow me sufficient space to inform your readers that entries for the six open classes in this Exhibition will remain open till Monday, December 16 (last post), provided the exhibits are forwarded by the 18th of 19th. Thanking you in advance,—I am, yours, &c.,

JOHN B. HAGGART, Hon. Secretary.

93, Norfolk-street, Glasgow, December 7, 1901.

THE MEASUREMENT OF LIGHT.

To the EDITORS.

GENTLEMEN,—Mr. Steadman's article on the above subject in your issue of the 6th inst. has induced me to turn up his original article, and Mr. Webster's reply. I trust the latter gentleman will excuse any breach of controversial etiquette if I make a few remarks upon the matter, for one or two of the paradoxes will bear a little further attention.

Mr. Steadman said on September 27, "If a cylinder 4 cm. long and 10 cm. in diameter have one end removed, that end will admit to a point at the centre of the other end light from 3-16ths of all surrounding space." There is a curious fallacy here. Let the sides of the cylinder be at right angles to the horizon, and the end, consequently, horizontal. The point will then receive light from the sky, which, for convenience, we may regard as a plane parallel to the horizon at an immense distance, at least 93 million miles (the sun's distance). The light from a circular patch of this sky-line falls upon the point in the cylinder end, and a line passing through the centre of the circular patch and the point will be parallel with the sides of the cylinder. Now, the dimensions of the circular patch can never be expressed as 3-16ths, or any other fraction of all space, for the dimensions of space are unknown. And, since this fraction is impossible, the rest of Mr. Steadman's paradox falls to the ground.

Turning to the article on December 6, he conveys the impression that he does not grasp the function of a standard of illumination. Dr. Stine is evidently describing a method of obtaining such a standard, to which illuminations of various degrees of intensity may be referred. Mr. Steadman's objection that the author has not supplied a method of measuring the extent of all sources of light which illumine an object is on a par with a complaint that when the gramme was invented no method of measuring the size of the moon was included. All sources of light may be compared with, and expressed as fractions of, a standard of illumination without respect to their individual distances and extent, if these be measurable. It is only when the intensity of the illuminant itself is to be measured that its distance and extent become of importance.

With regard to the reiteration that a plane surface can be uniformly illuminated by a point of light, and that this normally occurs, one can only suppose that Mr. Steadman has never, for instance, placed a candle on the floor in the middle of a room and measured the distance from the flame to a point on the wall of equal height, and then measured again from the flame to the point where the wall meets the ceiling vertically over the first mark. For if this hypothenuse is not longer than the lower line, Euclid will need revision. But if the hypothenuse be longer, Mr. Steadman will hardly maintain that the wall is uniformly illuminated.

It would occupy too much space to go further into details. But another remark, concerning that "ignorance of light," which is the cause of the loss of the great majority of plates, may be touched upon. It would seem rather that a contempt for actinometers has something to do with the question. A man may be profoundly acquainted with light, and yet misjudge its actinicity, since he has no natural spectroscopic faculty to inform him thereon. And as to the relative intensities of light at different times, experimental psychologists are well aware of the unreliability of the evidence of the unaided eye. No amount of knowledge can enable the naked eye by itself to infallibly gauge the varying intensities and actinism of light under diverse conditions, hence there is no immediate prospect of any "simple unit" which can be used like the multiplication table.

The general tenor of these two articles is that photologists employ undue complexity, dogmatism and, at times, error, in their phraseology. Of the "error" Mr. Webster has already spoken; and, concerning the dogmatism, no physicist nowadays would assist in the promulgation of a dogma which hypothecated, however remotely, that Nature was wrong because in disagreement with theory. The idea of such a possibility is, as Mr. Steadman says, diverting. And, finally, as regards undue complexity in describing the wonderful complexity of Nature, this is at least not a very common fault in science. It is true there are many people who deplore the prevalence of those portmanteau-words which are made to enclose a whole phenomenon in a few syllables. But after all, precision is the godmother of science and economy of language its best apostle. Apologising for the length of this letter,—I am, yours, &c., J. DORMER.

December 7, 1901.

THE FOCUS OF LENSES.

To the EDITORS.

GENTLEMEN,—Can you enlighten me upon the following points:—For finding the equivalent focus of double lenses, various authorities give different methods, all of them more or less complicated, and all require a number of trials, the mean to be taken as the correct focal length.

The simplest method of all, viz., focussing a piece of black paper on a white ground, so as to obtain on the focussing screen an image of exactly the same size, measuring the distance from the copying easel to the focussing screen, and dividing the result by four, gives the exact focal length of the lens. This I have proved by trials with lenses by Dallmeyer, Ross, etc., and get the exact distance as marked on the lens by the maker. Again, take any table of conjugates for copying same size, all give the same (say, with 6 inch lens, 12.12). But we are always told that the method of finding the equivalent focus is not correct, and what I am asking you to do is to kindly say why it is not correct, and why is the method ignored by scientific writers?—I am yours, &c., W. T. WILKINSON.

[The method is not absolutely correct, as has been pointed out frequently, though it is near enough for practical purposes with most lenses.—EDS. *B.J.P.*]

THE MORGAN ELECTRIC LIGHT.

To the EDITORS.

GENTLEMEN,—We should be glad if you will kindly announce to all your readers that we shall be giving a demonstration of the Morgan electric light on Tuesday, December 17, from 5 to 7 p.m., when we shall be pleased to see any of your readers and explain the system thoroughly.—I am, yours, &c., O. SICHEL AND CO.

52, Bunhill-row, London, E.C., December 6, 1901.

THE NEW KODAK POLICY.

To the EDITORS.

GENTLEMEN,—Kodak, Ltd., has a peculiarly British characteristic, although it is to be absorbed into an American entity, and that is it does not acknowledge defeat. The opposition which was evoked by the imposition of certain conditions of sale was strong enough to give pause to the company, and cause it to "mark time." This having gone on long enough, diplomacy comes in, and a deftly conceived manœuvre has begun. While Kodak, Ltd., has a proposed change to make in its dealings with its customers, involving the abandonment of the anathematised "condition of sale," it states that this condition was quite misunderstood. Of course; but is it not a little curious that so many were of the same frame of mind? It was intended, it appears, as an arrangement for mutual benefit. This month's "Trade Circular" says, "As we are desirous of putting our discounts and conditions of sale on a footing which shall give everybody all round what they want, we propose to abandon the condition, and shape our terms in such form that, whilst offering an inducement to those dealers who give the preference to our goods, there will be no danger of any customer misreading the regulations as in the nature of a threat or coercion." This is a very cleverly drawn statement, which, if it does not contain the elements referred to, does seem, in connection with what follows, to be but a kid-glove distinction. There is to be a special consideration for those who sell only the rollable film goods of the company, which is, perhaps, a fair way of attracting custom. But the retail man will not in future be able to buy his Kodak goods except from Kodak, Ltd., which will, from the first of January, sell for resale by retail only. The company announces that "We dispense with the wholesalers." The matter has been well considered apparently, and this is the bid—"All goods, any amount, carriage free," which will ensure that the retailer and his customers will benefit by the change, so says the company. No matter whether the condition is withdrawn, the idea still remains, monopoly for Kodak, Ltd. The company wishes to get the market, and to shut out all other rollable films. As no camera-maker can dictate what plates shall be used with his camera, so Kodak, Ltd., surely will not be able to control matters that photographers will take Kodak films only. If these films are the best, and the cheapest, then customers will have them, and dealers will stock them; but, if they are not, and if other makers produce a film equally good, or better, and cheaper, then the public will find it out and use them. The dealer will have to keep what he can most readily sell. It will be a question of who can give the best discounts, and who produce the best quality, and in this matter the field is still open. Kodak, Ltd., hopes to get and keep the whole photographic world, but the day is not yet surely. The company is entitled to all the praise its enterprise calls forth, and it has done well for the public. No depreciation of its enterprise is necessary. But in the British Isles a monopoly of this sort does not seem likely to be worth much. I hope Kodak, Ltd., will go on its way fighting with a fair and square face, and then what it wins it wins with honour and credit.—I am, yours, &c., ANTI-MONOPOLY.

December 9, 1901.

[If our correspondent read his JOURNAL a little more closely he would have seen that Mr. George Eastman has disclaimed any intention on the part of his company to attempt the establishment of a monopoly.—EDS. *B.J.P.*]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

W. M. Stuart, 7, South Bridge, Cupar, Fife. *Photograph of Rev. J. Duncan.*

E. Gael, 77, Whiteladies'-road, Clifton, Bristol. *Four photographs of Gough's Caves, Cheddar.*

W. E. J. Church, 119, High-street W., Sunderland. *Two photographs of Sunderland Amateur Football Team.*

H. CALLUM.—"Wilson's Photographic Magazine," published at Broadway, New York.

LIGHTLINE.—We have no further information. The address can be obtained by reference to Kelly's London Directory.

J. JACKSON.—The only thing we can suggest is that you obtain some practical tuition in the work you and your son desire to follow. If you consult our advertisement columns you will see the addresses of those who enlarge and colour photographs.

BOOK ON GUM-BICHROMATE, &C.—"W. P." writes: "(1) Will you kindly inform me where I can obtain a book of instruction on the gum-bichromate process? (2) Also, can you give me the address of the Brothers Pemberton, background painters?"—In reply (1) The gum-bichromate process by the late Mr. W. J. Warren, published by Iliffe and Son. (2) We do not know the address of the firm.

GUMMING AND PERFORATING MACHINE.—A. E. O. writes: "Will you please tell me who are the makers of, or where I can purchase, a machine for gumming and perforating photos like postage stamps? I have tried two or three London firms without success."—In reply: We should think that Messrs. Fallowfield or Messrs. Houghton and Son will supply the necessary appliances. If not, perhaps Messrs. Seaman and Sons would do so.

D. MCARTHUR.—(1, 2, 3) If you refer to the Lantern Supplement to the JOURNAL of September 6 you will find several formulæ for flashlight compositions. (4) The cause of the stain is that the negative was not thoroughly washed between the operations of intensifying. We doubt if the stain can now be removed. You might try again, treating the negative with bichloride of mercury. (5) A lens of about four inches focus. (6) We should advise you to consult an oculist.

SPOTS ON PRINTS.—F. WELLS writes: "Herewith please find four cabinets which are discoloured, and one not. I should receive it as a great favour if you could describe the cause. I am afraid the mounts are in fault."—In reply: The cause is very simple to describe. The prints are insufficiently fixed. They were, apparently, allowed to stick together while in the hyposulphite solution; or that was too weak for the time they were immersed in it. Hence the yellow stain.

COPYRIGHT.—A. ROBINSON writes: "The print I sent you to register is now published (without my consent) in the "Implement and Machinery Review," December 2. How can I claim against them? Copyright is not stamped on the photos which I am selling. I should esteem it a great kindness if you would let me know what to do."—In reply: You can sue the paper for both penalties and damages, and will recover. Place the matter in the hands of a solicitor without delay. The fact that the photograph is not marked "copyright" makes no difference.

VARNISHING A PAPIER MACHE DISH.—"ENAMEL" writes: "I have a large papier-maché dish from which all the varnish has worn away. Can you inform me of any solution sold for the purpose that I could revarnish or enamel myself, or would it require to be stoved at a high temperature?"—In reply: The only way to effectually repair the vessel is to have it rejapanned and stoved. To have this done will probably cost as much, or more, than a new dish. You might make it serviceable for a time by coating it with "Aspinal's Enamel" or similar material.

THE CARBON PROCESS.—T. M. LONE writes: "Would you be so kind as to inform me how I can practically make a carbon transparency to answer for a contact without the subject being reversed? Is there any method of stripping it from the glass? Of course, I know the copying can be done in the camera, but I think that way it lacks definition."—In reply: Yes; first clean a glass plate, and then treat it with French chalk. Coat the plate with a thick enamel collodion, and when that has thoroughly set place in cold water until all the solvents of the collodion are washed away. Squeegee the exposed tissue upon it, and develop in the ordinary way. When the transparency is dry it may be stripped from the glass. It is a good plan, after the picture is developed and drained, to place it on a levelling stand, and pour on a solution of gelatine, and allow that to dry before stripping. In this way the film transparency will be more convenient to handle. The carbon process is too slow for copying in the camera.

DISPUTE WITH A SITTER.—H. MOONEY writes: "A few weeks ago three young men came to sit for their photographs. One of them was a soldier, and has since gone to Africa. One of them came the following week, and I told him that he had moved his head, and would have to sit again. He said they would not sit again. They had it taken specially for the soldier. He now says that he must have the deposit money back, or he will put it in a lawyer's hands. Am I forced to give him it back?"—In reply: We should say that you should return the deposit money, as you did not secure a good portrait at the time of the sitting, and it would be now too late for the purpose required.

COLOUR PHOTOGRAPHY.—F. N. G. writes: "(1) Can you put me on the track of any information with reference to the latest advances made in the direction of colour photography? I wish to use it in connection with a lecture on photography. (2) I attended a lecture some years ago on photography where three-colour printing was described and examples shown, also natural colour pictures thrown on screen with the aid of three positives and three-colour screens placed one behind the other in lantern. Do you think I could borrow this outfit for my own use?"—In reply: Write to Messrs. Cadett and Neall, and also to Messrs. Sanger Shepherd and Co. for their pamphlets on the subject. (2) We doubt if you can borrow the apparatus. We should, however, advise you to communicate with those who gave the lecture referred to.

COPYRIGHT.—"LONGTON" writes: "Some twelve months ago I received a whole-plate photograph from a lady of her deceased husband to be copied to cabinet. Proof was sent, but was returned not approved of, although thought by many to be far superior to the original. The original photo was taken by an amateur, and is not copyright. Some few weeks ago I received an order for four cabinets from four of the photo which I copied from the whole-plate to four of his personal friends. I am now threatened with legal proceedings from the widow. Am I liable?"—In reply: Under the circumstances, unless the original picture was copyright, and as you were not, presumably, paid for the copy you did, we are inclined to think that proceedings cannot successfully be taken against you, but it is rather a knotty point to give a definite opinion upon.

TONING FORMULA.—J. M. writes: "(1) I have just got on trial a quantity of gelatino-chloride P.O.P., and the toning baths recommended are as follows: (a) 54 oz. water, 2½ drachms sulpho-cyanide of ammonium, 1½ drachms of aluminium (pure), 12 grains of sulphite of soda (crystals). (b) Toning Bath for Brown Tones: 54 oz. water, 2½ drachms sulpho-cyanide of ammonium, 2½ drachms of washing soda. A note is made to the effect that if chloride of aluminium cannot be obtained, the toning may be done without it. Please give your opinion as to the permanency of prints toned by this process, as it will be noticed that no gold is used? (2) Does 1 per cent. chloride of gold mean 1 grain to the ounce of water?"—In reply: (1) We are not familiar with the toning baths quoted, nor with a paper with which it is given. If the prints tone in the bath it is clear that they will not be toned with gold. We can give no opinion as to the permanency of the picture. (2) One per cent. chloride of gold means one part of the chloride in one hundred parts of water.

STUDIO QUERIES.—"COMBINATION" writes: "(1) Would a studio with an aspect very nearly due west be difficult to work? (2) Would you place the sitters at S. or N. end? (3) The width of studio will be about 11 to 12 feet. How high should it be? (4) Would you advise a lean-to shape? It appears to me ridge-shape would be best, so as to exclude sun as much as possible. (5) If you advise ridge, should not the ridge come nearer to side light? Or would a centre ridge be best, having regard to the general all-round character of work to be done? (6) Is a combined toning and fixing bath, having no alum or lead, a safe bath to use?"—In reply: (1) No. (2) As a rule at the south end. (3) From 13 to 14 feet to the ridge. (4) We should prefer the ridge roof, if the east is unobstructed, as then you would be able to work with either light—say, the west in the earlier portion of the day, and the east in the after part. (5) Centre ridge if the studio be constructed as suggested. (6) Yes, fairly so, if the bath contains a sufficiency of gold. But the difficulty is to know when it is exhausted, as the bath will continue to tone after all the gold has been used up. It is for this reason that separate toning and fixing is to be preferred.

EXHIBITING PHOTOGRAPHS.—J. B. writes: "Will you kindly inform me the rights of the undermentioned? I took a photograph of a young lady (C.D.V. size). Being a good subject, I enlarged it, thinking it would make a fair specimen. I mentioned to the party I was doing it, and no objection seemed to be raised. The lady saw it, but did not purchase. I put in in my window. It had scarcely been there half an hour when I received a letter to say she forbid me to exhibit it in any way. I agreed to remove it from my window. Am I bound by law not to hang it up in my studio or reception room? Is not a photographer entitled to enlarge a negative if he felt disposed to do so, nothing being mentioned at the time of sitting that they did not wish it exhibited? I should feel obliged if you would give me a little advice on this matter, as it seems the lady wishes it put out of sight altogether. It is simply an ordinary bromide enlargement of a girl about sixteen. Only reason for enlarging was her hair was of exceptional length."—In reply: Certainly, the photographer has no legal right to exhibit an enlargement from the negative of a sitter, or even to make one without consent. The lady can obtain an injunction in the Chancery Division of the High Court of Justice to restrain its exhibition. Did you not read the article on the subject in our last issue?

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

What Some Readers Think of the Book.

"A valuable present."

"I congratulate you on the Almanac. It is the best you have done."

"I have found more items of interest to index from it than in the case of any previous issue."

"I think it is a splendid compilation, or rather, achievement and compilation, for the original matter you have put in means a lot of work; indeed, the labour you have put in must be immense, and you are to be congratulated."

"I congratulate you on the good judgment you have displayed in compiling your comprehensive article on Tele-photography, and also the very valuable collection in the Epitome of Progress."

"Having somewhat recently taken up Tele-photography, you may be sure I was pleased to see your masterly résumé on the subject, which I have perused with the greatest pleasure. No need now to wander further afield for information, except, indeed, it be to Mr. Dallmeyer's treatise, which would be invaluable to a more advanced worker than myself."

*** The 1898, 1899, and 1900 editions of the Almanac (20,500 copies each) were sold out within a few months of publication.

*** The 1901 edition was disposed of in less than a fortnight.

*** The entire 1902 edition has already been sold right out, and no further orders can be executed.

EX CATHEDRÂ.

The Right to Use Portraits. It is a somewhat singular coincidence that at about the same time that the question of a right of a photographer to exhibit portraits of sitters was engaging the attention of the Law Courts in England and Scotland, the same question was raised in those of America. From a report which we gave last week, it will be seen that when the case—which was that of making use of a lady's portrait as an advertisement without her consent—was called in the Supreme Court, a demurrer was entered. The Court held that there was a sufficient cause for action, and from this ruling the defendants appealed. In the end the Court decided in the lady's favour, holding that the use of her portrait was unwarrantable. The lady will now prosecute her suit in the Supreme Court to collect damages. These she puts down at fifteen thousand dollars. In the two cases tried in the Court of Chancery here no special damages were claimed, only injunctions. It is now established in America that it is illegal to make use of customers' portraits without their consent, though we believe for the first time there.

* * *

Transparency to Röntgen Rays. In the early days of Röntgen ray work, and, indeed, until quite lately, our knowledge of the transparency or opacity of a body to these rays was purely empirical; certain bodies allowed them to pass

with greater or less ease, others arrested them entirely or nearly so. But the author, M. L. Benoist, of a paper in the "Journal de Physique" last month, has put the matter on an entirely new footing, for he states that the general laws of transparency of different kinds of matter for Röntgen rays of different kinds can be reduced to simple forms, a discovery which is not paralleled by any similar knowledge with regard to other forms of radiation. M. Benoist finds that the transparency depends only upon the absolute and atomic weights; accordingly, these data being ascertained, we should be able to predicate the extent of the transparency of any body, however complex, for any particular kind of Röntgen ray. As is well known, there are many varieties of these rays, and the converse of the above may be applied for the purpose of classifying the rays themselves.

* * *

Saturating the Silver Bath with Iodide. The old plan to bring this about was to coat a plate with collodion and leave it for twenty-four hours in the bath. A better plan when making a new bath is to dissolve the silver in one-fourth the ultimate quantity of distilled water used, to saturate this with iodide of silver, and then to add the rest of the water and filter. There is thus obtained an absolutely saturated solution, usually slightly opalescent through the filter paper failing to act perfectly. The final addition of the plain strong silver solution at once cleared this opalescence, and gave a solution almost saturated with iodide. A hint in practice may be here given. It will be necessary to be very careful to shake the bottle of bath vigorously after adding the strong silver solution, for we have known of instances where, in making a bath in this manner, failure has resulted through a layer of strong solution remaining at the bottom of the Winchester in which it was made, although this had turned upside down twice over. The specific gravity of strong silver solution is very high, and, as a consequence, the liquid strong in silver has a tendency to remain at the bottom of the bottle when the mixing by shaking has been of a perfunctory character.

* * *

The Preservation of the View from Richmond Hill. It is very desirable that the magnificent view from Richmond Hill, so well known to most photographers, should be preserved as it is; and the London County Council are to be commended in their action to do so by the purchase of the Marble Hill Estate for something like £72,000. The London County Council, the Surrey County Council, and the Twickenham District Council have made liberal contributions with this object, and it was hoped that the Middlesex County Council would supply the rest of the money. The Chairman of that body, however, takes a different view on the subject, and looks upon it in a purely business light. His opinion is that, with the heavy burdens of road-widening and maintenance, rebuilding of Kew Bridge, and increased School Board and other charges, the Middlesex County Council should not be called upon for any contribution. He feels that, as the view is from another county over Middlesex, and the other county will reap all the advantage in increase of their rateable value, the former county will be deprived of a large and increasing rateable value, as the land, if turned into an open space, will not be rateable, which it would otherwise be. Hence his objection to the suggested contribution. Whoever has to find the necessary money, it is to be hoped that the view from Richmond Hill, the most beautiful one in the neighbourhood of London, will be preserved as it is at present, and for all time.

* * *

Solubility of Oxide of Silver. According to Bineau, whose dictum is generally quoted as authoritative, oxide of silver is soluble in water to the extent of one part in three thousand, which, roughly speaking, is about three grains to the pint. M. J. Levi has been experimenting in this direction, and he states that this proportion is erroneous, the true extent being one part in 15,360. These facts have an interesting bearing upon a rarely quoted point of practice in wet collodion work elucidated about forty years ago by the late R. W. Thomas. In making a normal nitrate of silver bath for wet collodion, he recommended, after saturation with iodide of silver, the addition of oxide of silver to neutralise the trace of nitric acid usually to be detected, even in re-crystallised nitrate of silver. Experiment, however, proved that this led to what, for want of a better term, might be called "over-neutralisation," the resulting liquid having an alkaline reaction. He attributed this effect to the slight solubility of silver oxide in solution of nitrate of silver, and to obtain an absolutely neutral, or normal, as he termed it, bath, he advised the addition of a small quantity of nitric acid. Writing from memory, we believe it was two drops to a Winchester quart. It would, however, seem probable, in the light of the facts above quoted, that the silver salt was not a factor at all, and the oxide was dissolved by the mere action of the water. Whatever the true theory, there is no doubt that in practice for wet collodion work, and to have absolute certainty as to the composition and the condition of the chemicals employed, Mr. Thomas's plan is about as near perfection as possible.

* * *

The Manufacture of Collodio-chloride Paper and Insurance Companies. More than once we have commented on the fact that, although the collodio-chloride process was of British invention, most of the paper used in the United Kingdom is supplied from Germany, and always has been. On three or four occasions we have, in conversation with the principals of some of the largest and most enterprising firms of gelatine paper makers in this country, referred to this circumstance, and the reply, in each instance, in effect, has been the same. "If we were to commence the manufacture of this paper we could not do it on our present premises on account of the fire insurance companies, and the increased premiums we should have to pay on the whole of them, even on those where the paper was not actually made, would be a very serious, if not a prohibitive item. The only way we could manufacture the paper would be by erecting a building for the manufacture quite away from all existing ones, and isolated from them, and then it would be a question if they would insure it, except at a prohibitive rate." Of course, where there are large quantities of ether and alcohol used there is always a risk of fires or explosions; but these are reduced to a minimum if ordinary care is used, which would naturally be done for personal safety, if not for anything else. But insurance companies do not, or will not, take cognisance of the fact in arranging their premiums. Hence the collodio-

chloride paper manufacture, for the most part, remains in the hands of the Germans, and, so far as can be seen, they are likely to hold it until it is wrested from them by increased enterprise.

* * *

Gaudy Carbon Pictures. With the spread of the carbon process, we have the manufacturers of the materials for its working, both at home and abroad, competing in the number of coloured tissues they supply. Those who visited the late annual Exhibition of the Royal were no doubt struck with some of the pictures shown in the trade section, and their extravagant, not to say incongruous, colours for the subjects shown. A bright crimson, to look at for long, is really very painful to some; yet we have seen enlarged portraits by the "carbon" process in this colour, though we should be sorry to have any of them on our walls on account of the painful effect it would have on our eyes. But, there, all eyes are not alike. We know that the ruby light in the dark room has a painful effect on some people, producing headache and other inconveniences if worked in continuously; yet others experience no inconvenience whatever from it. There may be a novelty in some of these gaudy colours, which are not obtainable in any but the carbon process, and some photographers may use them as an attraction to their showcases, but we doubt if they will generally commend themselves to a clientèle with refined taste. The carbon process is a permanent one, but only so long as the pigment of which the image is composed is permanent. Carbon is; yet some of the pigments at times added to it to modify the black are not; and then if they fade with long exposure to light the carbon image still remains. But with some of the colours we have seen carbon must be conspicuous by its absence, and if the pigments used are of a fleeting nature the "carbon process" can no longer be classed as one of permanency. Perhaps, however, the pigments used for these gaudy colours are permanent.

* * *

Winter Inconveniences. The stormy weather and blizzards experienced in different parts of the country last week, and the short spell of severe weather a few weeks back, sufficiently indicate, without reference to the almanac, that the winter season is at hand. Probably in no businesses does severe weather bring greater inconveniences than it does to photographers. One of the greatest, perhaps, is a frozen water supply, which, in many cases, had some few timely precautions been taken might often be avoided; but in too many instances they are neglected till the trouble is incurred. Those who remember the inconveniences they experienced a few years ago, when they were frozen out of water for several weeks, and had to depend upon water fetched from the stand-pipes that had to be put up in the streets for perhaps only a couple of hours at a time, are not likely to forget them, and they will doubtless remember how easily some of them might have been obviated. But one must ask whether they have yet taken the necessary precautions to avoid similar ones if a spell of similar weather were to set in suddenly this winter? It is quite true that no special precautions against frost have been necessary during the past three or four winters. But there is no telling, in this uncertain climate of ours, what we may be experiencing even at the time this appears in print. After a few days of cold weather, when the water will get very cold, one severe night may freeze the supply pipes, which, possibly, will remain, as they did in the memorable frost of a few years ago, frozen for some six or seven weeks. It is for this reason that we call attention to the subject just now as a reminder. All exposed pipes should be without delay given some protection. At most ironmongers' a special felt is sold for the protection of water pipes, and if two or three thicknesses of this be wound round the pipes, it being such a bad conductor of heat, they will rarely be frozen, more particularly if the taps are left dribbling during the night. Of course, the water company need not be informed of that; then they will make no complaint. Supposing it should turn out that we get no hard weather at all, the precaution to guard against its effects involves but little trouble, and that is well expended, even if it proves unnecessary. If the service pipe happens to be, as many are, laid near the surface of the ground, it should also receive further protection; a good one is a few inches of stable manure laid above it, or some more earth heaped upon it.

* * *

Winter Portraiture. Apropos of the inconveniences that winter brings to photographers, there is another, namely, a general stagnation of the portrait business. This, however, is not the case everywhere. In some countries it rather gives a fillip to it than otherwise. In America, Canada, and Russia, where the winters are severe and long, portraitists make a feature of portraits taken under wintry aspects in the studio—snow-clad scenic backgrounds, outdoor accessories with snow upon them, and sometimes with snow on the sitters, or falling about them, etc. In this country we seldom see portraits in this style, probably for the reason that we seldom have a winter of long duration, and therefore few make a speciality of this class of portraiture. Still there would be a novelty, and probably a profitable one too, should we have a long spell of winter such as we had a few years ago. Anyhow, it would be an attractive novelty for the showcase to have a few specimens of this class, considering that their production involves but little or no outlay, and it does not necessitate a winter to produce them. They may as well be taken at mid-summer as at mid-winter if the model can be induced to don winter attire for the occasion. Some cotton-wool, or better still, common sheet wadding, laid on outdoor accessories will convey a very good idea of a layer of snow upon them. Sheets of wadding laid on the floor will also give the effect of snow on the ground. As for a background, any outdoor scene may be utilised if a little whitewash be applied roughly just above where snow, it might be imagined, would settle if the scene were real, instead of a painted one. If the background were one in flatted oil the whitewash could be washed off, and the background would be none the worse for the treatment; of course, with a distemper one, this would not be the case. In some of the winter portraits we have seen from Canada and the States snow has been depicted as falling about the sitter, and very incongruous some have been, inasmuch as it was falling everywhere but before the face of the sitter. In others, however, this incongruity has been practically avoided by the sitter holding over the head an umbrella covered with a thin layer of wadding, which might well be imagined would protect the features from the falling snowflakes. Of course, the effect of the falling snow is obtained by "faking" the negative. That is easily done by splashing or spraying the

negative over with an opaque pigment that will print white. One satisfactory method of doing this is to take a little flake white—the moist water colour as sold in tubes is convenient for the purpose—and dilute it with gum water. Then take, say, a toothbrush and touch the ends of the bristles on it, and then pass over them the blade of a knife a short distance from the face of the negative. In this way the colour may be very evenly distributed over the picture, and, if the negative be varnished, it may be wiped off immediately before the face. In any case, the negative should be varnished, because then, if the first essay in "making the snow" is not satisfactory, the colour can be cleaned off and fresh attempts made until it is. Many photographers are just now not too fully occupied with sitters, and the above, in way of a novelty for the stagnant season, may be of use, especially if we should happen to have a long and snowy winter.

OLD TONING BATHS.

It is singular that with the need that naturally must exist for exactness of formula in the apportioning of the various chemicals that go to the making of gelatine plates and of P.O.P., there should co-exist such empirical formulæ for their use, and, to refer to the subject we treat, such variation in the proportion of the constituents of the toning bath as given by the various makers. With regard to plates, it might be said that the makers' formulæ should be adhered to, as they best know the one adapted to their own preparations. That this is not always a correct view to take we can assert from our own experience, and it is probable that the same might be said of toning formulæ.

Taking albumenised paper first, it will be observed that that want of exactitude we have often deplored is conspicuous in published formulæ. Chloride of gold, or the double salt of gold and sodium or potassium, which has for a long time past almost superseded it, is by no means a product of such uniformity in regard to acidity that this condition may be ignored. Yet how often is it referred to? True, there is, for the universal acetate bath, sometimes recommended the addition of carbonate of soda in quantities suggesting either its addition for neutralisation or its properties per se; but this brings exactitude no nearer. How much better would it not be always to state that neutralisation should first take place before the addition of the salts? There would then be far less uncertainty of results. We cannot, it is true, reduce formulæ to the exactness of statement of a chemical equation, but the nearest approach to it that we can obtain the better, and the recommendation we make is one step in that direction.

There is one point, too, that is generally insufficiently dealt with, and that is the keeping properties of such baths. Usually we are told to mix up a fresh bath each time it is required. Now, it ought to be known that such advice is quite needless. Broadly speaking, taking the baths in common use—gold, with either carbonate, phosphate, or acetate of soda—their keeping properties are entirely different. A carbonate bath ripens in an hour or two, and soon becomes incapable of toning. A phosphate bath takes a little longer to ripen, and may retain its toning properties for a day or two. An acetate bath takes two or three days to thoroughly ripen; but once in good order will keep in good condition for weeks; we have used it when two or three months old.

Turning now to P.O.P. baths. Till recently there was a universal consensus of opinion that the old alkaline bath was unsuitable, but there has comparatively recently been put upon the market a paper for which either the "alkaline" or the sulpho-cyanide is indifferently recommended. But, taking the sulpho-cyanide bath formulæ as published, we find the same ignoring of the conditions of acidity, and, further, a considerable variation in the proportion of gold to sulpho-cyanide. Variations in strength of gold per ounce of toning bath recommended we take no notice of, as it is a matter of personal judgment, and does not materially affect results, and the greater or less gloss of surface or its permeability to solutions will naturally vary according to make. But why should one set of instructions direct us to mix one part of gold to about seven of sulpho-cyanide when another says seventeen, and others still take a middle course, and give one to ten as a suitable recipe? To get the utmost value out of the materials, the sulpho-cyanide must perform a junction of ascertainable extent, but what that is has never been formulated for one make of paper or another.

Then, again, as to the manner of mixing the ingredients, the instructions hitherto printed have usually been most bald. For example, little or nothing is ever said about the temperature. It is not expected that every photographer going about his work should carry a pocket thermometer, but some indications might be given as to the difference brought about by variations of temperature in mixing the bath. While discussing this point, we might point out that the temperature of the toning bath when in actual use is an important consideration. A bath, which, when cold in winter time through being kept in a room without a fire will scarcely tone, will quickly act when raised in temperature a few degrees—60° to 70° is suitable; the latter to be considered a maximum with P.O.P., in view of the possibilities of blisters.

Finally, to consider the question of the keeping power of the sulpho-cyanide bath. It is almost universal in practice and in printed instructions to mix it afresh each time it is wanted, but we know the case of a well-known photographer, who is also a dealer, who, in his own practice, and also in selling to his clients, makes up a large quantity at once, and uses it and sells it months after mixing. He makes it up in a concentrated form, and when compounding a new bath adds water in suitable quantity, never throws the bath away, but simply strengthens it from time to time by adding, not chloride of gold, but the concentrated bath. Judging from the results we have seen, nothing could be better, and what a saving of time and trouble such a system means! In conclusion, we may summarise our remarks by saying that, in our opinion, the complexity and contradictoriness of published formulæ might be greatly ameliorated with advantage to the user in time, trouble, and expense.

THE MEASUREMENT OF LIGHT.

As Mr. F. M. Steadman insists upon being taken seriously, though it is is almost impossible to do so, it is incumbent upon me to take further notice of his observations upon the laws of illumination, and my remarks thereon. The first thing to be done is to protest against his unwarranted use of my name as being a party to his theories. Mr. Steadman is "glad to see that Mr. Webster .... does not believe

in the 'farce' that is so generally accepted as a law of light." It is uncertain which law he refers to, so that may pass; but later he claims me as siding with him in his contention that the R. P. S.'s theory that a diaphragm *f*-8 having four times the area of one of *f*-16 admits four times as much light is incorrect. I do not agree with him in this denunciation.

Mr. Steadman says he has not advanced "a single word concerning his own theories of light and space:" well, he has given his views that all the scientific men of eminence who have stated a law regarding the diminution of light in proportion to the square of the distance are wrong, and he has given examples which show that he either misunderstands the law or has misrepresented it. It is necessary to requote what I refer to in Mr. Steadman's original essay.

"Suppose a so-called 'point' of light be 1 cm. from a surface which has an area of one square metre. We see a spot of illuminated light and a swift approach to shadow all around the edges of that illumination." This example proves the truth of the denounced law. The edges of the supposed plane are further from the point of light than its centre, and necessarily receive less illumination, the extent of the diminution being, as could easily be shown, in inverse proportion to the square of the distances. I am misquoted as saying Mr. Steadman's paradoxes "are founded on the *error* of treating a point of light radiating on to a plane surface in close proximity." I did not use these words, but I did show that this particular case of the supposed application of the rule was in no way an example of the rule failing. It would, perhaps, be better to give the rule in the words of a well-known authority. In Glazebrook and Shaw's "Practical Physics," which is likely to be in the possession of most readers interested in such topics, we find a reference to "the law that the intensity of the illumination from a given point varies directly as the cosine of the angle of incidence upon the illuminated surface, and inversely as the square of the distance of the surface from the luminous point." This is simply a question of mathematics, and I again point out that Mr. Steadman's mistake arose from his belief that the particular instance he gave was a fair illustration of the application of the law and of the untruth of the law. He now speaks of exceptional conditions of light: it does not matter how exceptional they were. I never, as he states, called the conditions an error, and the accepted law does explain the result of the conditions, and the law is not in error, as he suggests, nor has he the slightest justification for asserting it to be "an absolute falsehood." Mr. Steadman finds fault with the complex nature of the conditions laid down to obtain a mathematical presentment of a law in the abstract, and asks, "Can it be true that we must measure the area of our subjects when we are about to photograph them?" No one said we had to do so. An introductory chapter on the underlying principles of the use of a photometer is not a treatise on photographic exposures.

Mr. Steadman should know that with regard to most questions of illumination in regard to photographic work, close approximations only are needful. No one could discern, by mere naked-eye inspection, any difference in gradations of two negatives with respective exposures of 99 and 100 seconds; hence any closer calculation than one per cent. would be as futile as working a sum out to five places of decimals, when the amounts dealt with could not be relied upon nearer than the second place. So it is with light measurements for photographic purposes; so it is with diaphragm measurements, which are perfectly useful for all practical purposes in the concrete, though in the abstract they are only correct under conditions of their positions with regard to the lens or lenses which may be considered negligible in practice.

In seeking to combine absolute mathematical correctness of terminology with practical every-day photographic work, Mr. Steadman is pursuing an *ignis fatuus*. I commend to his consideration, in this connection, the somewhat strong language of Professor Perry, in his lectures on "Practical Mathematics," published by the South Kensington authorities. He says, "When calculating from observed quantities, it is dishonest to use more *figures* than we are sure of." The usual rule as to the working power of diaphragms is only a sufficiently close approximation for practical work, and the R.P.S. never claimed more for it.

G. Watmough Webster, F.C.S., F.R.P.S.

ESSENTIALS FOR SUCCESS IN ALBUMENISED PAPER PRINTING.

[A Paper read before the London and Provincial Photographic Association.]

It is a debatable point with myself whether I am justified in expecting your attention to-night for even a short space of time while I review in the most cursory manner some details of albumenised paper printing.

To many of you, albumenised printing has become little more than a memory, and you look back, self-pityingly, upon those unregenerate days when the silver bath for plates and paper sufficiently met all needs of your photographic life. To others among you, the process is mere history, as much played out and almost as bizarre as colza oil for street-lighting. Feeling, as I do, that you may regard this printing process from either of these standpoints, you will scarce wonder that I have some doubts as to the result of my temerity. If I advance any apology for bringing to your notice what many regard as an obsolete process, it must rest largely on the fact that it seems to me regrettable so many latter-day photographers have no opportunity of realising the simplicity and merit of albumen printing now that it has practically disappeared from the workroom and from current literature.

If you were asked to decide upon the technical merit of the silver print of to-day when compared with its predecessor on albumen, I question whether the older workers among you, reflecting on the high-water mark of albumen, would allow that any distinct advance was observable. My own impression, derived from an observation of general professional work, is, that the albumen print possesses a refinement of appearance and a quality of tone not to be seen in the gelatino-chloride print of to-day. Two factors eminently contributive to the popularity of gelatino-chloride are, its high surface and its capacity of yielding reasonably good prints from unreasonably bad negatives. Lest I should lay myself open to the charge of bias, it would, perhaps, be wise to state that no one is more fully alive to the superior results of gelatino-chloride in certain directions than am I For scientific work, as for instance, photo-micrography, it is in my estimation unrivalled. Or, again, when it is necessary to obtain the best possible print from a negative of inferior quality, I am bound to confess that albumen is not so satisfactory as its rival.

The point that I wish to emphasise to-night is the fact that in albumen we have, suffering undeserved neglect, a process capable of giving prints which, as silver prints, cannot be excelled for quality of image, tone, and surface. The manipulative skill required to secure good results with albumen is certainly not greater than with gelatine; for my own part I should say it was much less; while the robustness of the albumen film secures a comfort in working unknown with gelatine. If we compare the relative stability of the two processes, I think the advantage is very largely in favour of albumen. Doubtless many members of the London and Provincial have in their possession albumen prints that count up some thirty or forty years of life, with a vigour and freshness which are an emphatic negation of the assumption that, because a print is a silver print, 'Brief life is here its portion.' I myself have the greatest confidence in the permanence of an albumen print when it is conscientiously produced. Whether the gelatino-chloride prints now being produced will stand the criticism of a generation of photographers forty or fifty years hence, it is impossible to say.

From this brief review of the merits and demerits of the albumen process, I will pass to the practical working of it, limiting myself to a few points that, in my experience, materially contribute to a successful issue. At the outset, the character of the negative claims our careful consideration. It may be asserted in no equivocal manner that it is useless to expect a rich, finely toned print on albumen paper from any negative that lacks a considerable amount of quality. A thin, over-exposed negative can never be successfully printed in albumen; neither can its opposite, the under-exposed and over-developed negative. It may be unfortunate, but it is a fact, that any prospective worker in this printing process must resign himself to make negatives of rather an advanced quality. The exposure of the plate should be sufficiently accurate to give a negative in which the deepest shadows remain unveiled and the

density of the negative must be such as would merit the popular term "plucky." The large amount of success that rewarded the early workers in albumenised paper was, I think you will agree with me, due to the fact that, having only one printing process to consider, they, by a system of trial and error, arrived at a quality of negative accurately adjusted to that printing process. It by no means follows that, to obtain high-class albumen prints, it is necessary to have collodion negatives; equally good prints can be obtained with a gelatine negative if its quality is sufficiently high from a technical point of view. The chief essential, then, for a good albumen print is a negative with unveiled shadows, high lights not too dense, and the general opacity somewhat greater than is usual with negatives for chloride printing.

At the present time the consumer of albumenised paper has not the varied choice that obtained when the process was more popular; but it may be safely asserted that the quality of paper to be obtained in the market at the present time is very reliable, and capable of yielding highly satisfactory results.

Possibly, the salting of the paper is lighter than is consistent with ideal results in albumen printing, for an albumeniser recently told me that he did not advise his paper being floated on a silver bath stronger than thirty grains to the ounce, and this points to an amount of salting that, in my estimation, is much below the normal. Generous salting is conducive both to stability and quality, and a less quantity than thirty to forty grains per ounce is inadvisable, though I very much doubt whether the papers at present in the market contain anything like this quantity. Lightly salted papers and thin, flat negatives have done very much to bring about the neglect of albumen paper printing. Before passing from the consideration of salted paper, there is one point to which I would like to refer (unfortunately it is a point very largely beyond the control of the photographer): it is, the state of the albumen used for albumenising the paper. Anything but perfectly fresh egg-albumen should never be used, if paper that will keep after sensitising or prints that will last after production are required. It is the very worst economy to buy low-priced albumenised papers, as the waste associated with their use quickly over-balances the few shillings saved on the purchase, and, what should be of far more consequence to the conscientious photographer, there is always the danger that prints made on other than fresh albumen will fail to stand the test of time.

It will be readily understood that the silver bath is an essential to success which demands considerable attention. When I reflect upon the printing-rooms it has been my lot to see, and the treatment of the silver bath used therein, I cease to wonder that albumenised paper has fallen into disuse. Anything more empirical than the management of the silver bath it is difficult to conceive. My experience has been that disaster was the result, either of working with an insufficient bulk of solution, neglecting to keep its strength to a proper standard, or through allowing it to become acid and charged with organic matter. Formulæ for sensitising baths are given, which contain some such additions as alum, glycerine, or a nitrate of some description; but a plain nitrate of silver bath rendered alkaline with sodium carbonate cannot possibly be beaten. The strength usually recommended is fifty grains to the ounce and this should be the minimum; I regard sixty grains as a better all-round strength. Great attention should be given to ensuring a neutral bath and freedom from organic matter. Paper from a neutral bath tones more readily than from an acid bath, the tones are better and less gold is used; while a bath kept free from organic impurities gives prints with purer whites and a paper which keeps very much longer after sensitising.

Preparing sensitive albumen paper that will keep for a considerable length of time is generally accomplished by the aid of citric or tartaric acid, and although the advantage of possessing a paper that will keep for a prolonged period is undeniable, it is doubtful whether the best results are obtainable on paper containing acid as a preservative. Certainly its working is rendered more difficult. I have kept paper sensitised on a neutral bath perfectly white for three or four weeks in the cooler months of the year without any preservative being added, and by sandwiching the sheets between blotting board, saturated with sodium carbonate, and then placing the pile under heavy pressure, this period may be easily doubled or trebled. But it should be understood that it was a high-class albumenised paper coated with fresh albumen.

The toning bath is the test of successful working in albumenised paper printing. If the paper is good and the silver bath working at its best, the prints will tone steadily through various shades of brown to brownish-purple and purple. At any one stage, if the negative is of good quality and the paper reliable, the print will be rich and "plucky," and can be removed from the bath when the exact tone to suit individual requirements has been reached. It is to secure this facile toning that such care of the sensitising bath is recommended. Let this bath become acid and contaminated with organic matter, so that the paper prints red and muddy, then troubles of all kinds will make their appearance in the toning bath; protracted toning, bad colours and stained whites. The temperature of the toning bath is a point of considerable importance if reliable and even toning are desiderata; too low a temperature practically stops toning action, whilst over-heating the bath makes it unmanageable, and is inimical to anything like satisfactory tones. My own toning bath is kept at a constant temperature of 70° F., and I find the prints at this degree of heat tone richly in seven minutes from the times of immersion. An element of irregularity is often introduced into the toning bath by neglecting to neutralise the chloride of gold used in making it up. Anything like acidity in the toning bath should be carefully guarded against; in fact, it may be said that, all through the various operations of albumen printing, alkalinity is the key-note of success. Even in the fixing bath acidity is a condition the wise photographer will obviate if he values the tones of his print and its stability. Care in fixing is the crown of the photographer's operations in albumen printing, for, as it has been pointed out by, I believe, a member of this Association, a well-fixed print is more to be desired than great washing. "Fix thoroughly in two baths made alkaline," should be a motto in every printing-room, and the prints should be continuously separated during the whole time allowed for fixing. Not only is long washing unnecessary, it is detrimental to the brilliancy of the print. The quicker washing operations are conducted the better for the print. Some prints in my possession made about eighteen years ago, which were washed by hand for forty-five minutes, then mounted, are in perfect condition, although no special care has been taken of them.

Before closing, I would like to refer to the permanence of a print on albumenised paper. The fugacity of a silver print has passed into a photographic proverb, but I myself fail to see that prints on albumenised paper leave so very much to be desired in this respect, after all. It is not the process, but its exponents, against whom the charge of unstableness should be brought. There are photographic workers who would make of even carbon and platinum evanescent processes were any loophole for doing so left them. Some time ago I picked up at a second-hand bookstall a copy of Hearn's "Practical Printer," published in 1874. The frontispiece is an albumenised print, which shows not the least deterioration, although twenty-eight years old. It is not difficult to estimate from its present condition that another forty or fifty years of life will find it still an excellent print. Other silver prints in my possession are close upon forty years of age, yet are perfectly good. Therefore I am convinced that, if one worked with permanence as a goal, albumen printing might be made a process sufficiently permanent for all practical purposes.

It was my intention to specially print and tone some examples to bring down this evening, but, unfortunately, pressure of business has prevented my doing so, therefore I have to content myself with showing you prints at least three or four years old. I also pass round a negative that fairly well represents the quality necessary to give a satisfactory albumen print, though it would be better with a slight increase of density.

In conclusion, gentlemen, you, even better than myself, know how inadequate to the subject this paper is. My desire has been to lay some stress on cardinal points in albumenised paper printing, the working details of which are matters of common knowledge. If my paper should provoke a discussion in which some of the fund of information possessed by the London and Provincial on the subject be exhumed, I shall be amply rewarded, and shall feel that I have done a signal service to a most deserving process.

GEORGE T. HARRIS.

THE ARTS OF ENGRAVING.

[A Paper read before the Edinburgh Photographic Society.]

I.

It is frequently found that it is the commonest things in life regarding which we have the least definite knowledge. We have been familiar with them from childhood, and it seldom occurs to us to inquire into the why and wherefore of their being, and I venture to think that the various methods of engraving are less generally understood than are the processes employed in the practice of the other graphic arts, in spite of the fact that engravings are much more frequently brought under our notice than either sculptures or paintings.

We can all recognise readily an oil painting, and would not confuse it with a water-colour drawing; but in discussing prints with genuine art-loving people, I find comparatively few who can discriminate between an etched and an engraved plate, or who could tell, for example, to what class of engraving the print now upon the screen belongs. You will recognise it as a work by Albert Durer, and you can readily appreciate the power of the composition, the characteristic strength of the drawing, and the exquisite sentiment conveyed by it; but my object is to endeavour to show you that there are other points of interest, and peculiar beauties inherent in each kind of engraving, to appreciate which it is necessary that the observer should have some elementary knowledge of the method by which each kind of engraving has been produced.

As I have said, you all know the essential difference between an oil painting and a water-colour drawing, and would never dream of looking for the qualities in the one which you would naturally expect to find in the other; but it is quite a frequent occurrence to hear a pen-and-ink drawing spoken of as an etching, which is quite sufficient to prove that the peculiar beauties of an etching are as yet entirely hidden from the speaker, owing, in all probability, not to his incapacity to appreciate them, but simply to the lack of a little technical knowledge. I trust, therefore, that I may be able to explain the general principles upon which the various kinds of engraving are based, to such an extent, at least, as may enable those of you who have only a superficial knowledge of the subject to take a more intelligent interest in it, and I trust that those of my audience who are already well versed in the various methods and processes, may at at least derive some pleasure in recalling and reviewing the work of the masters of this fascinating art.

Engraving, in its widest sense, is the art of incising designs upon any hard substance, and has been employed for many centuries in the ornamentation of all kinds of metal work; but we shall confine our attention, however, to the processes of engraving which have for their object the production of printed copies.

And first I would ask you to note that all such processes may be divided into two distinct classes.

I have put a list of them upon the screen.

Relief Engraving.	Intaglio, Line or Steel.	
Woodcuts in black line.	Stipple.	Lithography.
Woodcuts in white line.	Etching.	
	Dry point.	
	Mezzotint.	
	Aquatint.	

I have added lithography to this list, although it is not really an engraving process at all, as the prints are taken from a flat surface, but the results are so similar that we must include it in our list.

We shall notice the relief process first, as it is the commonest of all the methods of engraving.

As I have mentioned, there are only two kinds of relief engraving, viz., woodcuts in black line and woodcuts in white line, and in each case the process is the same, the difference only being in the manner of cutting. The print upon the screen is a black line woodcut. It was the earliest method of woodcutting, and in theory the process is very simple.

The engraver must first provide himself with a suitable block of wood. It must be hard, of an even and close texture, capable of being cut smoothly and readily, and with no tendency to fray or split. Cherry, pear-tree, and similar woods are sometimes used, but box-wood is that which is most frequently employed. It is cut to about an inch in thickness, and the surface is levelled and polished, great care being taken that it should be of a perfectly uniform thickness throughout. The design or picture is next drawn upon the surface in a black ink, and the block is then ready for the actual engraving, which consists in cutting or gouging out the portions of the surface upon which there are no ink lines. This is a very slow and laborious process. It is performed with a variety of small and exceedingly sharp chisels and knives, and very considerable practice and experience is necessary to avoid cutting away parts of the design, which, you will observe, occupies by far the lesser portion of the surface of the block. This is the whole process. The principle employed is simplicity itself, and yet the possibilities are so great that there have been comparatively few really great woodcutters. The process of printing is precisely that employed in the printing of type. A hard roller charged with ink is passed over the surface of the block, so that the portions in relief become coated with a thin even layer of ink. A sheet of paper is then placed upon the inked block, and pressure is applied, when the ink becomes transferred to the paper, and the print is produced.

When and by whom woodcutting was discovered is uncertain. The Chinese are supposed to have known it thousands of years ago, but it was only rediscovered in Europe early in the fifteenth century. Germany and the Low Countries each claim the honour, and it certainly came into use in both countries about the same period. The print I show you upon the screen is one of the earliest dated woodcuts known. It is called the "St. Christopher of 1423," and is a production of Germany. Here, again, you have a Flemish woodcut also of the fifteenth century, and you will observe that the art in these prints is not of a very high order. Heavy angular lines outline the figure, there is no shading to speak of, and the muscles of the face or of the body, the folds of the dress, etc., are suggested in the most awkward and primitive manner. Practically all the very early woodcuts are of religious subjects. The Church at once recognised the value of the new process, and found in it a means of disseminating pictures of saints and Madonnas among its poorer monasteries and among the public at large. Very few persons could afford to buy oil paintings, but almost any one could purchase the little sheet of paper which showed him a black-and-white picture of his patron saint, and so the method was long used in a purely commercial way before it was discovered that in the hands of a true artist it was capable of producing results which would be prized for their higher qualities. It is to Albert Durer that we are indebted for suddenly raising the craft into a fine art. His original mind conceived its possibilities, and in his hands, and under his direction, a new era was begun. Not only was a different class of drawing introduced, but the mechanical crudities of the cutting also disappeared, owing to the employment of a more intelligent and higher class of craftsmen. I say employment of craftsmen, for it was not Durer's custom to undertake the mechanical craft of cutting. He may have carried out the complete process himself in a few instances; but, as a rule, he contented himself with drawing the design upon the block, and employing assistants to do the more laborious portion of the work. Here we have another of his cuts upon the screen. It is a picture of the Nativity, and you will at once see the tremendous advance which had been made as compared with the St. Christopher. At once the art of black-line woodcutting had leapt into the highest place which it was destined to occupy. The method was wonderfully suited to express the strongest characteristics of Durer's genius, and many critics are of opinion that his most impressive work is to be seen in his woodcuts.

Durer had a marvellous faculty of seeing broadly and simply, and his superabundant creative energy led him to express himself strongly. He could therefore in this art aim at an effect of grandeur which he never reached in oils nor even in engraving, for his engravings, which we shall refer to later, were too delicate to express the most imposing creations of his mind.

I ask you to notice the strength of the composition, the severe beauty of the drawing in this plate, and the exquisite beauty of the group of cupids in the sky. Here we have another of Durer's woodcuts, "The Meeting of St. Joachim and St. Anne," and again we see all the characteristics I have mentioned. Note also the beautiful effect of the simple style of line which he employs, and from a technical point of view I would ask you to notice how little cross-hatching there is in the shading. The reason of this is obvious. Wherever there is a crossing of lines, the engraver has patiently to cut out one by one the little squares or diamond-shaped spaces of white which remain between the lines, whereas when the black lines are drawn parallel to each other, the intervening space becomes a white line, which the engraver can remove with one continuous cut of his chisel. This is just one instance of how the peculiar nature of the process influences the style of the original drawing, and explains why the artist adopted this particular manner of line.

B

Thus it will be found that the more intimate knowledge one has of the method of production, the more intelligent interest one will be able to take in the result, and will be enabled more fully to appreciate the genius of the producer.

To this period also belong the woodcuts of Holbein, his "Dance of Death," etc. I show you one example, "Death and the Abbot." This one block will be sufficient to show that, so far as technical qualities are concerned, Holbein's woodcuts do not differ greatly from Durer's, and, indeed, so far as black-line engraving is concerned, there has been no change in the method of production up to the present day. The woodcuts of the caricaturist Keene or the woodcuts of Sir John Millais, beautiful line drawings, have been produced in precisely the same fashion. If they seem to differ, it is because they say different things, not because they employ different means. As my intention is not to deal so much with the great engravers as with the processes of engraving, we shall pass on to the next division of our subject—white-line wood engraving.

In a very modified way this method was used by the early woodcutters to reproduce a class of drawing which was much favoured by the old masters, viz., that of drawing with black chalks and white chalks on a tinted paper.

To make a facsimile of this the engraver first made a black-line woodcut, representing the black lines, and this was printed on the paper. He then procured another block of the same size and cut out the portions representing the white lines. This block was then inked up with a transparent-coloured ink representing the tone of the paper of the original drawing, and was then printed on the top of the black-line impression. This gave a complete tint to the print, with the exception of the portions which had been cut away, and, these not printing at all, represented the artist's white chalk lines. This was the first use of the white-line process, but it was not until modern times, when illustrated periodicals became a factor in our everyday life, that white-line engraving developed into its present state. It was felt that the simple line block had become monotonous, and there was a desire to reproduce tones and tints, so that the chiaroscuro, the sense of air and distance in the original drawing or painting, might be reproduced as well as the mere outline. In this country, at least, the celebrated Newcastle wood engraver, Thomas Bewick, was the first to regularly use the white line. Bewick was more of a naturalist than an artist, and most of his blocks were reproductions of birds and animals. I show you one of his blocks upon the screen, and I think you will be able at once to see the change of method in his work. Instead of drawing black lines upon his block and laboriously cutting round each of them, he cut continuous white lines and allowed the remaining spaces to print black. There is not much opportunity of showing aerial perspective in this work, but he obtained an appearance of naturalness in the representation of his specimens which would have been quite impossible by the older method. But the great matter was that it was he who changed the principle, and suggested to other engravers and artists what might be done by the method.

I show you here another block by the eminent wood engraver, W. J. Linton, which will more clearly explain the process. It is a reproduction of a head by Titian, and you will at once see the capacity of the method in reproducing tone values. I have enlarged a small portion of it, to show you more distinctly the character of the work. You will now see, I hope, quite clearly the sharp white lines cut at all angles, sometimes parallel, but more frequently cross-hatched, and producing the effect of high light or middle tone according to the closeness or sparseness of the white lines. This is the process, then, which has until quite recently produced the great majority of the illustrations in our books and magazines. It has provided employment for thousands of craftsmen, and there have been numerous minor modifications. For instance, here is another example. It is a pure white-line woodcut, but instead of being worked in the free artistic style of Linton, it is composed of a series of very carefully engraved parallel white lines which produce the effect of roundness by their width at various points. I will enlarge the head so that you may observe the lines more clearly. Owing to the great magnification I expect it will appear very coarse, but I hope you will still be able to notice the subtle modelling of the nose, for instance, although all the lines run in a horizontal direction.

I have said that until quite recently, almost all the illustrations in our books and periodicals were produced by this method, and that was true until seven or eight years ago; but now the rude hand of science has practically killed the art of the wood-engraver, and you may look over almost every magazine published in this country and America and not find a single woodcut in any of them. Everything has had to give place to the cheaper, more precise, and more rapidly produced photographic process block. In many respects this is a matter for regret, for the woodcutter's art, in the hands of a genius, was beautiful in itself, quite irrespective of the subject which he engraved, and I counsel those of you who possess fine examples of woodcuts, to treasure them carefully, as they will rapidly become scarce. It is quite undeniable that a fine process block is infinitely better than an ordinary mechanically cut wood-engraving—one has only to compare a copy of to-day's "Graphic" or "Illustrated London News" with one of twenty, or even ten years ago, to see that—but there is an entire lack of the personal element in a process block which made the fine wood-engraving interesting in itself. There will doubtless always be sufficient art-interest to support a really good wood-engraver, but it is an art which requires a long laborious apprenticeship, and it is very questionable whether we shall find many men willing in the future to undergo this severe training, on the chance of their turning out sufficiently eminent to make a success in life, in what will soon be considered an obsolete art craft.

We shall now turn out attention to the second and most numerous class of engravings—the intaglio processes. This class, you will remember, includes line engraving, etching, and mezzotint; and the general term, intaglio engraving, refers to the fact that all these methods are alike in this, that the picture, instead of being printed from the surface of the ridges, as in a woodcut, is printed from the hollows between the ridges. I wish you very clearly to understand this point, and have prepared a diagram to make my explanation quite distinct.

This diagram shows first the section of a woodcut, underneath we have the same block inked up ready for printing—you will observe the even coating of ink on the surface of all the ridges, then we shall suppose that it has pressed against the sheet of paper, and ink has been transferred to the latter.

On the right side of the diagram we have the section of an intaglio plate. It is a sheet of soft metal, generally copper, and a design has been cut upon it with a graver, or burin, as it is called—the V-shaped hollows are sections of lines so cut. Now to print this plate, the whole surface is covered over with a thin ink, which is rubbed well into all the hollows, and when this has been done, the ink remaining on the surface is carefully wiped off, and the plate appears as you see in the lower drawing. A piece of soft paper is laid upon the surface of the plate, and subjected to a very heavy pressure, which has the result of transferring the ink from the hollows of the plate to the surface of the paper. You will at once see the marked difference in the character of the impression.

In the case of the woodcut, the blackness of the lines depends on the width of the lines only, but in the intaglio engraving, the blackness of the lines can be intensified or modified to any extent by increasing or reducing the depth of the incisions. The individual character of each of the intaglio prints is due to, and depends upon the shape and style of the incision on the surface of the plate. In each process, the incision or hollow is produced in a different manner, and we shall now consider these in detail, and note the various results which are thereby produced.

The oldest and simplest is burin or line engraving. It is frequently spoken of as steel engraving, but the term steel engraving is quite meaningless, as any method may be employed on a steel plate. However, it is useful to remember that when a steel engraving is spoken of, it is generally a line engraving which is referred to.

I dare say most of you have had your visiting-card plate engraved, and have seen the plate—that is in its simplest form a line engraving, the only difference from a picture plate being that, instead of a single line following the letters of your name, the engraver has to cut a multitude of lines to produce the forms and tones of the picture. This process was discovered rather than invented, as for many years engraved plates were produced by the metal workers of Italy, before any one thought of making use of them to produce printed impressions. The honour of being the author of the little thought which was to prove of so great value is ascribed to a Florentine goldsmith, or "niello" worker, Tommaso Finiguerra. The niello was a little silver or gold plate, on which an ornamental or pictorial design was cut, and the hollows being filled up with some black material to show up the design, they were inserted as embellishments in miniature portable shrines and other pieces of ornamental metal work. It was the custom of Finiguerra to test the progress of his work by filling up his engraving with soft black colour, and pressing a piece of soft

white wax against it, when the colour became transferred with great clearness to the surface of the wax, and exhibited his design, and one day it occurred to him that there was a value in the process other than his temporary one. For his dry colour he substituted printing ink, and for the wax soft paper, and so the art of printing from a line-engraved plate was discovered.

This occurred about the year 1440, about the height of the Italian Renaissance, and the great artists of the period were not slow to see the value of the process. Botticelli engraved a series of plates illustrating the "Inferno" of Dante, which was published in 1481. Andrea Mantegna engraved many plates, and the graceful draughtsman, Marc Antonio Raymondi, devoted almost his whole time to engraving. Most of the engravers of this period were painters also, and engraved their own works, but Marc Antonio engraved chiefly the works of Raphael, by whom he was employed, and who superintended the carrying out of the work. The engravings of these artists are very valuable, not only from their scarceness and as illustrating the early history and progress of the art, but as exemplifying many high qualities which have never been surpassed in later times. Indeed, in the hands of such masters of artistic power one cannot be surprised that the simple mechanical process should soon have been brought to perfection. The characteristics of the engravings of this period are naturally those of the paintings.

The early Italian painter's ideal was to produce a perfect drawing, composed of exquisitely curved lines arranged in an entirely graceful fashion, and no attempt was made to interpret the whole visual synthesis of nature, or to show all the visible qualities of natural appearances, as the best modern painting does. Thus we find their engravings also exceedingly abstract, representing natural objects only by one or two of their qualities, such as outline and projection. They learned to draw with the burin upon the copper exactly as they were accustomed to draw with the brush or silver point upon paper—that is, to get the outline pure, clear, and firm, and then to shade with simple straight lines, slanting downward, either from right to left, or from left to right. These early Italian prints, therefore, might be described as shaded outlines, no attempt having been made to obtain the great richness which this process is so admirably adapted to produce. It would be puerile, however, to express regret on this account, as we possess in these engravings some of the most exquisite drawing which has ever been produced. Hamerton says regarding the engraving of this period, that it will be convenient to remember the early Italian school of engraving as a school of outline, which in all graphic arts is the beginning of culture. If the outlines are beautiful and full of exquisite modulation, then the art is in a beautiful childhood, promising other kinds of beauty in its maturity, and more particularly the beauties of modelling and composition.

The art soon spread to Germany and the Low Countries. In the latter it found a masterly exponent in Lucas van Leyden, and in the former it was practised by Michael Wohlgumuth, and later, and in greater perfection by his celebrated apprentice, Albert Durer. Durer excelled in everything he attempted. We have already spoken of him as having raised wood-cutting from a mechanical craft to a fine art, and in line engraving we find him devising a style of his own, which he executed in such perfection that no successor has yet been found to rival him. Marc Antonio, indeed, copied some of his plates, signature and all, so perfectly that Durer himself could not discriminate between them, and was very wroth in consequence, but during four centuries we have not had a second draughtsman such as Marc Antonio.

Here we have a heraldic print by Durer. As a piece of technical work it is considered his finest engraving. It is impossible in a lantern slide to exhibit the peculiar beauties of such a plate—the exquisite purity and delicacy of each individual line, beginning almost imperceptibly, swelling out into boldness, and dying away as sweetly as it originated. Nor can you perceive the effect of richness caused by the body of the ink, for each line, as I have already explained, lies upon the surface of the paper, like a fine hair or wire of exquisitely modelled thickness. But you can see, even from this lantern slide, I hope, something of the delicacy of the drawing, and sumptuousness of the composition.

Here we have another very celebrated plate of Durer's, "The Melancholia," a marvellous symbolical production, indicating the whole of the more serious aspects of life, and the depression consequent on the height and depth of his tremendous imagination bursting to express itself, but curbed by the limitations of his human nature—though in the distance we see the rainbow and morning star suggesting his hope of greater possibilities hereafter. This plate exemplifies very well one of the most prominent characteristics of Durer's engraved plates. I refer to the extraordinary veracity with which he delineates the various articles which he introduces into the picture. Notice the plane in the foreground. In looking at an original print of this plate one can almost tell the wood of which it was constructed. Note also the hour-glass, the bell, and the scales hanging on the wall. Not a link in a chain is omitted. A mechanic could manufacture exact copies of them, and I understand this has not infrequently been done. When you consider that this plate only measures about eleven inches in height, you will be able to form some conception of the extraordinary mechanical skill which was necessary to produce it. From a strictly artistic point of view this dexterity of Durer's with a graver is somewhat to be regretted, because in insisting so much on the individual perfection of each detail, he has lost the strength and concentration and breadth which we see in his work in other mediums.

J. Craig Annan.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

At the general meeting, held on Friday, December 6, at 66, Russell-square, Mr. Thomas Bedding, F.R.P.S., occupied the chair.

The report of the Committee upon their work since Friday, October 4, was read, as follows:—

Committee's Report.

"Your Committee are pleased to report that since the second general meeting of the Association in London on Friday, October 4, the membership has increased from 422 to 482.

"Five meetings of the General Committee and Sub-Committees have been held in London, and on the evening of Tuesday, October 11, several of the Committee were present, by invitation, at the Polytechnic Institution, when Mr. E. Howard Farmer read a paper on 'The Present Position of Professional Photography.'

"In accordance with a resolution passed at the last members' meeting on October 4, after some correspondence, an appointment was arranged and a deputation of the Committee, consisting of Messrs. Bridge, Lang Sims, Ernest Elliott, W. Grove, Martin Jacolette, Barnett, and Alfred Ellis, waited on the Plate and Paper-makers' Association at the London Chamber of Commerce on the afternoon of November 20 with reference to the subject of dealers' terms for members of the Professional Photographers' Association. The matter was laid before the Plate-makers' Association at great length; and the chairman of that body promised to report its decision in writing. The matter is still under consideration.

"A branch of the Association has been formed at Liverpool under the Chairmanship of Mr. G. Watmough Webster and the Hon. Secretaryship of Mr. A. F. Mowll. The meeting secured an attendance of forty, and resulted in thirteen fresh applications for membership. There are now four branches of the Association in working order, viz., Liverpool, Hull, Edinburgh, Aberdeen. On December 10, a meeting, convened by Mr. S. L. Weston, is to be held at Folkestone, with the object of forming a branch of the Association for East Kent, and arrangements are in progress for holding other meetings at Brighton (East Sussex), Birmingham, Tunbridge Wells, etc.

"The following bye-laws for the government of branches have been drawn up by your Committee:—

1. Local Branches.—The Local Branches Organisation Sub-Committee (Mr. T. C. Turner, 8, Regent's-terrace, Hull, Hon. Secretary) is empowered to select centres in which it may seem desirable to form local branches of the Professional Photographers' Association.

2. Objects of Local Branches.—Local branches shall meet and discuss the objects of the Association as defined by Rule 2, but no independent action must be taken by a local branch without the approval of the General Committee.

3. Officers.—The local members of the Association in such centres may nominate two of their number to act as Chairman and Hon. Secretary of the branch respectively.

4. Duties of Chairman.—It shall be the duty of a Chairman to preside over all meetings, and to administer the local branch in accordance with the rules and bye-laws of the Association, as published in the Official Hand-book.

5. Duties of Hon. Secretary.—The Hon. Secretary shall keep a list of the names and addresses of all the members of his branch; convene all meetings; take minutes of the proceedings; and, within seven days, forward copies of all resolutions to the Hon. Secretary of the Association, 51, Baker-street, London, for the approval of the General Committee.

6. Meetings of Local Branches.—It is desirable that meetings of local branches should be held at convenient times in the months of January, March, May, September, and November.

7. Quorum.—Not less than five members of a local branch shall form a quorum.

8. Meetings for Members Only.—All meetings of local branches must be strictly confined to members of the Association.

9. Local Expenses.—All expenses incurred for hire of meeting room, printing, postage, etc., are to be borne by local branches. The Chairman or Hon. Secretary may act as Treasurer for the local branch expenses.

10. Finance.—The General Committee of the Professional Photographers' Association will not accept responsibility for any expenditure incurred by local branches that has not been definitely and specifically authorised by them.

No departure must be made from these bye-laws without the specific sanction and approval of the General Committee.

That no report of any proceedings of the Professional Photographers' Association or its branches be submitted for publication in the photographic press except through the Hon. Secretary of the London Central Committee.

"Since our meeting in October, in addition to a number of inquiries on various matters, there were two applications for advice from members, which are interesting as examples of the various ways in which this Association can be of service. The first was with reference to making a charge for taking and submitting proofs, in addition to that of the ordinary charge made for copies. The customer contended that it was not usual to make this charge, but only to pay for the copies he actually wanted after the proofs had been shown him, but if the photographer could satisfy him that it was a custom of the profession, he would pay it. Your Committee, in reply, considered that the charges were fair and reasonable; that it was the custom to make an additional charge for attending and proofs, and sent a printed price list for the member to show his customer. Messrs. Barnett, Bridge, Grove, Jacolette, Lang Sims also offered to answer any further inquiries on the matter if required. The second was with reference to exhibiting photographs and enlargements of private sitters after it had been objected to. In this case your Committee recommended that they should be at once withdrawn, and a promise given that they would not be shown again. Your Committee think that, apart from any legal right, the sitter or relations of the sitter may have in this matter, it is bad policy to do anything of this kind against the wishes of their private sitters and friends.

"The subject of invitation sittings has been fully discussed by the Committee in London, and also at the meeting of the Hull branch on November 6. The value of the Association has been strikingly shown by the willingness of Mr. Ernest Elliott to publicly discuss a matter in which his firm are directly interested, and which individual members of the Association have considered it their duty to criticise. Your Committee are pleased to state that as a result of this discussion Mr. Ernest Elliott has promised to give the invitation question his full consideration, with a view to modifying the special work to which exception has been taken by members of the P.P.A."

Mr. W. G. Parker moved, and Mr. Percy Lankester seconded, the adoption of the report, and the same was agreed to unanimously.

Mr. T. C. Turner (Hull and London) said that the work of the Association in the provinces was going along splendidly. There were two gentlemen present to-night who were actively engaged in pursuing this forward movement. He referred to Mr. S. Lambert Weston, of Folkestone, and Mr. Percy Lankester, of Tunbridge Wells, both of whom, he hoped, would have something to say. The movement in the provinces must necessarily take place more or less slowly, as it was difficult to find out in each district those gentlemen who were willing to give up the time necessary for the proper establishment of branches. The profession, he continued, was really under a great obligation to those gentlemen who had volunteered in the country to take up the laborious pioneer work, involving so much loss of time. A great deal of skill was required to bring into line the different photographic interests in the various towns and centres. The chief thing to break down was that objectionable idea that photographers could not combine. He had found that many entertained the view that they would never be able to hold successful meetings; whereas wherever an effort had been made, the realisation that this idea was wrong had exceeded the most sanguine expectations. But that was not all. The first meeting, as a rule, went through all right, but to keep the interest alive was still more important. One could not expect everybody to keep red-hot, and one must also consider the fact that those who are asked to engineer the branches are pre-eminently busy photographers, to whom it means loss of time and money. When men were willing to do this work, however, it was surely the best sign that they realised that the organization was wanted, and was capable of producing a great effect in the future. He considered that many did not realise what a strong position the professional photographers' position was. All great men, social and political, were obliged to come to the photographer's studio and for a time to submit themselves to the professional photographer. Professionals should feel proud of this position, and the Association should go a long way towards moulding a correct line of action towards these people, and in helping to produce a type of etiquette towards clients which would make the professionals' position admired and respected more than ever before. The Association should be the medium whereby a higher standard and a better artistic training amongst professionals might be achieved, and opposition to the forward art movement in photography broken down, so that ultimately it may be the greatest compliment a man may have to see his work hanging in the essentially pictorial exhibitions of the day.

The Chairman stated that the Committee at its meeting that night had passed a bye-law electng Secretaries of local branches ex-officio members of the Committee, so as to bring them into closer touch with the chief executive body. The meeting had the advantage of the presence of two gentlemen—prospective local secretaries, he hoped, and therefore members of the Committee—whom the members would like to hear. He called upon Mr. Percy Lankester to speak.

Mr. Percy Lankester (Tunbridge Wells) said that he had promised Mr. Turner to do what he could in his district. Unfortunately Tunbridge Wells was a town almost by itself, and with no near big town except Maidstone, and he was inclined to think that the best interests would be served if Tunbridge Wells were included in the London district. There was hardly a sufficiency of photographers to make a centre of any size. He thought it would be a very desirable thing if photographers could be induced to be more friendly one with another. He promised to do all he could to form a centre in his district.

Mr. S. Lambert Weston also spoke in support of the Local Branches Organization Sub-committee work.

Mr. Wilkinson (Norwich) was pleased to congratulate the Association on the progressive way in which it was working, and promised to do all he could to forward the scheme. He, too, would like to see one or two representative men come to explain the situation. It would greatly facilitate the formation of local centres in various parts of the country.

Mr. Martin Jacolette (London) said that there was no doubt that amicable discussion and an intention to deal fairly with any question that might arise went a long way to the satisfactory adjustment of many matters of, at first sight, a dangerous character. So many people were inclined to make nightmares of troublesome questions, whereas a little compromise and good judgment invariably brought about a satisfactory solution of the problems. He expressed himself as feeling very strongly upon the question of trade discounts and their extension to the profession. The Plate-makers' Association had been approached in a friendly spirit, and the matter was fairly and honourably put to them. The suggestion had been made that this Association should start its own factory. He could not endorse such a measure, but he thought that the suggestion made by Mr. Elliott, that the Association should start a depôt for the sale of sensitive materials was a very good one. He gave notice that, at the annual meeting, he should propose that the advisability of forming such a depôt be considered. Of course, it could not be done on the existing subscription of 5s. a year! The idea was one that, if carried out, would finally dispose of this discount question. The speaker further discussed the practice of certain papers—the "Sporting Times" and "Free Lance"—in supplying enlargements as a kind of advertisement. He thought that it only wanted putting to the editors or proprietors in the proper light, and they would discontinue the scheme.

The Chairman thought the suggestion a good one. At the last meeting a protest was entered against a similar proceeding on the part of Messrs. Salmon and Gluckstein, the tobacconists, and this protest was communicated to the firm, with, he believed, beneficial results.

Mr. H. E. Hull said that the enlargement was removed from the window of the shop, but he could not say whether the coupon had been withdrawn from the cigarette packets.

The Hon. Secretary (Mr. Alfred Ellis) said that Messrs. Salmon and Gluckstein had acknowledged the protest in reference to their coupon system of supplying enlargements. They expressed themselves as sorry that the Association should think they had a grievance, and proceeded to point out that professional photographers did the work for them, and that the firm itself did nothing in the photographic way. So far from injuring the interests of professionals, the letter maintained that their action resulted in a considerable accession of business to the professionals with whom they placed the orders.

Mr. Hull thought that the people who conducted this system of trading or advertising were not so much to blame as the professionals who supplied the enlargements.

Mr. England (Barnet) proposed that the Committee be asked to take up the action of the papers mentioned, and represent to them that professional photographers considered they had a grievance.

Mr. Wilkinson seconded the motion, which was carried unanimously.

Mr. Lang Syms (London) spoke in favour of some sociable meeting, by means of which the members of the Association could be intro-

duced to one another. He thought the best method of securing such an end would be the institution of an annual dinner, an inexpensive affair, with a little music, and so forth. He put this as a proposition.

Mr. Turner seconded the motion.

Mr. A. Ellis supported the motion, and promised to do all that he could to ensure the success of the function. At his suggestion the arrangements were left to the Committee, the meeting supporting the idea unanimously.

A vote of thanks to the Royal Photographic Society for its loan of the rooms having been carried, the meeting terminated.

The East Kent Branch.

At a meeting held at the Queen's Hotel, Folkestone, on Tuesday, December 10, 1901—Mr. Thomas Bedding, President P.P.A., in the chair—there were present Mr. Bonnaud (Dover) and his son, Mr. Charlton (Canterbury), Mr. Jacob (Sandgate), Messrs. Wheeler and Haddock and Mr. Lambert Weston (Folkestone). All these signified their intention of joining the Professional Photographers' Association and branch. Letters of apology for absence were read from Mr. Martin Jacolette, Mr. Hugh Penfold (Ashford), Mr. Selwood (Margate), Mr. Swaine (Broadstairs), Mr. Thompson (Canterbury), Mr. Houghton (Margate), Mr. Dé Ath (Ashford), and Mr. Burgess (Folkestone), each of whom expressed their entire sympathy with the Association, and their intention of joining. Mr. Martin Jacolette was elected Chairman of the branch, and Mr. Lambert Weston Hon. Secretary. It was unanimously decided to ask the Committee to make some modification of Rule 7 in favour of the East Kent branch, as the branch being spread over such a large area of country some difficulty would probably be found in getting one-fourth of the members present. Mr. Bedding gave an address dealing with the chief subjects now receiving the consideration of the P.P.A. A telegram was received during the meeting from Mr. Alfred Ellis, Hon. Secretary P.P.A., wishing success to the branch, and a long letter was read from Mr. T. C. Turner, Hon. Secretary Local Branches Organization Committee, also wishing success to the meeting and branch.

New Members.

Members elected at the Committee meeting, December 13:—

Auld, James, 101, Princes-street, Edinburgh.
Banks, John (Alex. Ayton), 42 and 43, Bruntsfield-place, Edinburgh.
Cooper, Adam Johnstone (Cooper and Durie), 18, Newington-road, Edinburgh.
Halkett, H. William, 180, High-street, Portobello, Edinburgh.
Heaven, Robert Archibald (Auty and Heaven), Blenheim House, Edinburgh.
Low, Claude, 54, Cockburn-street, Edinburgh.
Mackay, George Ritchie, 105, South-bridge, Edinburgh.
McKean, —, 15, Ferry-road, Leith.
Pursey, Thomas, 2, South Charlotte-street, Edinburgh.
Shaw, Sydney Henry (Bradshaws), The Memorial Studio, Robertson-street, Hastings.
Shiels, J. Drummond, 70-72 Lauriston-place, Edinburgh.

Our Editorial Table.

The Luxia Bromide Papers.

Manufactured by the Luxia Company, Southill Works, Hampstead.

From the Luxia Company we have received two samples of their platino-matt bromide papers, smooth and rough, for contact printing and enlarging. On trying the papers with the metol-hydroquinone formula issued with them they give very satisfactory results. The whites are clear, and the shadows rich in tone. The papers are rapid, but not too rapid for convenient contact printing, while they are rapid enough for enlarging purposes. The following are the instructions for working the papers. Exposure.—For contact printing, place the paper into the printing frame in the dark room. Negatives of average density require an exposure of about four seconds at a distance of twelve inches from the flame of an ordinary No. 4 gas burner. For enlarging, the correct exposure is best ascertained by making a trial on a small strip of paper. Development.—The papers may be effectively worked by any of the usual formulæ, but the following developer is strongly recommended as being clean, economical, and thoroughly under the worker's control:—Sodium sulphite crystals, 1 ounce; water (boiled), 20 ounces; sodium carbonate crystals, 1 ounce; hydroquinone, 60 grains; metol, 10 grains; potassium bromide, 20 grains. Mix in the order given. The sulphite and carbonate should be in pure, clear crystals. In a well-stoppered bottle this developer will keep in good condition for a long period. For use add 1 ounce of above to 2 ounces of water. With less water, harder and more brilliant results are obtained; more water and longer exposure gives softer effects and warmer tones. Several prints in succession may be developed in the same solution. Exceptionally pure whites are secured by immersing the print the moment development is complete, and without previous washing, in a little of this clearing solution for 1 minute, acetic acid 1 ounce, water 20 ounces. After this, well rinse the print, and soak in this fixing bath for 10 minutes: Hypo 4 ounces, water 20 ounces. Then thoroughly wash for about one hour in gently running water or several changes. If preferred, the clearing bath may be omitted, and all that is necessary then is to thoroughly rinse the developed print before fixing.

The "Fernande" Photometer.

Agent: C. A. Rudowsky, 22, Coleman-street, E.C.

A description of this photometer, concerning which some inquiries have reached us, may be of interest to the reader. It has a yellow transparent scale of ten different grades side by side with a fixed scale of darker shade; the scales are in a metal frame, with spiral spring, which presses the top firmly down on the strip of felt at the bottom. To use: Open the top and place a strip of the same paper which is in the printing frame upon the strip of felt inside (sensitised side upwards); when closed, the spring presses the paper firmly against the



scales. The sensitised paper prints through the transparent scale, and takes the tone of the fixed scale at the side, No. 1, which gives the first grade. It is necessary in reading the scale to look straight down on the scale, and to use only dry sensitised paper. For platinum and carbon and other developing papers, it is recommended to use collodio paper for the scale. If a negative is so dense that the grade 10 is not sufficient, a supplementary yellow glass can be inserted in the groove on the top of the photometer, and the indicator at the side moved to the bottom for the insertion of the extra glass.

The No. 2 Brownie Kodak.

Manufactured and sold by Kodak, Limited, 43, Clerkenwell-road, E.C.

The newest Kodak takes pictures $3\frac{1}{4}\times2\frac{1}{4}$ inches upon cartridge film. The size of the camera is $5\frac{1}{2}$ inches long, $3\frac{1}{2}$ inches broad, and 4 inches deep; it weighs 13 ounces, and the length of focus of the lens is $4\frac{3}{4}$ inches. The instrument is covered with a fine grain leather cloth, and has nickel-plated fittings. Two finders are provided — one for vertical and one for horizontal pictures, and there is a set of three stops. The shutter is of the everset rotary type, the exposure lever being pressed to the right or left. For time exposures the photo-



grapher simply has to pull out a second lever, and the exposing lever is then actuated as if making instantaneous exposures. The stops are regulated from the outside of the camera by a sliding rod which shows by its position which stop is in front of the lens. The spooling system is simple and easily managed by those for whom the No. 2 Brownie is intended. The camera makes a very good Christmas or New Year's present for a boy or a girl, and we have no doubt will answer its purpose of inducing young folks to take an intelligent and abiding interest in "serious" photography.

THE PRIMUS DETACHABLE LANTERN SLIDE MASKS.

THESE little books of detachable masks are issued by Messrs. Butcher and Son, of Blackheath, S.E. By means of perforation marks each mask may be singly detached. It is a convenient system. The masks are issued with circular, cushion, square, dome, and oval opening.

"FOTOGRAFIA per i Dilettanti" (by Dr. Giovanni Muffoni; published by Ulrico Hoepli, Milan) is a handbook of nearly 400 pages now in its fifth edition. It appears to have been brought up-to-date. It may interest the average English photographer to know how a familiar developing formula appears in the guise of a foreign language. Thus:—

A.	Acqua	gr. 300.
	Acido pirogallico	gr. 30.
	Solfito di soda anidro	gr. 30.
B.	Acqua	gr. 30.
	Fosfato di soda tribasico	gr. 80.
	Solfito di soda anidro	gr. 30.

THE "Publishers' Circular" Christmas Number, published by Messrs. Sampson Low and Co., Fetter-lane, E.C., contains illustrated reviews of books suitable for Christmas and New Year gifts. In itself it is a beautiful production, which many would choose in preference to many of the books which are noticed in its well-printed pages.

FROM Messrs. Cassell and Co., Ltd., La Belle Sauvage Yard, E.C., we have received two of the latest additions to the "Work" Series of Handbooks, edited by Mr. P. N. Hasluck—"Photographic Cameras and Accessories" and "Optical Lanterns." They are addressed to the individuals, a rapidly diminishing class nowadays, we believe, who take pleasure in the construction of home-made apparatus. As compilations they may, however, be commended; the illustrations are many and good, and the books are sold at 1s. each.

WE have to thank the Editors and Messrs. Dawbarn and Ward, Farringdon-avenue, E.C., for the bound volume of our contemporary, "The Photogram" for 1901, which we value and appreciate as a pictorial record of many phases of photography. We could dispense, however, with the representations of an American photographer posing as Christ, whilst the taste of inserting the reproduction of Frank Eugene's Adam and Eve (page 14) is open to question. We are glad to see Mr. Steichen's "self portrait" on page 8. It does us good to behold what kind of man it is that perceives "grandeur and nobility" in what we think is a crude photographic nude, and who commits himself to the amazing statement that "few paintings contain as much that is spiritual and sacred in them as do the 'Seven Words' of Mr. Day"!!!—We have also to acknowledge receipt from the same publishers of volume 3 of "Useful Arts and Handicrafts." This consists of 312 pages, freely illustrated, and amongst the subjects dealt with are "Adornment of the Home," "China Decoration and Repair," "Paper Work," "Picture and Frame Restoring," "Bamboo Work." The value of this work can hardly be over-rated—indeed, of the many books lying before us as we pen this notice few strike us as being so suitable for presentation to practically-minded persons with an inclination to dabble in the minor arts and crafts.

"PHOTOGRAPHY" Christmas Number (published by Messrs. Iliffe, St. Bride-street, E.C.) contains 24 full-page reproductions from well-known photographs. The accompanying "critiques" are hyperbolical in places, but the production is tasteful throughout and should help to spread a knowledge of good photography amongst the public.

OUR confrère, Mr. F. Dundas Todd, of "The Photo-Beacon," Chicago, U.S.A., lays himself open to the accusation of seeking to spoil our Christmas dinner by sending us a copy of a book he has written entitled, "What are we here for?" The book is well written, but with a marked tendency to exaggeration and gush. We are here, according to Mr. Todd, to learn the facts of nature and the great laws that govern them. In 140 small pages it is impossible in the handling of so vast a subject to avoid superficiality of treatment; and a perusal of the book only convinces us of its futility. We quote: "Man is no degenerate. . . Bit by bit he is renouncing the brutal parts of his origin, replacing them with finer mental susceptibilities (!) Instinct he is replacing by reason, rage by indignation, sexual desire by love. Realising his glorious progress in the past, we can but wonder to what heights he will attain in the future." It was possibly at such rhodomontade as this that Bulwer Lytton directed that exquisite satire, "The Coming Race." Come down from your pasteboard pedestal, friend Todd, and give over these idle day-dreams.

THE latest book by the Messrs. Kearton is entitled "Strange Adventures in Dicky-bird Land." It is published by Messrs. Cassell and Co., La Belle Sauvage Yard, E.C. The bird stories are told in simple language, and make pleasant reading, which, as we have proved by experiment, is much to the taste of young people. We must, however, confess a personal preference for the preface of the book. Here Mr. R. Kearton tells of the trials and difficulties that had to be surmounted in taking the bird photographs which form the illustrations. These photographs are invariably good specimens of work, and should make the book sought after by the large public Messrs. Kearton have succeeded in making for themselves.

"PRACTICAL Radiography."—A third edition of this work, which is by Messrs. A. W. Isenthal and H. Snowden Ward, has been issued. The book has grown to nearly 200 pages, and is so exhaustive of the subject that it should be in the library of every radiographer, physician, and surgeon. The publishers are Messrs. Dawbarn and Ward, Farringdon-avenue, E.C.

"THE Process Year-Book," edited by Mr. William Gamble, and published by Messrs. A. W. Penrose and Co., 109, Farringdon-road, E.C. This beautiful book is with us once more. The illustrations and articles are designed to form "a pictorial and literary record of progress in photo-mechanical engraving and allied arts and crafts." We have grown so accustomed to the feast of illustrative beauty which Mr. Gamble and Messrs. Penrose annually provide for us in "The Process Year-Book" that on the present occasion we can do no more than record our appreciation of the fine volume before us. The letterpress is chosen and edited with acumen; the pictures are so good, so varied, and so delightful that they quite spoil us for any of the Christmas numbers on the bookstalls.

WE have also received the tenth edition of Sir William Abney's "Treatise on Photography" (Longmans and Co.), and Mr. Douglas English's "Photography for Naturalists" (Iliffe). These will be noticed at greater length on a future occasion.

THE ÆSTHETIQUE MOUNTS.—From the publishers of our contemporary "The Photographic Art Journal," St. Martin's, Leicester, we have received samples of a series of mounts designed for the use of "artistic" workers. The mounts are issued in a great variety of tints and in twopenny sheets of the size 20 inches by 25 inches. The sample sets are sold at one and sixpence each; and the mounts may be commended to the attention of those of our readers who incline towards unconventionality of mounting methods.

News and Notes.

THE Burnley Camera Club Exhibition.—The judges for this Exhibition, which will be held from January 16 to 21, are Messrs. A. Horsley Hinton, Alex. Keighley, F.R.P.S., and Llewellyn Morgan, M.R.P.S.

WE regret to announce the death of Mr N. A. Monnickendam, which took place on the 12th inst., in the 66th year of his age. The deceased gentleman was known to many of our older readers as a very able producer of photographic enlargements in black and white, colour, etc.

WE have received a copy of the new illustrated catalogue of photographic apparatus and material issued by the City Sale and Exchange, 81, Aldersgate-street, London, E.C. Copies will be sent free, on application, to any address in the United Kingdom. The catalogue is well produced.

ALMANAC Erratum.—The illustration to Mr. Tilfor's article "A Frame for showing Transparencies" was inadvertently misplaced from its proper position on page 786 to page 765, where it is included amongst the illustrations to Mr. J. H. Smith's article "Background Hanging without Creasing."

AT the last meeting of the South London Photographic Society the annual members' competition for slides from negatives taken on at least three of the Society's excursions during the past year was held, Mr. C. Churchill taking first place, and Mr. C. Churchill and Mr. F. W. Bannister (bracketed equal) taking second place.

ACCIDENT to Mr. E. J. Wall.—We are extremely sorry to learn of a serious accident that has befallen our friend and co-worker, Mr. E. J. Wall. On Friday last when engaged in attending to the machinery at the European Blair Films Co., Foots Cray, Mr. Wall was unfortunately caught by the moving parts, with the result of a broken leg and arm. The injured gentleman was promptly removed to the cottage hospital at Sidcup, and according to the latest news is progressing fairly. We are sure that the thousands of photographers in all parts of the world to whom Mr. Wall is known personally, or by reputation, will join us in wishing our injured friend a speedy and complete restoration to health.

"PHOTOPHIL" writes:—"Some one asks for Whitaker's photo stains. I apprehend they are but aniline solutions in water, or, in some cases, water and alcohol—not difficult to prepare substitutes. Some, however, differ (a red) from any I could prepare. I wanted them, and inquired some time ago, Fallowfield, quondam of the Marsh, Lambeth, used to sell them. I am still in search of a liquid, cheap, non-inflammable and non-absorbent of carbonic acid, for an invention relating to photography."

PATENT Law Amendment.—Sir Herbert Jekyll, replying to the memorial of the Associated Chambers of Commerce on the subject of the Amendment of the Patent Laws, says:—"I am directed by the Board of Trade to advert to your letter of the 16th October, addressed to the President, transmitting a copy of resolutions adopted by the Association of Chambers of Commerce of the United Kingdom, at its recent Conference at Nottingham, in favour of the amendment of the Patent Law in certain particulars, and in reply I am to say that Mr. Gerald Balfour has given instructions for the drafting of a Bill to give effect to the recommendations of Sir Edward Fry's Committee, and that his Majesty's Government will consider in due course whether the Bill shall be introduced next session." The Council have resolved to apply to the President of the Board of Trade to receive a deputation in support of the resolution adopted at the autumnal meeting.

SOCIETY of Arts.—Sir Henry Trueman Wood is to give the juvenile lectures at the Society of Arts this year, on "Photography and its Applications." The object of the lectures is to show how numerous and varied are the applications of photography to scientific and other purposes. The subject is an interesting and extensive one. It is not generally recognised to how great an extent eye observations, in every branch of scientific inquiry, are now superseded by photographs. Movements too rapid for the eye to follow can be photographed and examined in their successive stages; objects too faint to be perceived by human vision can be faithfully pictured by the camera; the successive stages of a phenomenon, lasting but a few minutes—like an eclipse—or even a fraction of a second—like the passage of a projectile—can be accurately pictured and examined at leisure; subjects too complicated, or too evanescent to be reproduced by the pencil, can be recorded in detail by the lens. In physics, astronomy, meteorology, spectroscopy, botany, microscopy, surgery, geology, mineralogy, engineering, surveying, and numerous other branches and science and of industry, photography has its special uses, and to the advance of all it has contributed.

AT the meeting of the Newcastle-on-Tyne and Northern Counties Photographic Association, held at the Y.M.C.A., Newcastle, December 10, Dr. Blacklock gave a demonstration on lens testing. The doctor's apparatus consisted of a baseboard with an inch scale down one side. At one end of the board a ground-glass screen was arranged to slide back and forwards. At the other end was a small lamp burning in front of a collimator. In the middle was a support for the lens to be tested, so arranged that it could swing on a pivot, and the angle of swing could be measured on a scale beneath. To find the nodes of the lens, it was rotated on the pivot until a spot was reached where the image of the cross wires did not move; the pivot was then in the position of the node of emission, the node of admission being found by reversing the position of the lens, and performing the operation over again. Back focus was got by measuring the distance between the ground glass and the back combination of the lens. To find the curvature of field, the lens was swung to the side again and the cross wires refocussed, when the difference between the two positions equalled the amount of curvature. Chromatic aberration was found by putting different coloured glasses between the collimator and the lens, or by focussing a piece of apparatus something like a windmill, but with the arms placed an inch behind each other. This must be done at a suitable distance, say, ten feet, and a plate exposed and developed, and if the arm focussed for is not the sharpest, the lens suffers from chromatic aberration. Astigmatism was examined for by comparing the sharpness of the cross lines when the lens was swung so as to bring them to near the edge of the field of view.

THE New Star in Perseus.—Professor Wolf writes from the Observatory at Heidelberg to say that he succeeded on November 17 in taking an excellent negative of the nebula round the new star in Perseus. It shows, he says, that great changes have occurred since it was photographed at the Yerkes Observatory on September 20. The nebula consisted essentially of single concentric envelopes, of irregular oval shape, and of more or less thick clouds, which are developed especially south and south-east of the new star. All these formations have changed, more or less, since August 23, when Professor Wolf took the first photograph. The outermost envelope, which is, perhaps, the brightest, and seems to form a nearly connected oval shell, is, according to Professor Wolf, especially striking. The Professor continues:—"It consists of minute bright and dark clouds, and it is possible to follow the path which they have described. On September 20 they had advanced very nearly half the distance which they covered from August 23 till November 17. This fact seems to show that their speed is decreasing. It is also interesting to notice that the motion of the clouds is not perpendicular to the surface of the oval shell, but almost exactly radial to the Nova." Professor Wolf says that, in the meantime, not only the form of the outer envelope, but also the shapes of the various minute clouds have undergone considerable changes. The motion of the southern portion of the shell amounted to somewhat more than one minute of angular distance, from August 23 to November 17. The very strongly developed portion exactly south-east of the Nova has moved a little more than one and a half minutes in a radial direction. The Professor says:—"One might, perhaps, be inclined to believe that the experiment of a world formation is being made here before our eyes, by means of a gas explosion caused by the penetration of the Nova."—"Standard," December 14, 1901.

Commercial & Legal Intelligence.

THE Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. L. Squire, Salisbury-road, Leicester, for his negative, "Ducks round a hayrick."

MESSRS. Talbot and Eamer write:—"On and after 7th December, 1901, our address will be Miral Works, Seel-street, Liverpool, where we have taken larger premises. We have laid down entirely new machinery, and shall be better able to cope with the increasing demand for the Miral hand camera."

KODAK, Ltd.—The directors have declared an interim dividend upon the company's Preference issue for the quarter ending December 31, 1901, at the rate of 6 per cent. per annum, and upon the Ordinary shares at the rate of 10 per cent. per annum for the same period, which dividends will be payable on or after the 1st proximo. They have further resolved that the transfer books be closed from the 13th to the 31st inst., both days inclusive.

THE earliest 1902 Calendar to reach us comes from the well-known trade printer and enlarger, Mr. S. Herbert Fry, 12, South-villas, Camden-square, N.W. Ever resourceful and daring, Mr. Fry makes his trade-mark a conspicuous centrepiece of the calendar. It is a silhouette of himself against a red background. We congratulate Mr. Fry in the original methods he adopts for making himself known to the photographic "man in the street."

THE "Gloucester Diary," issued by the Gloucester Railway Carriage and Wagon Co Ltd., Gloucester, includes a "Directors' Calendar" on pages 70 and 71, and a note on each day throughout the diary to enable the periodic recurrence of fixed engagements to be recorded, such as Board or Council meetings, fixed to be held, for example, on the second Tuesday in each month. Among the notes for visitors to Gloucester on pages 65 to 69, particulars are given respecting many features of interest, including the Severn "Bore," the Gloucester "Mop," and the "Festival of the Three Choirs," which is perhaps the oldest and most important annual musical meeting held in Great Britain (the Welsh Eisteddfodd alone excepted). This festival occurs in Worcester in September, 1902.

RE Frederick Joseph Seaman, lately trading at 5, Red Lion-square, Heanor, and 2, South-parade, Matlock, photographer.—The statement of affairs filed under this failure shows gross liabilities amounting to £283 7s. 3d., of which £228 19s. 1d. is expected to rank against the estate for dividend. The assets are estimated to produce £29 8s. 7d., thus leaving a deficiency of £199 10s. 6d. At the first meeting of creditors, held in Nottingham last week, the Official Receiver said the stock and fixtures, which the debtor had stated would realise £13, had only made something like £5, so that the book debts were the only assets that remain for the creditors. The bankrupt commenced business at Hucknall Torkard in 1897 with a capital of £11. In 1900 he executed a bill of sale, and at the time of the receiving order eight judgments were outstanding against him. Debtor alleged his failure to have been caused through insufficient profits to meet expenses. The estate was formally left in the hands of the Official Receiver.

THE Late Paris Exhibition Medals.—We have heard complaints from some of the exhibitors at the French Exhibition of 1900 that they have not yet received the medals or diplomas which were awarded them. This may explain the matter. The Paris correspondent of the "Standard," writing one day last week, says:—"In response to the numerous complaints which have been made by British and other exhibitors concerning the delay in receiving the medals and diplomas awarded them at the 1900 Exhibition, a semi-official Note has been sent to the Press. It appears that in all a total of sixty thousand medals have to be struck. The work, which requires considerable care, has been entrusted to the Paris Mint, who are turning out about a hundred and twenty-five per day. Some twenty thousand medals have been delivered, and it is hoped to complete the remaining forty thousand medals within forty weeks. It is pointed out that for the 1889 Exhibition the first medals were only distributed a year after it had closed, whereas the present distribution commenced last May—that is to say, seven months after the 1900 Exhibition had closed its doors. The delay in distributing the plaquettes and diplomas is also due to the fact that their production entails operations which necessitate great care and considerable time. It is hoped that the distributisn of the diplomas will be completed by April next."

OGDEN'S Latest.—Ogden's, Ltd., announce that they are now supplying to tobacconists throughout the country, albums which may be bought at 6d. each. These albums are specially made to hold 72 photographs, one of which will be found in each packet of their "Tab" cigarettes. Ogden's, Ltd., desire to present every month 100 of these completely filled albums to hospitals and other charitable institutions, and they will therefore purchase each month from the public, at the price of 10s. each, 100 albums completely filled with these photographs out of Ogden's "Tab" packets only. All the subjects must be different, with no duplicates. Albums may be sent in to Ogden's, Ltd., Advertising Department, Boundary-lane, Liverpool, in a perfectly clean and good condition. Albums must arrive on the last Monday in each month, starting July 29th. Ogden's intend to purchase these albums back from the public for twelve months only, from July 29, 1901, to July 28, 1902. Albums not purchased will be returned, and may be sent in the following month. All albums must be clean and must be accompanied by 3d. for return of same if not purchased. Sender's name and address must be clearly written inside of front cover. No album will be purchased from any employee of Messrs. Ogden's, Ltd., or from any one engaged in the tobacco trade, or from any one engaged, directly or indirectly, in the manufacture of these photographs. The names of the persons from whom albums are purchased will appear in the "Daily Mail." The decision of the directors must be accepted as final.

CHEMISTS and Poisons.—In a paper read at a meeting of the Forfarshire and District Chemists' Association on Wednesday, December 4, 1901, Mr. J. H. Thomson said:—"Nowadays, owing to the wide interpretation put upon the Pharmacy Act by the law courts and the energetic action of those responsible for its enforcement in the public interest, the wretchedness attributed to it has been transferred to people whose scoffing attitude has led them into the careless observance or open defiance of its provisions. Those seven Glasgow doctors who proudly thought themselves beyond its reach have found themselves in its clutches, and, after being subjected to the odium of a prosecution and the smart of a fine, they were compelled to bear the further ignominy of having to appear before the General Medical Council and humbly listen to its censures. We chemists are warned that while the sale of scheduled poisons by any but duly registered individuals is thus sternly discountenanced by the highest medical tribunal, pharmacists, no less than medical men, must be prepared to obey the strict letter of the law. We are reminded that the Pharmacy Act contains a clause which empowers the Privy Council to order the erasure from the register of those who offend. Our duty and safety, as well as our credit, therefore, lie in making ourselves thoroughly conversant with the legal requirements, and then applying ourselves to their scrupulous fulfilment. To freshen our memories and connect our knowledge, let us make an occasional and studious use of the Society's 'Calendar,' whose pages contain the Book of the Law on this subject. We, like the doctors, are responsible for the acts of our unqualified assistants. No sale by them is legal unless supervised by us. On that point the Society's solicitor, in denying the charge that the Pharmaceutical Society was acting in bad faith, told the Medical Council he could show there had been twenty-six prosecutions of chemists' unqualified assitants in Scotland. In cases of doubt which may arise, though not often, we are encouraged to apply for guidance to headquarters. But the safe rule for all who would avoid anxiety and vexation of spirit, as well as the risk of bringing discredit upon the calling, would seem to be to err rather on the side of excessive caution than to run the risk of doing too little in the way of compliance with the legal formalities. In the light of recent proceedings we would do well to arrange for uniformity of practice on several points. For instance, in the case of articles in the first part of Schedule A, the intending purchaser must be known to the seller, or, if unknown, must be introduced. Some people exercise a discretionary power here which the law does not allow. They think they know a person sufficiently if he or she has been an occasional visitor to the shop for some time. But it is not enough to be familiar with a person's features. We must know the person fully, perhaps well enough to be able to verify their signature. Does any one refuse to sell Easton's syrup, I wonder, to an unknown purchaser? As a preparation of strychnine it belongs to the first part of Schedule A, though it is a popular tonic, and is unlikely to be used with felonious intent. Its sale, however, must be safeguarded. Either we must make a proper entry in the poisons book or treat the sale as a dispensing transaction, and enter it in the prescription book. Further, there is the case of vermin killers containing strychnine. Chemists might come to an understanding as to the general practice to be followed with regard to these, and possibly other cases."—"Pharmaceutical Journal."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
24.....	Leeds Photo. Society	Yorkshire Photographic Union Lantern Slides.
24.....	Stonehouse	Lantern Night.
26.....	Oldham	Demonstration: *Enlarging on Bromide Paper.* J. Siddall and J. Fullalove.
27.....	Bognor	Demonstration: *Enlarging.* Dr. F. S. Tidcombe and J. B. Daubeney.
27.....	Croydon Microscopical	Photographic Conversational Meeting.
28.....	Borough Polytechnic.....	Seventh Annual Exhibition.

ROYAL PHOTOGRAPHIC SOCIETY.

ORDINARY Meeting. December 10,—Mr. Thomas R. Dallmeyer, F.R.A.S., President, in the chair.

NEW MEMBERS.

Nominations in favour of eight new members were read, and at a ballot eighteen candidates were elected members of the Society.

GENERAL BUSINESS.

The following were elected Auditors of the Society's accounts for the current year:—Mr. Frank E. Seary and Mr. W. E. Dunmore.

The President announced that the Council had admitted to affiliation the Leicester Working Men's College Photographic Association.

THE GENESIS OF TELEPHOTOGRAPHY.

Major-General J. Waterhouse, I.S.C., Vice-President of the Society, read a paper upon the above subject, in which, after referring to his previous paper on the early history of the camera-obscura, he proceeded, by reference to the works of several old philosophers in the Latin tongue, and with the help of diagrams therein, to show that the projection of enlarged images by the combination of negative with positive lenses was the subject of much close investigation, and was known some three hundred years ago. The foundation of our modern system of tele-photography was laid by Kepler in Problem cv. of his "Dioptrice," published in 1611, shortly after the Dutch or so-called Galilean telescope came into use. This fact was noticed in the earlier paper by the author above referred to, as was also Scheiner's application of the same principle of using a convex and concave lens for solar observation with his "helioscope." Started by Kepler and utilised and developed by many of the many eminent astronomers and mathematicians of the seventeenth and the early part of the eighteenth, centuries, the method of producing enlarged images on a screen, by the use of combination of positive and negative lenses, seems to have been lost sight of by later writers on optics until Porro revived it half a century ago for photographic work. It is, however, only within the last ten years that compound lens systems of the kind suitable for photography have been perfected and brought into practical use. On the question as to what this early work of Kepler and others had to do with photography, the author replies that the processes of evolution must always be interesting. The optical and electro-chemical actions of light upon which photography is based have existed from all time, and for some thousands of years have been the subject of speculation to philosophers struggling in the darkness of their limited knowledge. The paper then proceeds to detail the writings upon which it is based, and into which we cannot enter in this short account.

The President congratulated the lecturer upon his paper, which was a very valuable contribution to our knowledge of the history of the subject. He remembered at a lecture at the Society of Arts on the same subject that he (the speaker) was bold enough to say that the enlargement of an image due to the combination of positive and negative lenses was probably as old as the science of optics itself. If General Waterhouse had read or heard those words, and had simply traced the history of telephotography or its foundation to the early days of the science of optics, he would have deserved well of the Society, but he traced it back to the days before the science of optics existed, to the time when everything was based upon trial and error. There were many points in the sketches that were of particular interest as showing the keen observation of men without any real knowledge of the science of optics to work upon.

A vote of thanks was passed to General Waterhouse.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 12,—Mr. R. P. Drage in the chair.

A paper on "The Essentials for Success in Albumenised Paper Printing," by Mr. G. T. Harris, was, in his absence, read by the Secretary (pro tem.), Mr. T. E. Freshwater (see page 805).

The Chairman noticed that the lecturer appeared to agree with Mr. Haddon that too much washing was injurious to albumenised prints. As regards its present use there was no doubt that professionals as a body preferred to use albumenised paper, but not so the amateur, who seemed to think that nothing but the gelatino-chloride papers were of any use.

Mr. H. C. Rapson observed that no mention was made of mealiness as a fault of the albumen paper. He had seen prints that were spotted all over like measles, and remembered a long run of prints with three or four brands of paper that could not be kept clear of this defect. It was ultimately got over, but how he did not know.

Mr. A. Haddon referred to some prints instanced by the lecturer made thirty or forty years ago, and still as good as they originally were. He thought it would be proved beyond doubt, if the paper on which these prints were made were analysed, that there was much more silver to be reduced to the tonable condition than in the present-day papers. The paper that was used in former days was also probably prepared with pure albumen that had not been allowed to decompose before it was used for coating the paper. The two facts named conduced very much to permanence. At the same time it was impossible to see how albumen prints could be made as permanent as gelatine paper prints. There was always an appreciable quantity of silver in albumen prints that could not be removed, and this was the starting point of the yellowing of the high lights, and finally the reason for the disappearance of the image altogether. The yellowing was due to the action of atmospheric impurities on this remaining silver, and, when once the yellowing was started, it could not be arrested, time completing the ruin of the print. It was an interesting experiment to take the paper forming the high lights of a print on any albumenised paper, and prove that silver was still present. One could print on that piece of paper without any addition of silver. He described his experiments in proof of this. Albumenised paper was sensitised, and, keeping it in the dark with the exception of the light afforded by a gas-jet, in turn washed, fixed in 20 per cent. hypo, and washed again. Two pieces of paper from different sheets were taken, in order to get a mean or average, and by analysis were found to contain practically the same amount of silver. The presence of the silver was shown by submitting the paper—washed, fixed, and washed, as described—to the action of chlorine water. This decomposed the organic salt of silver in the paper, producing chloride of silver, which, in this form, was very insensitive, but the addition of some nitrite of potash so increased the sensitiveness that, exposed under a negative, the paper readily gave a visible image. The silver required for this image was in the paper, even after the fixing described, and the image was very vigorous. The question arose as to whether the image was in the pulp of the paper or in the albumen. To ascertain the facts, paper was taken and doubled under the negative, but the image always appeared on the albumen side, showing that the silver was in the albumen and not in the body of the paper. As regards mealiness, this was always ascribed to acid in the paper or some part of the manipulations. If before the toning, it must be acidity of the silver solution, but at any rate acidity at some stage of the proceedings. He was glad to see that short washing was advocated, as the speaker and Mr. Grundy had shown that a short washing was all that was necessary, and far better than long washing.

Mr. Freshwater said that he had always sensitised his own paper, and prints so made years ago were still in excellent condition. He found that if the print were toned to a brown stage the result was more permanent

than if toned to the purple stage, particularly if the prints be exposed to atmospheric changes.

Mr. J. S. Teape thought that the prevalence of blistering did more to check the use of albumenised paper than anything else. In his own practice he found that the use of salt entirely prevented blistering, but others who had tried the method did not all succeed. It was important in using albumenised paper to sensitise it according to the character of the negative. With the modern gelatine negative the albumen paper wanted a weak salting bath and a low sensitising bath. This precaution would permit one to make as fine a print on albumen as ever could be got on gelatine.

A vote of thanks was passed to Mr. Harris.

PHOTOGRAPHIC CLUB.

December 4,—Mr. W. R. Stretton in the chair.

Two new members were proposed for admission to the Club.

Mr. H. Snowden Ward gave a lecture on

Photography for the Press.

The subject was, he said, more or less before the public, but a good deal of misapprehension was apparent, and this acted detrimentally to the interests of those wishing to do illustration work and the interests of editors themselves. Most editors of illustrated papers and books were a good deal worried by those who submitted pictures unsolicited, and, then, pictures that were absolutely unsuited to the purpose. From the photographic point of view, the spread of the use of illustrations had had very serious effects as well as beneficial. The older publication work practised by photographers in the sale of cabinets, etc., of celebrities had been largely injured. Some publishers who used to do this purely photographic publishing had now to face a very diminished revenue from the same class of work; on the other hand, others were making profits larger by far than they used under the old system. The present state of affairs had been evolved in the usual way. When the half-tone process superseded wood blocks, and when it was unnecessary, on account of cost, to make one block illustrate several different events, as was the custom, it was felt that it would be better to have blocks that really represented what they purported to represent. In consequence, photographers were approached, and their help was solicited. At first photographers wanted no monetary return, the advertisement satisfying them, but in course of time the impression that it was injuring their publishing business was forced upon them, and they asked for fees, which was a reasonable demand. The Copyright Union was started, and photographers and proprietors of journals and books were educated to demand and make payment for the use of photographs. There was, however, a great tendency to charge fees that the editor did not consider reasonable, and a result of injudicious pressure in this direction was that many large publishing houses retained their own photographers to do their work instead of taking what already existed and offered. There were two classes of press photographer. The ordinary man to whom his press fees were simply an extra to his regular income; and the other, the man engaged largely or absolutely by the press, who undertakes work on commission, and does not charge fees for each right of reproduction, but so much for a series, giving the whole rights to the journal employing him. The first class was the one that formed Mr. Ward's chief centre of interest. The idea that free-lance work was a good thing was false. The amateur might engage in it with some success, but the man who hoped to make a living out of it was mistaken. It should be used only as a means of introducing one's name to the publishing houses. Only a specialist could get work by offering his services; no ordinary general worker often succeeded. Another mistake consistently made was that of omitting to consider the editors themselves. Many people thought that the public taste should be studied, but the correct thing was to study what the editor thought the public wanted. Newspapers were more easy to approach than the magazine or book publishers, although the latter paid better if one could wait for the money. In submitting work to the newspapers, etc., one should remember that they are a source of much publicity, not that the picture should be submitted without a fee being asked, but that one should aim for as much cash, and at the same time publicity, as possible. A man whose work and name appeared regularly in three or four papers of good standing stood far more chances of getting further commissions than the man whose name appeared irregularly in a dozen or more papers. Mr. Ward recommended specialising, as we have the brothers Kearton in photographing birds, etc. Anybody who wished to illustrate a work on this subject now would, without further thought, go to these brothers, whose work was so well known. Some papers stipulated that the work sent in should invariably be accompanied by descriptive matter, or the pictures should be so far a series and valuable that the editor may think it worth while to write round them. It was curious how many people laboured under the delusion that a colliery accident or a railway smash was suitable for illustration in a monthly magazine that appeared weeks after the event. There was a growing field for reproduction rights in the American papers, for, although no copyright law protected British work in the United States, it was a fact that the best of the American magazines were particular to pay anything in reason. They would pay three guineas for the rights of reproducing a portrait produced in England when occasion arose, and more if necessary; but if one insisted upon twenty guineas, they would reproduce the print and fall back upon their strictly legal position of refusing to pay anything. Work of permanent interest should be submitted to the magazines, but that of temporary interest should go to the newspapers. The latter, naturally, require things submitted to them very promptly. It was a great mistake to submit things late. In the case of Ruskin's death a good photographer, who had unique opportunities of doing an interesting series relating to the deceased, sent some sets of very fine work, properly ordered, and with titles and descriptive matter, to the most likely papers immediately his death was known. He was astounded to find, however, that these papers had no use for them, for, although they published vastly inferior work, perhaps, it had been received and prepared long in anticipation of the death. The biography was ready, and the moment the death was notified the whole went to press. Newspapers, etc., were speculating on the deaths of every important personage, as they saw the need more than any for prompt publication. Another point that should be borne in mind was the fact that editors often preferred completeness of series with indifferent technique to good pictures of a very miscellaneous and unconnected nature. He gave the preference to the man who could submit a complete series, because he disliked going to half a dozen men over one subject. For pet dogs, he would have sent to the late Thomas Fall; for zoological work, to Gambier Bolton; for all sorts of domestic animals, to Charles Reid. The work of the last gentleman was commenced years ago, largely for the pleasure it afforded him, and during the times he could absent himself from ordinary professional duties. Work that was taken as a hobby had since amply repaid him, for his collection was unique in its extent, and was continually being used in the illustrated papers. Prospective illustrators to the press should also bear in mind that even editors took holidays. Season was a great factor to success. When people were away, and times were slack, the editor took his holidays, leaving a sub. in charge with the magazine practically made up, and with orders to buy only in very important cases. Respecting fees, the subject was a difficult one. The editor paid no more than was necessary. One week a thing may have a fair value attached to it because there was little of interest occurring, but the next week may be full of events, and the value is proportionally less. The Copyright Union fee of 10s. 6d. was a minimum fee, not a maximum fee, and there was no fear that a paper would refuse a thing at double that if it were interesting. As a general rule, a 4×3 or under should fetch 10s. 6d., a 6×4 £1 1s., a half page or 9×7 three guineas, and a whole page five guineas and upwards. Portraits did not fetch such good prices as war pictures, of course, and three guineas for the former, full size of page, was a good return if acknowledgment is given. As regards magazines, however, the difficulty of estimating values was greater. Much depended on the "market," whether the editor wanted a thing or was indifferent. If he must have it, he will pay well for a thing, but if not there will be no fancy prices. As regards the prints, if the editor works up his prints before reproduction he prefers matt paper, but if the block is worked up he likes a glossy print.

Croydon Camera Club.—Mr. C. E. Kenneth Mees lectured on "Spark Photography" to his fellow-members on Wednesday, 11th inst. The subject proved a most interesting one. Armed with a powerful twelve-inch coil actuated by accumulators, a successful series of photographs was taken on Wratten's speed plates, illustrating radiating brush, root, and other forms of electrical discharge. No camera is needed to obtain the desired results, the sensitive plate being placed on a metallic surface connected to one pole of the secondary coil, the other pole being connected to a wire immediately over the dry plate, but not in contact. The current is then momentarily established, and a spark passes from the wire, impinges on the film, and radiates over it to the metallic support underneath, photographing itself in its passage. If the current is reversed the character of the image is influenced, as is also the case if the shape of the electrodes is varied. Mr. Mees then radiographed one of the hands of the Hon. Secretary. At the instance of the Vice-Chairman (Mr. L. Kough), a hearty vote of thanks was accorded Mr. Mees, and to Mr. D. P. Roberts, of North-end, Croydon, for lending the apparatus. Members' slides followed by Messrs. Costar, Dapples, and Gregory, the last-named showing some particularly fine flower and botanical studies.

Liverpool Amateur Photographic Association.—At the weekly meeting on Thursday, December 11, a discussion on photographic mounts was opened by Mr. C. F. Inston. Mr. Inston deprecated the slavish adherence to the orthodox sizes of mounts, his opinion being that each photograph should be considered and treated entirely on its own merits. Dealing with the tone, he considered that a mount possessing the dominant shade of the print harmonised better than one of a colour complementary to it. A simple form of making a plate-mark on the mounts was also shown, after which the discussion became open. Several members having given their views upon the subject, a very hearty vote of thanks was accorded to Mr. Inston for the information laid before the meeting.

Southampton Camera Club.—At the last fortnightly meeting a lantern slide competition took place, the subject being architecture. The entries were numerous, and some very good specimens were produced for criticism. The pair of winning slides were contributed by Mr. W. H. Trigg, being fine photographic reproductions, both connected with Winchester Cathedral, one being of the south aisle looking west and the other of the same aisle looking east from below the steps leading to the choir. The winner was awarded the usual certificate of merit issued by the Club. This was the first of a series of lantern slide competitions which are to take place during the winter, and for which a silver medal is offered by the Rev. E. C. Bennett, one of the Vice-Presidents of the Club, to the winner of most certificates.

FORTHCOMING EXHIBITIONS.

1901.

Dec. 20–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

,, 24–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.

1902.

February 13–15 ..... Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries: W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell Hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.

,, 15–Mar. 8 Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.

,, 19–26 ..... Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.

Patent News.

THE following applications for Patents were made between December 2 and December 7, 1901:—

CAMERAS.—No. 24,434. "Improvements in Cinematograph and other Cameras." THOMAS KNIGHT BARNARD.

COATING FILMS.—No. 24,469. "Improvements in coating Photographic Films and in Apparatus therefor." (Communicated by Actien-Gesellschaft für Anilin-Fabrikation, Germany.) CHARLES DENTON ABEL.

DEVELOPMENT.—No. 24,619. "Improvements in developing Photographic Pictures." (Communicated by the Farbenfabriken vormals Friedrich Bayer & Co., Germany.) HENRY EDWARD NEWTON.

PLATE BOXES.—No. 24,999.—"Improvements in or relating to Boxes or Holders for Photographic Plates." (Communicated by Paul Boucher.) ALFRED JULIUS BOULT.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BROWN AND SEPIA TONES ON COLD BATH PLATINUM PAPER.

To the EDITORS.

GENTLEMEN,—It is only the real enthusiastic worker of this beautiful process who can enjoy the splendid tones obtained with it. For some time I have worked successfully in getting brown tones with mercuric chloride with the following formula. To every ounce of developer (working solution) add one to four drachms of a 10 per cent. solution of mercuric chloride, wash well, and fix in the usual way. Prints can be dried and mounted at this stage, or toned in the following bath, which gives a fine sepia tint (of doubtful permanence):—

Potassium ferridcyanide	10 grains.
Uranium nitrate	60 grains.
Acetic acid	1 drachm.
Water	10 ounces.

Prints must be refixed in a weak acid bath, which should not be over the strength of

Acid	1 part.
Water	200 to 300 parts.

If it is used stronger the tone will fade away in the bath. In adding mercuric chloride to the developer, the more of it used the browner the tone and likewise the sepia tint. The worker himself must determine the quantity; in other words, suit his own taste. If this should catch the eyes of those gentlemen of the London and Provincial Photographic Association, I believe they will have the exact formula by which the prints they admired were produced. Ferridcyanide tends to reduce the deposit. Printing should be carried half a tint deeper to allow for reduction.—I am, yours, &c.,

T. KING.

December 12, 1901.

THE FOCUS OF A LENS.

To the EDITORS.

GENTLEMEN,—Briefly, the information Mr. Wilkinson seeks is as follows. The focal length of a single lens is measured from its optical centre. In a doublet, a corresponding optical centre has to be found, which may or may not be exactly midway between the front and the back lens. This variety of position is the cause of the error in the method, which is sufficiently exact for lenses whose components are more or less symmetrical. In my letter on page 799, "sky-line" is a misprint for "sky-plane," and "measurable" in the third paragraph, for "immeasurable."—I am, yours, &c.,

December 13, 1901.

J. DORMER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

H. Lowthian, 144, Freeman-street, Grimsby. *Photograph of Miss S. Stokirs.*

J. E. Huntingdon, Darnall Cottage, Darnall, Sheffield. *Photograph of waterfall.*

J. Porter, 80, Alexandra-road, Manchester. *Two photographs of the Hon. W. R. W. Peel.*

ADDRESS WANTED.—T. KING.—The address of Messrs. Dollond is Ludgate-hill, E.C.

ADDRESS WANTED.—H. WRAGG, of 45, Mesnes-street, Wigan, inquires for the address of the Readigraph Company.

EXPOSURE METERS.—W. R. EVANS writes: "I shall be glad if you can kindly inform me which is the best exposure meter for photography in the market now, also address of maker?"—In reply: Consult an article on the subject in the ALMANAC for 1901.

ADDRESS WANTED.—"METOL" writes: "Can you kindly oblige me with the address of the makers of the Beaufort incandescent light apparatus for taking portraits by artificial light?"—In reply: Write to Mr. J. W. Beaufort, Colmore-row, Birmingham.

THE PURCHASE OF EMULSION.—"W. L." writes: "I shall be greatly obliged if you can inform me where I can purchase a small quantity of rapid sensitive gelatine bromide emulsion, similar to that used by plate-manufacturers in coating dry plates?"—In reply: We cannot say, unless some of the plate-makers will supply you with some. But this we somewhat doubt. Better write them and ask the question.

BOOKS WANTED.—"W. E. M." writes: "Would you kindly inform me of some book or books which treat of the chemistry and physics of the dry plate? I have looked in vain for an advertisement of any such book. I want especially to understand the chemistry of development."—In reply: "Photography with Emulsions," by Abney, 3s.; "Instruction in Photography," by Abney, 6s., etc. On pages 682-3 of the ALMANAC just out you will find a list of the principal text-books on photography.

CHARGES.—"VERAX" writes: "Are these charges fair? We were commissioned to print from 29 negatives (12×10) three dozen copies of each, and to mount same as enclosed. We were also required to frame two dozen of the said copies in one inch oak and half-inch gilt slip. For the prints mounted as enclosed we charge 1s. 6d. each, and for the complete framed ones (including photo) charge 3s. 1d. We provide everything, the negatives being the property of customer. We were not asked for an estimate."—In reply: We should consider the charges very fair; certainly not too high. If anything, they are too low.

FORMULA WANTED.—H. M. writes: "Will you kindly give me a formula for purple tones for P.O.P., one with acetate?"—In reply: Purple tones, on gelatine papers, are not easily obtainable, or, indeed, on any paper without a very vigorous negative. More really depends upon the negative than the toning bath employed. All P.O.P. papers are not alike, and the bath that will give certain tones with one paper will not with another. We do not know the brand of paper you employ, but we should advise you to write to the makers of it—they may be able to tell you how to get purple tones upon it with an acetate bath.

PAPER ON PHOTOGRAPHY.—"GUILD" writes: "I have been asked to give a paper on 'Photography' at a guild meeting (Wesley Guild, not photographic). I would like to impress, as far as possible, the important improvements and advancements made in all directions in our profession. Kindly advise what books will give most general information on its history, dates, names, inventors, etc., etc., up-to-date?"—In reply: "The Evolution of Photography," by Werge; "The History of Photography," by Jerome Harrison; "Photography: Its History, Processes, Apparatus, and Materials," by A. Brothers; etc. A complete list of the principal text-books on photography is given on pages 682-3 of the ALMANAC for 1902, just published.

LANDLORD AND TENANT.—G. W. writes: "Your advice on the following will greatly oblige:—(A) the landlord has agreed to let me (B) the dwelling-house and garden for photographic business (with the exception of the front room, which is used by the landlord as his business shop, at the rent of £16 per year, payable quarterly. There is a suitable space on the front outside between the door and A's shop window for a photographic case, and A declines me to use it, and says it belongs to him. There is but little room on the other side of the door. What I want to know is whether the whole front outside belongs to me as occupying the whole of the house (with the exception of the front room), or whether the front belongs to A, as he says? There is nothing mentioned about front in the agreement."—In reply: It must depend upon your agreement with the landlord. If you only agreed for a portion of the house and the back garden, we cannot see that you are entitled to anything else.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 2173. Vol. XLVIII.—DECEMBER 27, 1901.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1902.

Edited by Thomas Bedding, F.R.P.S.

What Some Readers Think of the Book.

"A valuable present."

"I congratulate you on the Almanac. It is the best you have done."

"I have found more items of interest to index from it than in the case of any previous issue."

"I think it is a splendid compilation, or rather, achievement and compilation, for the original matter you have put in means a lot of work; indeed, the labour you have put in must be immense, and you are to be congratulated."

"I congratulate you on the good judgment you have displayed in compiling your comprehensive article on Tele-photography, and also the very valuable collection in the Epitome of Progress."

"Having somewhat recently taken up Tele-photography, you may be sure I was pleased to see your masterly résumé on the subject, which I have perused with the greatest pleasure. No need now to wander further afield for information, except, indeed, it be to Mr. Dallmeyer's treatise, which would be invaluable to a more advanced worker than myself."

*** The 1898, 1899, and 1900 editions of the Almanac (20,500 copies each) were sold out within a few months of publication.

*** The 1901 edition was disposed of in less than a fortnight.

*** The entire 1902 edition has already been sold right out, and no further orders can be executed.

EX CATHEDRA.

Colour and Motion. The production of photographs in the colours of Nature, as the phrase is understood by the man in the street, has, for the moment, lost its interest, to be revived, no doubt, when some audacious company-promoter sees his way to exploit another modification of the crystoleum process. The good work already accomplished, and now in progress towards perfecting the three-colour method of producing pictures, comes under another category altogether. The one is legitimate, the other bastard. But there is another field of work, in which, we understand, many inventors are scratching the surface of the ground, but have not yet reached the sub-soil, namely, the production of cinematograph films in colour. Coloured "animated pictures" have been exhibited again and again, but they have been tinted by hand with aniline dyes, and showed as many imperfections as might be expected under the circumstances. The bare thought of colouring by hand a series of pictures running up to thousands in number, and each covering the small space occupied by a postage stamp, is enough to take one's breath away. It is quite evident that, under such conditions, any idea of artistic colouring must be at once dismissed, nor need we be regarded as captious critics because we fail to appreciate such pictures as works of art. The experiments, which we understand are now in progress, and which aim at placing upon the market films which owe their tints to the tri-colour method,

are interesting, but we confess that we have little hope that they will succeed. The general trend of these experiments seems to be in the direction of producing on a sensitised ribbon of celluloid, negatives taken in association with a tri-colour revolving screen, so that pictures Nos. 1, 4, 7, etc., will be taken under the red, Nos. 2, 5, etc., under the green, and Nos. 3, 6, etc., under the violet; this order being maintained until the ribbon has run its length. A positive film would then be taken by contact in the usual manner, except that a suitable stain would be employed, each picture being treated with the complementary of the coloured screen used in the making of its negative. If such a series of pictures, red, yellow, and blue, in ever-recurring sequence were projected upon a lantern sheet with sufficient rapidity, persistence of vision would cause the various images to combine upon the retina, so as to mingle the tints and give a fair representation of the original. A weak line in the chain of construction is represented by the circumstance that if a figure or other object of compound colour were to move across the field of vision, its component tints would be separated, and become disagreeably apparent. But the chief difficulty of taking pictures in this manner is in the matter of securing an image under the red screen with the short exposure necessary to this class of work. Until this difficulty is surmounted, "animated photographs" must perforce, retain their black and white apparel.

* * *

The Fog Fiend. Possibly there are no subjects of his Majesty who are more adversely affected in their business by the occurrence of fog than are photographers. It is true that copying for process work and enlarging operations are now commonly carried out under the beneficent beams of the arc-light, for daylight under any circumstances cannot be depended upon. The light of the sun varies so much hour by hour, day by day, and season by season, that it is relegated to a back seat for that class of work. Still, there are hundreds of professional men who are, perforce, obliged to look to King Sol for the wherewithal to earn their daily bread, and to these at least the fog demon is a terrible infliction that they would very readily get rid of if they knew how. The ordinary white fog we can never hope to eliminate from our moist climate, and we must be prepared to encounter it in places where the atmosphere is of the purest. But the yellow and black varieties, which engulf our cities, towns, and manufacturing districts come under a different category. They are the direct result of coal-consumption, and make us regret that the edict promulgated in the reign of Elizabeth, which made the burning of mineral fuel a serious offence, is not still in force. It would be amusing, were it not sorrowful, to note how, at the beginning of every winter, meetings are held, speeches are made, and articles written, against the injury to health and property, and the general stoppage of commerce caused by fog. But little is done to remedy the evil. The dark days pass by, and the coming of spring and summer chases away their memory, until the season of yellowness and gloom again comes round, when more meetings are held and more articles written. Certain Acts of Parliament forbid manufacturers to hang out banners of smoke from their tall chimney-shafts, but for every chimney of this kind there are thousands of domestic smoke vents over which Parliament can never hope to exercise any control. We are, however, in hopes that an improvement will gradually be seen in a lessened murkiness of the atmosphere. The use of smokeless gas-stoves and cookers is becoming more general every day; the employment of the electric light progresses by leaps and bounds, and we may hope that some day the same wonderful force will supply heat to our factory furnaces, and will allow us to warm our dwellings and cook our food under new conditions. In the meantime, photographers must possess their souls in patience, and battle the fog fiend by the use of such artificial illuminants as happen to be within their reach.

* * *

Submarine Photography. A search through the back volumes of any photographic publication will show how often the subject of submarine photography has been broached. Such pictures have been described in print, and the writers have evidently borrowed much from their own imagination, and a little from the picturesque imaginings of Jules Verne, but the photographs have not been reproduced, save in the case of an American magazine, in which an illustrated article was once devoted to the subject. These pictures, as we remember them, were not encouraging, for they were most vague, and might easily have been mistaken for photographs taken in a wood on a very misty day. They were interesting curiosities, and that is all that can be said in their favour. We can understand that, under certain conditions, a photograph taken under water might be useful. Thus, in the case of a submerged wreck, the state of the hull with regard to injuries, and its position with regard to the rock or soil upon which it rested, might be of great importance with a view to salvage. But after all, information of this kind can be very readily ascertained by divers without photographic help, and we have never yet heard of the camera being applied to such a purpose. Moreover, although a diver with his heavily weighted gear can withstand the strong undercurrent which often races across the scene of a wreck, he would have great difficulty in dealing with photographic apparatus even at slack tide. A good swimmer almost invariably opens his eyes under water (we have heard it gravely asserted that the pressure of the water prevents the eyelids being raised), and such an one well knows that the range of vision is extremely limited. One can see sufficiently well to pick up a coin, and objects such as large stones, masses of weed, etc., are dimly discernible at a distance of five or six feet, but beyond this all is uncertain. On the other hand, very beautiful photographs of marine growths, zoophytes, and the like can be obtained in air by using a vertical camera above suitable pools in the rocks, provided that reflections from the surface of the water be avoided. Artificial marine aquaria can also be photographed with success. The sponge and shell gatherers of the Bahamas use a square box with a glass bottom, which they float on the surface of the sea so as to examine through it the rocks, etc., below water. We do not know whether a camera has ever been adapted to this contrivance. The experiment would be worth a trial, if any means could be found for keeping the apparatus still whilst exposure was made.

* * *

To Lecturers. It is a laudable fashion with many folk to make good resolutions at the beginning of a year or a season. But these good intentions do not always come to fruition, else the paving of a certain place,

which shall be nameless, would be of different material. May we express a hope that lecturers, during this lantern season, will resolve to carry out a certain detail of their duties which will greatly add to the comfort and good temper of their audiences. We have attended many lantern shows, generally as a duty, and seldom with any great pleasure to ourselves. Sometimes the gas has run short in the middle of the performance, and with grateful hearts we have sought our home an hour earlier than we anticipated. But that has been the fault of the operator, or the man who supplied a leaky cylinder. Sometimes the lime has insisted on crumbling away before the lecturer came to an end of his discourse. That, again, was not his fault. But when we find that the arrangement of the slides, or shall we say their disarrangement, necessitates such interpolated remarks as "Not that one, please; I want the one with the windmill in the corner," we feel as if we owe the lecturer something more than the conventional grudge. In a recent conversation with a well-known lantern operator we were told that it is quite the exception for a lecturer to mark his pictures in any systematic way. Sometimes the dots are at the top of the slide, sometimes at the bottom, and occasionally on the wrong side of the picture. This operator was lately acting for a terrible transgressor in this way, who had the coolness to blame the lanternist in public for his own mistakes. There is really no excuse for this kind of carelessness, for carelessness it is. Grooved boxes for lantern slides can now be obtained anywhere, and the lecturer owes it to his audience to go carefully through his pictures before the performance, and to see that they agree in number and order with the list or the MS. which he has on his lecture table. There is no gainsaying the fact that lantern lectures are not so popular as they used to be. In many mechanics' institutes, and similar places, where they were once common, they have given place to musical or more frivolous entertainments. We think that this is due, in great measure, to slipshod methods on the part of lecturers, as well as to the incompetence of many of them. Ready-made oxygen and ready-made lectures and slides have tempted many to attempt that for which they were never qualified.

* * *

London Seagulls. August is the month when most Londoners flock to the sea in search of health and change of scene, and later in the year the seagulls pay Londoners a return visit. Directly the first snap of cold weather occurs the gulls are found in large numbers, more especially in the neighbourhood of certain of the Thames bridges, where people with time on their hands go to feed them. Flocks of gulls can also generally be seen in the winter-time on the reservoirs of the water company at Pimlico, and on the ornamental water in St. James's Park. So tame are these beautiful birds of the air that they will fly within a few feet of the outstretched hand, provided that the hand holds food which happens to be attractive to them. Flocks of gulls can also often be seen at inland places diligently following the plough, in order to pick up the various tit-bits turned up by the ploughshare. Seagulls make beautiful pictures, and, a few years back, when the fashion trended that way—and we all know that there are fashions in photography as in everything else—many photographers took great pains in making studies of these birds. But, as far as we can gather, the metropolitan photographer has ignored all the opportunities which the birds constantly give him. The weather is, of course, partly responsible for this, for brilliant days are few and far between at the season when the gulls come to us; possibly, too, many photographers will maintain that gulls on the Thames, or in a London park, are birds out of their proper habitat, which should be avoided as rigidly as game out of season. There is some reason in this; but at the same time, as studies of birds on the wing, such pictures would be valuable, at least, to artists who have a bad habit of scamping such things. It has more than once been pointed out that the Japanese are the only artists who depict flying birds with their wings in the downward position. The artists of other countries, including our own, almost invariably draw birds in the air like the letter V; in other words, they have a stereotyped form for that which changes its form every moment. Photographs of our pretty visitors would do something towards correcting this tendency to use antiquated types, so far as seagulls are concerned.

COMBINING NEGATIVES.

In concluding an article on combination printing (see page 741 of the issue of November 22), we made reference to combining negatives. Now, in double printing the combination has to be made in each individual print, whether a small or large number be required. This involves considerable trouble, and some waste, at the hands of those who are not familiar with this class of work. The making of a combined negative, from two or more, involves more trouble, and requires a little more skill than is necessary in double printing; but, when once the negative is made, there is no more trouble in producing prints from it than from any other. Therefore it becomes a question as to whether it is best to take this little extra trouble and produce a combined negative in the first instance, or to make the combination in each separate print. If only two or three copies are required, then the more convenient way is to make them by double printing, but, if two or three dozen have to be produced, it will be obvious that the time and trouble involved in making a combined negative will be well spent, as then any one can produce the prints from it in half, or less, the time that would be necessary with double printing, and without risk of waste. Furthermore, if a very large number of copies are wanted, it is a very easy matter, when the combination is made, to duplicate the negative. In this way a large number of prints may be quickly obtained, which is often a great advantage in the case of pictures of only passing interest.

We shall now consider some of the methods of combining negatives. Here is one we have seen successfully practised when only a single figure has to be introduced into, say, a negative of a group. The film of the second negative is first stripped from the glass by any of the well-known methods, and it goes without saying that it must be thoroughly hardened beforehand, either with formaline or chrome alum, to prevent its expansion when removed from the plate. The figure is then neatly cut out and laid on the negative, in the place it is to occupy in the picture, and then traced round with a needle-point. That portion of the negative is then

carefully scraped away with a penknife, and the stripped film inserted in its place, and secured there with two or three small touches of gum. If the juncture is not quite complete, it must be made good with Indian ink or other colour. When there are several figures to be introduced this method becomes a little tedious, therefore it is better to make an entirely new negative. This procedure has the advantage that the original negatives then remain intact, inasmuch as the combination is made in the transparencies from which it is produced.

The first thing to do, in this case, is to make transparencies of the different negatives to be combined. These may be made by any method, but whichever is selected for the work, the transparencies must be as films. They may be printed by contact on dry-plates, and afterwards stripped from the glass, or they may be printed on celluloid films; or they may be made by the carbon process. By whatever process they are produced, it is obvious that they must all have the same printing density to obtain a satisfactory negative. Celluloid films will, no doubt, commend themselves to some as being the most convenient. In practice, however, it will be found that the celluloid is somewhat difficult to cut through, in the manner presently to be described, unless it be very thin. That objection, however, does not obtain with the stripped dry-plate film; but there is an objection to both these methods, in that the colour of the transparencies may not be the same in each, and, therefore, not have exactly the same printing value. It is for that reason that the carbon process is to be preferred, as with that the colour will be identical in each, and the printing density easily judged in the development.

We will now consider the procedure by that method, and will take, by way of example, say, a group of a family, some of the members of which cannot be present at the time it is taken, and their portraits have to be introduced afterwards. In taking the group, it should be arranged so as to admit of the absent ones' portraits to be introduced in the desired positions. These portraits must, of course, be taken on the same scale as those in the group, and posed to suit the positions they are to occupy in the finished picture. The different negatives having been secured, transparencies are next made from them, and we will suppose that the carbon process is the one selected for the purpose.

This is how we proceed. Glass plates are cleaned, and then treated with French chalk, or are waxed. They are then coated with thick enamel collodion, and, after that has well set, the plates are placed in water until the solvents are washed away. The exposed tissue is then squeegeed upon them, and developed in the ordinary way. When developed, and well drained, the transparencies are flowed over with a weak solution of gelatine; drained, and allowed to dry. They are then coated with enamel collodion, and again dried. When dry, they are stripped from the glass, and are then, while being very thin, convenient for handling. The reason for the coating of gelatine is to protect the first film of collodion, in the highest lights of the picture, from the solvent action of the second coating.

The transparencies being finished, the principal one is fastened securely by gum-paper round the edges to a glass plate. One of the others is then taken and superimposed upon it in the place it is to occupy, and held firmly while the outline of the figure or that portion that has to be introduced is cut round—cutting cleanly through both films at once—with a sharp penknife, and then removing the under piece. In this way the second film will fit accurately into the first one, where it should be secured to the glass with a few small touches of gum. The other figures are then dealt with in a similar way, and the combination transparency is then complete.

It only remains now to make a negative, or negatives, from it. Perhaps the best and simplest way is to print a carbon negative from it, or it may be copied in the camera on a dry-plate. Some, however, may prefer to make it by contact-printing on a dry-plate. In this case, however, the transparencies must be fixed on the glass the reverse way. In this article we have given sufficient details for combining negatives to enable anyone to adapt any of the methods described to his special requirements.

DR. LUPPO-CRAMER'S EXPERIMENTS CONCERNING THE LATENT IMAGE.

In August and September we published part of Dr. Lüppo-Cramer's treatise on the latent image, and next week we shall give a translation of the remainder of this valuable contribution to the literature of an important subject. It may be described as an attempt on the part of Dr. Lüppo-Cramer to solve the question at issue between the nascent silver theorists, represented by Dr. Abegg, on the one hand, and the sub-bromide theorists, represented by Dr. Eder, on the other. The controversy was initiated by the publication, in the "Archiv für Wissenschaftliche Photographie," of Dr. Abegg's paper on the nascent silver theory. That ill-fated periodical has deserved well of photography, if only for the revival of interest in a subject, the explanation of which had been permitted to rest far too long merely upon the slender evidence offered by those who are justly regarded as authorities in photographic science. The gauntlet thrown down by Dr. Abegg was picked up with alacrity by Dr. Eder, and for some months the battle raged furiously in the pages of the "Archiv" and the "Photographische Correspondenz." The early demise of the former periodical may perhaps have been due in a large measure to the result of the controversy.

In the portion of the paper published by us in August, Dr. Lüppo-Cramer described a series of experiments, which may be briefly summarised in the following manner. The chief argument in favour of the nascent silver theory was the contact experiment. It was found that silver wire placed in contact with an unexposed plate during development caused reduction at the point of contact. Dr. Eder gives this experiment in his "Handbuch," but in the course of the controversy abandoned it, and showed that the effect was due to pressure. The experiment has been repeated by Dr. Lüppo-Cramer in a different and more refined form. Taking the silver reduced from a Lippmann emulsion, which is in an extremely fine state of division, he mixed it with gelatino-bromide emulsion, and arranged a series of comparative tests. It was found that silver, even in this finely-divided state, did not promote development, as the plates only exhibited increase of density proportionate to the amount of added silver. The next step was to convert this finely-divided silver to sub-bromide, and ascertain the influence it might exert upon silver bromide. Sufficient bromine was added to satisfy the formula for sub-bromide of silver. Although it was

doubtful that all the silver had been converted to sub-bromide there was a presumption that some had been formed. The product was added to an emulsion, but it had no greater influence than the finely-divided metallic silver. As an argument in favour of the sub-bromide theory, the destruction of the latent image by bromine had been advanced by its supporters, but Dr. Lüppo-Cramer shows that it is valueless, as the treatment of a gelatine plate with a solution of bromine before exposure also prevents the formation of an image. Bromine, however, exerts a powerful tanning action upon the gelatine, and as this vitiates the value of the experiments, Dr. Lüppo-Cramer turned his attention to collodion. The result of dipping collodio-bromide plates in a solution of bromine was less conclusive. A weak solution only reduced the sensitiveness of a plate dipped before exposure, whilst the image was completely destroyed when the plate was exposed before being dipped. This fact, however, adds little to the support of the sub-bromide theory, as similar solutions will rapidly convert the silver in a collodion negative to silver bromide, and Dr. Eder grants that the nascent silver theory may be brought into harmony with it. Experiments were then made by preparing sub-bromide of silver and adding it to collodion emulsion. Development was found to be favoured in a very decided manner. The sub-bromide, in this instance, was prepared from silver obtained by reduction from silver nitrate, as it had been found difficult to reduce a Lippmann collodio-bromide emulsion with an alcoholic developer. Upon repetition of the experiment, it was thought desirable to ascertain the effect of adding to the emulsion the silver reduced from the nitrate. This disclosed the surprising fact that metallic silver had the same effect as sub-bromide. To eliminate the possibility of error, various developers were tried, but each gave the same result.

In combating the nascent silver theory, Dr. Eder contended that nitric acid did not destroy the latent image. Dr. Lüppo-Cramer points out that wet plates containing an excess of silver nitrate were used, and that experiments with collodio-bromide plates, free from excess of silver, prove that the latent image may be destroyed by nitric acid. In the translation we published on August 30, it will be seen how Dr. Lüppo-Cramer interpreted these experiments. Briefly stated, they dispose of both theories, and leave the ground clear for fresh investigation. It will be seen in the portion of the treatise which we now publish that Dr. Lüppo-Cramer has made a number of experiments with various oxidizing agents and substances with affinity for bromine. The former tend to destroy sensitiveness, and the latter to increase it. These substances appear to be physical in their action, and at the close of a lengthy argument, Dr. Lüppo-Cramer finds himself forced to the conclusion that the latent image is composed solely of silver bromide. He believes it to be in an unstable condition, and influenced by various substances in a manner favourable to the action of light, or the reverse. Actual reduction does not take place until the developer is used. It is, therefore, probable that sensitiveness is associated with a physical modification of silver bromide, and Dr. Lüppo-Cramer is of opinion that further investigation should be in that direction.

There are many other points in this highly-interesting paper, to which we should like to refer, but we think it preferable that they should be studied in the manner presented by the author.

A PHOTOGRAPHER'S BOOKS.

The careful keeping of a set of books is not an absolute essential to business success. But it is certain that a successful man is more successful from keeping books, and that many an unsuccessful one owes an extra length to his drop from not having done so. It is hard for a man who is afraid that the balance is on the wrong side to draw out a balance-sheet. He dreads the definiteness of figures. It is very human to go on hoping for the best, and equally so to postpone the evil day of reckoning. We would like to believe that amongst professional photographers the latter are as few and far between as the law of averages will allow. Between the successes and the failures there are very many hard-working men in a small way who just manage to make both ends meet. If inquiry were made, it would probably be found that amongst them accurate bookkeeping is at a discount. They would be greater gainers than they imagine if it were at a premium, or even at par. That is, if, in addition to keeping accurate accounts, they took the trouble to analyse them periodically, and acted upon the clear deductions to be drawn from the analysis. Figures are the only true means of proving the significance in gross of small leakages, apparently very trivial and hardly worth attention in the single instance. That they are worth looking into is proved by the undoubted fact that at least ninety-five per cent. of the commercial successes of this highly competitive age have been clearly due to working on such narrow margins of profit that a very small leak would immediately turn into loss.

Take a photographic case to illustrate the significance of a small leakage. Presuming an entry to have been made of the number of plates used in the six or twelve months, it looks big. The next natural question is, "Can it be reduced?" Looking more closely into the usual method of working, it may be found that there has been a decided liberality in duplicating or triplicating negatives with almost every sitter, so as "to be sure of a good result. The extra plate only costs 2d., and it is a pity to run the risk of failure for the sake of so little." If there be reasonable doubt of the first negative not being a success, it is, of course, but common wisdom to try a second. But in the majority of cases the doubt is due more to nervousness, or to an indecisive method of working, than anything else. If the single extra plate, at only 2d., were saved by the cultivation of more decision of mind, or care in working, it would halve the plate-bill of the year—to say nothing of halving that of the pyro, and the time spent in developing. Twelve half-plates a week run to £5 in the year, and most photographers could find, in or out of business, a use for a £5 note. The plate-bill may be all right, but it is a very perfect business indeed in which figures will not disclose some crack or other through which profits are oozing out. The gain in once setting out to find one is that others are looked for, and closer attention is given all round, with gratifying results at the close of the year. Even assuming that such care has been used that a man cannot reasonably see his way to spend less if he is not to cross the line at which his business would lose from a cheese-paring policy, an analysis of his business figures will show him the structure of his business, as a whole, for a year. He will find that profits are not distributed uniformly over all classes of work. He knows that already in the rough, it would pay

him to know it in detail. There may be, for instance, fifty per cent. more profit on his wedding groups than his studio cabinets. Naturally, he will begin to think of how he can best develop the most profitable section. He puts himself in the way of finding out who are about to get married, finds out what banns are being published, and so on. In short, whether it be wedding groups, babies, or tombstone inscriptions, he begins to think, deduce, arrange, and act—which means in other words, that he has gained a half of the essential elements of success.

Well-kept books mean a great saving in time and temper in looking up anything, such as the particulars of an account or an invoice. They also give a solid confidence to a man's thoughts and feelings. A profit of only £50 on the year's work is really far more satisfactory to the feelings, if shown in the hard reliability of figures, than the higher amount it is put at, as a rule, if a matter of rough guessing. There is not the slightest doubt that good bookkeeping is of the utmost value. It tends to make a good business better, and may even be the means of converting a poor business into a good one. There is very little trouble involved in it. But it certainly does mean regular and persistent small attention. It is of no use doing it by fits and starts, clearing off large arrears now and again. If the day-book were posted once a day, the first thing in the morning, all the better; but it should certainly never go beyond a week. There are few so busy that they could not devote a couple of hours a week to it. And, if against the collar of the inclinations at first, as the high value of the results was made clear, it would soon become a matter held indispensable, and also one of interest. There is no necessity, either, for any one who may not have gone in for it to be deterred by the impression that it is a highly elaborate business, requiring a good deal of knowledge. The main essential is simply keeping expenditure and receipts upon separate and opposite pages of a book, and its elaboration, placing the various classes of expenses and receipts in separate columns under their appropriate headings. This, with the final addition and subtraction, is surely no very hard or elaborate work.

There is a technical, or professional, side to the photographer's work that is really of more importance to him than the purely business one. The most expert and painstaking bookkeeper, if he cannot turn out a good picture will not make a success as a photographer. Assuming professional skill, a working combination of the two it is that makes the best man. But if system is of such high value upon the purely business side, it is equally so upon the other. The system upon this also might be advantageously expressed in a book. That is, technical facts gained by experience should be noted and indexed or ready reference wherever possible, instead of being merely laid up in the soft, elusive grasp of memory. The photographer, in other words, should keep a sort of technical day-book and ledger. There is no end of useful information that he could enter in them. In a year's time the records would make most interesting reading to himself. In five years' time—as, say, "Abstract of Five Years' Professional Working"—they might make a book that would be hailed with delight by all photographers, if not by the general public. We will be content with suggesting some of its possible matter. Exposures, studio and outdoor; and approximate times of printing in the different months; effects of temperature upon development; proportion of wrinkles best left untouched at the retouching desk; backgrounds, with reference to character and age. Or higher ground might be entered upon, such as the best way of interesting a mother, a baby, a boy, a girl; how to make a councillor look dignified, a girl sparkling, a business man capable. As it is, the knowledge and experience necessary for dealing with such matters are present in a more or less strong, and a more or less get-at-able, fashion. They would be far more easily available if systematised in a book. Entering up such a book ought soon to become most interesting work; and the fact of having a book needing entries would keep the writer ever upon the alert, as an observer, for material. The general added alertness would react as much to his business advantage in handling his customers as the result of his experiences embodied in his book, which he could refer to at any time, and at need.

PHOTOGRAPHY IN CHINA.

[Reprinted from "The American Annual of Photography."]

One of the marked differences between the Japanese and the Chinese is that of artistic taste. The Chinese are almost without the artistic conception. The Japanese are nothing if not artistic. Since the time of the ancient Greeks the world has never known a people so wholly given to art as are the Japanese. From the little boy and girl to the old man and woman, from the coolie to the king, and from the country village to the empire itself, all is art. Not so the Chinese. He is plain and practical. He has a plain, practical wife, and they have plain, practical babies. They dwell in a plain house, dress in rich, plain clothing, about which there are few, if any, lines of beauty. He shaves his head in a most unattractive way, and his wife smears her hair down about her ears, oblivious of the fact that nothing adds to, or takes from, the beauty of a woman so much as the combing of her hair. There is nothing about his house which would lead it to be adopted as a model by European or American architects, as has the Japanese. There is nothing to make it popular like that of Holland. He paints pictures—he has painted pictures and written books about painting for two thousand or more years, but no one ever heard of a good picture that has ever come from his brush. He carves out stone men and stone animals, but who can point out a great Chinese sculptor? His bed is a board or a brick; his table is square, with four legs on the four corners; and his chairs are instruments of torture (I am seated in one as I write), without the remotest conception of either comfort or beauty. Such, likewise, are the patterns of all his furniture.

From such a plain people we can scarcely expect much in the way of new conceptions in photography. He has learned to "run the camera," but it still remains with him a wan-yi-'rh—a plaything. If he takes up photography as a business, he makes a living by it, which, to a celestial, is nothing more than to "get through the day" (Kuo jih tze), and he does this in many cases, not by trying to do a large business, but by charging enormous prices. Once I went to the largest photographing establishment in Peking to secure pictures pertaining to the Imperial family and army officers. I found what I wanted, and, when I inquired the price, I discovered that his prices were sixty per cent. higher than those of Japanese photographers in the city, and seventy-five per cent. higher than the prices in Shanghai. In addition, his pictures, though on good paper and well enough done, lacked that artistic pose which only the Japanese understands in relation to the Oriental.

The Chinese features are not conducive to good profile portraits. His nose is too flat, his lips too thick, and his cue interferes with the curve at the base of the brain. His cheek-bones are too high to make a good three-quarters view, though I have a very decent picture of the great viceroy Liu K'un-i in this position, taken by a Shanghai photographer. Because of these difficulties, the Chinese

have fallen into the unartistic habit of photographing all their subjects in a full-front view.

As small a matter as the height of a chair may produce serious results in photography. An ordinary dining chair or drawing-room chair is seldom more than eighteen inches high, with a retreating back. The Chinese chair is three inches higher, and the back is perpendicular. In such a chair there is no possibility of anything but a straight, stiff position—hands on knees, legs spread apart, and a monotonous line extending from the middle of the forehead to a point between the feet. Such is the position usually assumed by Li Hung-chang, and I have pictures of K'ang Yu-wei, the reformer, both sitting and standing, in this position.

In the open ports, where progress is always most rapid, there is a tendency to change. Photographs may be had of women in profile, of groups of men in all kinds of positions, while the photographers are imitating the Japanese in colouring their work, if indeed they do not surpass them. Their colouring, however, is largely confined to portraits, while the best Japanese colour work is done on landscape.

Much of this change is due to the attempt to photograph theatrical performers in all their various attitudes, and to get as great a variety as possible of pictures of public prostitutes. These two classes are unconsciously influencing the art of photography, especially in such port cities as Shanghai; and thence it is carried to other parts of the country, and, with the peripatetic "camera fiend," we may hope in a few years to break down this monotony of position which in the Chinese mind is associated with dignity. I have already referred to the three-quarter pictures of Liu K'un-i; I have another of the great viceroy, Chang Chih-tung, which represents him sitting at his desk, as unconscious of a camera as though he were a Rockefeller or a Carnegie.

The Chinese photographer knows nothing about "posing his subject" and getting him to "look pleasant" or "smile a little." He knows but little about contrasts of lights and shadows, and he retouches every face much as a confectioner would a sugar-loaf—or shall we say he makes it into a "pudding-face." He insists upon having that ever-present centre-table, tea-cup, water-pipe, and pot of flowers beside every subject, or between them if there be two. I have a collection of fifty-three different pictures, just received from a photographer, and all but two have the pot of flowers in the centre.

Efforts, however, are being made to give variety to figures in groups. Some time since a young Chinese friend, whose face is one of the handsomest I have ever seen on a Chinaman, gave me a picture of himself dressed in foreign women's clothing, explaining that he and three of his companions had dressed in foreign style—two as women and two as men—and had gone for a carriage ride, after which they had "had their pictures taken." He was a sorry sight in this "devil's dress." Another wealthy business man presented me with a picture of himself and wife dressed as foreigners, and explained that the large photographing establishment of the great Book Street in Peking keeps foreign clothing on hand for the accommodation of those who wish to see themselves "in the garments of the West." It is unnecessary to say that I put the pictures in a drawer, and never allowed them to appear except when I expected a call from my friend who gave them to me.

Their efforts at landscape photography are little if any better than at portraits. To the ordinary observer their pictures are passable, but when we examine them carefully we find that they lack what, in a musician, we call delicacy of touch. Their pictures do not bring out the leaves and bark of the trees, the hair of the animals, the ruts and clods of the roads, or the bricks and tiles of the buildings, found even in the pictures of amateurs in the West. They are crude, imperfect, unfinished—like everything else Chinese, "pu ch'a shen mo," or "ch'a pu to," "not much out of the way," and it is to be feared that photography in China will follow the fate of everything else Chinese and always remain "ch'a pu to." The Chinese language ceased to change before it reached anything like perfection—so, also, did the compass, printing, gunpowder, paper, the umbrella, and a thousand other things originally discovered by the Chinese. A marked difference between the Chinese and Japanese is that the former can originate but cannot bring to any degree of perfection, while the latter, though not able to originate—for it is difficult to point to anything useful that originated in Japan—are able to adopt and carry to almost any degree of perfection, and this is largely because of the artistic or imaginative disposition of the people of the Island Empire, and the lack of it in the Middle Kingdom.

There is perhaps no uninvestigated portion of the world which opens up to the photographer, both professional and amateur, greater opportunities with less opposition than the Empire of China. The Chinese are fond of having their pictures taken, and they are willing to pay fair prices for good work. China is full of interesting relics of a civilisation antedating all others now in existence, which relics may contribute, when properly studied, much to our knowledge of the early history of the race. Nowhere do we find more curio dealers than in China, and a curio means anything from a piece of jade to a coin, an ink-stone, or a brick, there being volumes of literature on ancient tablets, and indeed on all kinds of ancient curios.

Add to these the topography of the country, its lofty mountains and deep valleys, its great forests of various kinds of trees, its vast plains, deep ravines, long rivers with all their scenery, beautiful lakes, and indeed all the varieties which help to make up a country having a climate similar to that of Europe and the United States, with a civilisation entirely unique, a civilisation which has extended uninterrupted through all the periods of Egypt, Assyria, Babylon, Greece, Rome, the Middle and Modern Ages of Europe, and is strong and vigorous at the present time.

I can go downtown now and for one cent purchase a piece of money which was in circulation in the time of Christ. I have on my desk a paper bill, $13\frac{1}{2} \times 8\frac{3}{4}$ inches in dimensions, found in an idol, a part of the currency of three hundred years ago. Books five or six hundred years old are comparatively recent; indeed, there is in all departments of art and science, and in all distinctively photographic lines, ample opportunities for both professional and amateur photographers. Fortunes will be made in these lines during the next quarter of a century as they have been during the past, and they will be made by those who first occupy the field. These most probably will be Japanese. They are nearest to the open door, awake to the opportunities, ready to seize them, and capable of using all the grist that comes to their mill.

There would be an especially good market for the wares of a man who could keep up with the times. The Chinese have not gotten beyond the ordinary printing papers of five years ago. A firm having an arrangement with a home establishment to furnish them with the latest product of the paper market would rapidly build up a trade beyond what could be done in a European or American city; for it is to be feared that, even if the Chinese were to fall in line in this, as in many other things, they would not be able to keep pace with the rapid progress of the West. ISAAC TAYLOR HEADLAND.

STEREOSCOPIC RELIEF IN SINGLE TRANSPARENCIES.

AT the last meeting of the Section of Photography and Microscopy of the Franklin Institute, Mr. F. E. Ives exhibited a method of producing stereoscopic effects without the use of a stereoscope, in explanation of which he said:—

"About sixteen years ago I was making that study of the dioptrics of half-tone screen photography which led me to devise and adopt the cross-line sealed screen and special diaphragm control, now universally employed in the production of half-tone process plates. At the same time, other applications of the line screen occurred to me which I did not regard as of sufficient importance to justify me in devoting time to exploiting. One of these applications was to the production of a stereogram which should require no stereoscope or other optical aid to be seen in relief, like the ordinary double stereogram in a stereoscope.

"It recently occurred to me that a very simple modification of my 'kromolinoskop' camera could enable me to produce such a stereogram, and that it might be of sufficient interest as a scientific novelty

to be worthy of presentation at a meeting of this Section of the Institute. The single example which I have found time to produce is in the form of a transparency on glass, which, when held twelve inches squarely in front of the eyes, instead of looking like a photograph, appears to be the front of a box, within which, in full stereoscopic relief, and at different distances from the eye, are a statuette and two glass vases.

"This result is obtained by placing a line screen in front of the sensitive plate in the camera, slightly separated from it, and forming the image with a three-and-a-half-inch diameter lens, behind which are two small apertures placed at the pupillary distance apart, and viewing the resulting photograph (a positive from the original negative) through a similar screen from approximately the same distance as the focal length of the lens.

"Each aperture of the lens forms an image made up of shaded lines, and, owing to difference of parallax, the lines constituting the two elements of the stereogram are separated and alternate with each other; and for the same reason each eye picks up all of the lines belonging to the respective element of the stereogram, while the lines constituting the other element are hidden from that eye by the opaque lines of the colouring screen.

"In the small example exhibited the lines of the screen are somewhat in evidence; but there is nothing to prevent the production of these pictures in such large sizes that at the proper viewing distance the lines cannot be separately perceived, and in such large sizes they would prove interesting, and might have some vogue as window transparencies and in the production of popular illusions, such, for instance, as a magical gallery of sculpture, the statues appearing to be of life size, and as if seen through and beyond a glass behind which there was in reality nothing but empty space. In order to give this kind of picture a distinctive name I propose to call them 'parallax stereograms.'"—"Philadelphia Times."

THE ARTS OF ENGRAVING.*

II.

I show you another plate, "Death and the Knight," in which the craftsmanship is if possible even more accurate. The engraving of the armour of the knight is probably one of the most perfect pieces of engraving ever executed. It is a most precious plate, and a joy to study for hours with a magnifying glass; but, taken as a whole, it is lacking in the grandeur which a subordination of detail and concentration of light would have given. I show you still another, because, although a much less important plate in some respects, it is, to my mind, one of Durer's most entirely satisfying engravings. It is so precise that a builder would have no difficuly in reproducing the house, plank for plank, but there is almost an entire lack of the hardness which one feels in some of his other plates. There is quite a feeling of atmosphere in it, a clear, pure atmosphere, such as we seldom see in this country certainly, and the distance recedes in quite a realistic fashion. Altogether this plate, which is only about seven inches high, is by far the most sensitive and delicately refined plate I have ever seen. The graver is not a sympathetic instrument like the etching needle, which glides over the copper tracing lines which one feels a sudden breath would blow away, and yet with this hard, uncompromising graver, which will only very slowly cut out one line at a time, and has to be pushed carefully round each curve, Durer has, in the distance seen through the doorway and in the detail of the gable, produced a poem in line quite as exquisite as even Rembrandt, the master of the etching needle, has done with his more sensitive instrument. Perhaps I ought to have stated, what you must already have inferred, that all Durer's engraved plates, unlike his woodcuts, were entirely the production of his own hand.

It will be quite impossible for me to follow the history of line engraving during the last four centuries. My excuse for speaking more fully of the early Italians and of Durer is, that they engraved original plates or reproductions of their own designs, while later the art became more of a skilled craft, which was used entirely for the purpose of reproducing other men's pictures.

During the seventeenth and eighteenth centuries there were a great number of marvellously skilled line-engravers to be found in all the countries of Europe, who carried the process to a state of mechanical perfection in the way of reproducing textures, tones, and chiaroscuro which was undreamt of by its earlier exponents. I show you now a print of German origin engraved by one Bause in Leipsic in 1793, which exhibits a perfect marvel of manual dexterity and human patience. Here, again, we have the reproduction of a very celebrated eighteenth-century line engraving by the engraver, J. G. Wille, who also was a German, but was trained in Paris, and worked in Paris. It is a most exquisite piece of work, and shows that Wille had lost most of his German character in his French training. You will notice a lightness and freedom, almost a feeling of playfulness, in the character of the line as compared with the more serious precision of the lines in the last plate I showed you. In our own country the art achieved distinction in the eighteenth century by the productions of Strange, Sharpe, and Woollett.

The first of these, Sir Robert Strange, was quite a picturesque character. He was born in Orkney in 1721, and was descended from an ancient Scottish house. When the Civil War broke out, he joined the forces of the Pretender, and while in his service he engraved a half-length portrait of the Prince. He could wield the sword as well as the graver, however, and took part in the battle of Culloden.

The works of Woollett are probably the best-known engravings of this period, and are very frequently to be met with still in old houses. They are chiefly reproductions of Sir Benjamin West's historical pictures, such as "The Death of General Wolff," "The Landing of Charles II."

These pictures contained a tremendous amount of detail and incident, with scores, possibly hundreds, of figures, and the production of a single plate generally occupied more than a year's constant labour. Woollett lived in London, near Rathbone-place, and when he had finished a plate, so joyous did he feel, that he celebrated the event by firing a cannon from the roof of his house. When he died, in 1785, a tablet was placed to his memory in Westminster Abbey, although his body was laid in the Old St. Pancras Burying Ground, where a satirical wag wrote the following inscription:—

"Here Woollett rests, expecting to be saved;
He graved well, but was not well engraved."

In the early part of this century a great deal of line engraving was done for wall pictures, and you must all be familiar with it. Here, for instance, is a line engraving of Mulready's picture of the wolf and the lamb, and this is very typical of this class of work. It exhibits a very considerable amount of capable draughtsmanship and mechanical skill, but does not rise to a very high level as a work of art. Here we have a finer piece of modern work. It is a reproduction of Van Dyck's celebrated picture of Charles I. in Dresden, and is a plate of very considerable richness and power. I show you still another to familiarise you with the character of the process. It is a fragment of one of Raphael's pictures.

In the earlier part of the century line engraving was also extensively used for the illustration of the finer and more expensive class of books.

Line engraving, like all the other intaglio processes of which I shall speak, presently, could never be freely used for book illustration, because of the inevitable slowness and consequent expense of printing. Woodcuts could be put in the printing press along with the type, and printed with equal ease and rapidity, but intaglio engravings had all to be printed by hand, one at a time, slowly. For each impression the ink had to be rubbed into the lines by hand, and then the surface had to be wiped clean by hand also, therefore the process could only be used for the illustration of volumes de luxe. But still there was a fairly extensive industry kept going in printing these plates. Much of this work was of a very mechanical order, but some of it reached a higher standard. I show you now a plate engraved by William Miller, after one of the vignettes which Turner drew for an edition of the Waverley Novels. It is a view of Abbotsford, and is an exceedingly dainty and delicate piece of work. But line engraving, like wood engraving, has fallen upon evil times. The two processes were discovered or invented at practically the same time, and after having enjoyed rude health together for more than 400 years, they have together come to the brink of the grave, if they have not entered it already. It is questionable whether there is now a single line engraver earning his living by the exercise of his craft. The laborious mechanical method has been rendered unnecessary by the development of the photographic processes, while artists who

* Concluded from page 809.

wish to express their ideas on copper prefer to do so by the more rapid and sympathetic methods of etching and mezzotint.

The next process on our list of intaglio engraving methods is stipple engraving. This process calls for very little remark, inasmuch as it is identical with line engraving, except that the engraver, instead of cutting continuous lines on the plate, cuts little circular holes or dots instead.

It was frequently used for the production of small book plates, particularly when the original to be copied was a pencil drawing.

I show you such a print now, and I trust you will be able at least to see that in the reproduction a very considerable likeness to the character of the pencil has been preserved. Stipple engraving was also very frequently employed to render the delicate tones on a plate which was otherwise engraved in line, such as in the portrait of Shelley, which I now show you. The stipple process received its greatest impetus in this country from the works and influence of Bartolozzi, an Italian engraver, who settled in London in 1764, and who was one of the original forty members of the Royal Academy. The aim of Bartolozzi and his school was essentially prettiness, and for this end stipple was a convenient medium. Prettiness is the quality which most readily attracts the attention of the superficial multitude, and Bartolozzi's works became very popular, but they by no means exhibited the greatest capabilities of the method. Much more serious and lasting work was accomplished by other engravers, and the climax was reached in the early part of the present century (i.e., I mean the nineteenth century), in the work of William Walker, a Scottish engraver, born in Musselburgh.

I show you on the screen a reproduction of his most celebrated stipple plate. It is a portrait of the Earl of Hopetoun, from a painting by Sir Henry Raeburn. Walker engraved this plate in response to a challenge from some mezzotint engravers that he could never make stipple equal mezzotint engraving in richness and colour. The result proved that it was possible to do so, but only by an infinitely greater expenditure of energy and perseverance and mechanical skill than would be necessary to produce an equally satisfactory result by the mezzotint process, a method in which Walker also became a celebrated worker.

Mezzotint might be described as a negative process, inasmuch as the engraver works out the whites of his plates instead of cutting out the darks. His procedure is first to get a perfectly polished plate of copper or steel, and then roughen the entire surface until it presents the appearance of a fine file, or something like the surface of a sheet of sandpaper. This is done by means of an instrument called a cradle or rocker. It consists of a steel blade, something like a joiner's chisel, but shorter and broader, and the edge instead of being straight, is slightly rounded. The edge, also, instead of being one continuous line, is broken up into numerous little points or teeth, measuring about sixty or one hundred to the inch. The rocker is held perpendicularly upon the surface of the plate, and, with a gentle pressure, is rocked to and fro, and the mezzotinter all the time pushing the rocker slightly from him, and the result is to produce a series of close zig-zags of dotted lines across the plate. This is repeated in parallel lines until the plate is covered. The engraver then turns the plate round and rocks across his first working, and goes over the entire surface of the plate in that direction. Then he goes over it diagonally, then across again, and so on in sixty or eighty different directions, and then there ought not to be a single speck of the surface which has not been indented and broken up by the teeth of the rocker. Great care must be expended in the preliminary process, as much of the subsequent perfection of the engraving depends on the evenness and regularity with which this monotonous work has been performed.

If the plate were now thoroughly covered with ink, and the excess wiped off the surface, it would be found to print a perfectly regular black all over, and the result would be almost as rich as the surface of a piece of black velvet.

On this plate the engraver produces his picture by scraping away the roughness on the portions which he wishes to print white, and the intermediate tones are obtained by partial scraping. The principal artistic quality of this method is its realisation of a deep velvety blackness not to be obtained by any other process, and there is also a delicious softness in the half-tones which is very delightful. It is, moreover, a method in which any accomplished artist may readily acquire sufficient proficiency to express himself, and is well adapted for the production of original work. It is a most delightful process to work, i.e., after the mechanical rocking has been accomplished the picture grows under the artist's hands in a most fascinating manner, and the plate itself is a pleasure to look upon. The process is of German origin. It was invented by Ludwig von Siegen, a Lieutenant-Colonel of Hesse-Cassel, about the year 1640. By him it was communicated to Prince Rupert, the grandson of James I., and he introduced it to England in 1660. It soon became very popular in this country, and its greatest exponents have been the British engravers of the eighteenth and nineteenth centuries.

The most eminent school of engravers in mezzotint were those who lived and worked at that interesting period of British art when Reynolds, Raeburn, Gainsborough, Hoppner, and Constable were painting their masterpieces, and most of the engraved works of these masters have been produced by this method. William Ward, Charles Turner, S. W. Reynolds, Valentine Green, William Walker, and David Lucas are among the more renowned of these engravers, and fine impressions of their works now command very high prices in the market, hundreds of pounds being frequently paid for prints which originally cost probably 30s. to 50s. Mezzotint is such an interesting process, and is so closely associated with the most interesting period of British art, that one could easily spend a whole evening, or series of evenings, in discussing its capabilities and the productions of its great exponents, but our time is limited, and we must pass on to yet another of the intaglio processes, probably the most fascinating of them all, viz., etching. Etching is the process which has always had the greatest attraction for the artist.

The mere method is easily learned, no special mechanical training is required, and the production of a plate is much more rapidly performed than in the case of the more precise processes which we have already spoken of. But in spite of the simplicity it is the process by which (in the hands of a master) the most exquisite black and white pictures have been produced. It is so sensitive and sympathetic that the most subtle working of the artist's mind may be made to appear in his work, but it is equally true that it requires an artist of great imagination and poetic instinct to produce an etching of real value.

The process simply is as follows:—A polished metal plate is procured generally of copper, and the surface is covered with what is called an etching ground. This ground is really a kind of soft varnish. There are many recipes for making it, and various methods of applying it. I shall not enter into details. What we require to understand is the principle that the surface must be covered with this varnish or ground so as to entirely protect it from the action of nitric or nitrous acid, which would otherwise corrode and eventually dissolve it entirely. This ground must be quite thin; it must not be in the least degree brittle, and it must be soft enough to be easily scratched. The etcher then proceeds to scratch his design or picture upon, or rather through it, with what is known as an etcher's needle, simply a sharp steel point: an ordinary darning needle fixed in a wooden handle makes an excellent tool. This may be done with great freedom and rapidity as compared with the tedious pushing of the graver. The only special care the etcher has to take is to make quite sure that his needle penetrates right through the ground to the surface of the plate, and lays it bare. For this purpose the ground is generally made of a black colour, so that the lines or scratches show readily on the bright surface of the copper if they have been properly made. The next process is to immerse the plate in a bath of acid, which corrodes or dissolves, or, as it is generally termed, "bites" away the copper where it has been exposed by the etching needle. In the course of, perhaps, ten minutes a groove will have been bitten under each line about the thickness of a fine hair, and the plate is taken out of the bath, washed, and dried. The etcher then paints over the more delicate portions of the plate a resist varnish, which will effectually protest these lines from further biting. When this has dried, the plate is again placed in the acid bath and subjected to a further biting, and this process may be repeated as often as necessary Some etchers, however, are content with the one biting operation, and trust to getting their different qualities of blackness of line by using needles varying in thickness at the points, and consequently making broader or narrower lines. There are many modifications of the method, but in all the principle is the same. What I am particularly anxious that you should realise is the freedom with which the etcher works. He holds the needle as he would do a pencil, and as the point is circular, and the surface of the plate perfectly smooth, there is no resistance or obstruction to the continuity or perfect curving of his line in any direction.

This is the technical character which is to be looked for in a fine etching. In none of the other graphic arts can so beautiful a line be produced. It may be thick and black and strong, or it may be

delicate almost as a spider's web. The most perfect line drawn on paper by pen and ink is exceedingly rough in comparison, and, in addition, it does not contain the body of ink, nor is any ink which can be used with a pen of so beautiful a quality as that with which etchings are printed. In the first place, then, we are to look for beauty of line in an etching, and after that we may look for beauty of composition and drawing, and all the other qualities which go to the making of a picture in black and white.

Etching has been described by a German poet-etcher as "Rambling on copper;" as "a wish, a sigh, comprised in finely chiselled odes;" as "painting upon copper with sting of wasp and velvet of the wings of butterfly;" "even so the etcher's needle, on its point doth catch what in the artist-poet's mind reality and fancy did create."

Line engraving was learned from the goldsmiths; etching was first used as a means of decoration by armourers. Durer etched a few plates, and it is a curious evidence of its origin that his etched plates were produced on iron. It had simply been adopted direct, and had not been developed in any way, and consequently Durer's etched plates are rough and coarse. They are valuable only because of their design, and do not exhibit any of the beauty of lines which is such a charm in his engraved plates. It was not till nearly a hundred years later, in the early part of the seventeenth century, that etching developed to its greatest perfection—in France, in the works of Jacques Callot, and in Holland in the work of the prince of etchers, Rembrandt.

Callot was a man of most mercurial temperament; he could never settle down to serious work, but in the lightest possible vein he produced little plates, joyous, frivolous nothings. He saw in art nothing more than a means of amusement, in the people about him only subjects for caricature, and in religious subjects only a pretext for grotesque invention, and yet he could execute his shallow ideas in such an exquisite manner that his works will be treasured for all time. The lightness and boldness of his touch, and the exquisite quality of his line, and the suggestion conveyed by the minimum of actual labour, had a great influence in proving the powers of this delightful process.

Then we must refer to Rembrandt, the master of all etchers. I show you a reproduction of his print of "Christ Healing the Sick," more generally known as the "Hundred Guilder Print." It is the most celebrated plate ever etched, and in it the student may find all that can be learned of etching. Those of you who are really interested in the subject, and who have not seen a copy of this marvellous plate, should not miss an opportunity of doing so, and studying it most carefully. In its finest state there are only about eight copies known, and these are all in public museums, two of them being in our National Museum, where any one may see them by applying at the Print Room. At times Rembrandt attacks the plate with great vigour, and again he skims over the surface and caresses it with an exquisite refinement so delicately that a magnifying glass is almost necessary to see the individual lines, and throughout there is most perfect drawing and characterisation in the varied class of figures who crowd the plate.

Then in later times we have the poor half-starved and eventually wholly mad French etcher, Charles Méryon, interpreting the architecture of Paris in severe straight lines, and yet in a completely original and poetic manner. And in our own country we have Whistler, whose airy fancy has perhaps shown its most subtle touches in this method of graphic art. But as my subject is really the processes of engraving, I cannot dwell longer on the works of these men.

The next method on my list, and the last of consequence, is dry-point etching or engraving. In this manner the subject or design is merely scratched on to the surface of the plate with a firm etching needle. There is no resist varnish and no acid biting. A sufficient pressure is brought to bear upon the needle to scratch or tear a line upon the surface of the copper, which will be deep enough to hold ink. I show you here a diagram to illustrate the various shapes of the line in engraving, etching, and dry-point.

Now, notice the difference. In the line engraving the line is a V-shape, and is entirely below the surface of the plate. In the etched line we have a circular hollow, rather bulging out below. It is also entirely below the surface of the plate, and when wiped clean will print a sharp, clean line; but after wiping the surface of the plate, etchers frequently subject it to a process called retrousse, i.e., by gently dragging a piece of loose soft muslin over the plate, a certain slight quantity of the ink is drawn out of the lines on to the plate on either side. This process gives a softness and richness to the plate, which is very delightful. But in the dry-point line, the copper which is torn out of the hollow, stands up in a sharp ridge on the edge of the incision, and prevents the surface of the plate being wiped clean.

The result is to produce a very soft line, which is also extremely rich and velvety. It is a most charming method, but only a very few prints (perhaps a dozen) can be taken from each plate, as the ridge of protruding copper or burr, as it is called, is soon worn away by the wiping of the ink from the surface. It does not admit of the same freedom in drawing as the etching, because of the obstruction of the metal. The needle is all the time clogged by the tearing of the copper, and sudden curves are extremely difficult to produce satisfactorily.

The character of the result is quite unique, however. No other form of line engraving will produce the magnificent, rich, and soft line which renders prints by this method very readily recognised. The method was known and practised by many of the old engravers, either alone or along with other methods. Rembrandt used it very frequently for the finer shading lines on his highly finished plates, and the value of these prints is estimated in a great measure from the amount of burr to be found on his lines.

Before closing I must just say a word regarding lithography, not because it is really a part of my subject, but rather to emphasise the fact that it has nothing to do with engraving, and to point out the difference. A lithograph is drawn upon the surface of a smooth porous stone of very fine texture or grain with an ink which contains fat or grease of some kind. The stone is then thoroughly damped, and an ink roller charged with fatty ink is passed over it, with the result that the ink will not adhere to the wet stone, but does adhere to the greasy lines. A sheet of paper is then superimposed, pressure applied, and a print obtained. The print is therefore taken from the surface, and the quantity of ink transferred is very small, and consequently there is none of the resulting richness which we find in an engraving. Neither is the same sharpness and beauty of line possible which we find in a woodcut or etched plate. The line is always more or less broken and ragged, if carefully examined, and really need not for a moment be confounded with the quality of line produced by any of the engraving processes.

J. Craig Annan.

EXHIBITION OF THE WORK OF HENRY STEVENS.

Without opening address or ceremony of any kind, the exhibition of the work of Henry Stevens, constituting the first house exhibition of the Royal Photographic Society of the present session, was displayed on the walls of the Society's rooms on Tuesday evening, December 17, there to remain for some weeks.

To those who are able to recall to memory the Society's exhibitions in the eighties, and the first few years of the next decade, the present exhibition will bring pleasing reminiscences of a period anterior to the birth of pictorial photography in the modern acceptation of the term. Mr. Stevens can in no sense be considered to have followed the present prevailing fashion; but time has its revenge, and in viewing the collection which has now been brought together, one cannot avoid the impression that, admirable though much of the work of to-day may be, there is something wanting in it which was not wanting in the work of Robinson, Gale, Stevens, and some few other photographers of the past generation. That a "one man show" is an ordeal that few can pass through without more or less damage is becoming a platitude. Certainly in most of the previous exhibitions of the kind held by the Society the result has been that the exhibitor has managed to emphasise the weak points of his work rather than to show his strength and the soundness of his methods. Probably the most incisive lesson of these exhibitions has been the demonstration of the fact that it is given to very few indeed to review their own work with impartiality, and to exercise a discriminating sense of proportion when it is their own productions they have under adjudication. There have been exceptions, of course, and undoubtedly the present exhibition is one of them. Mr. Stevens has never indulged in very high flights of fancy, and he has not spread his work over a great variety of subjects. Flowers, domestic animals, and portraits have constituted the work of his camera, and his departures from the usual lines have apparently been few, and not very far. The most remarkable feature of his work is its technical perfection. His photography is almost transcendentally perfect. One remembers the feeling of wonder which an old acquaintance among the collection excited on its first appearance many years ago. The same picture excites the same feeling to-day. In spite of the vast improvements in photographic material, and the extended knowledge in procedure; in spite of the admonitions we have received

as to what not to do in viewing a picture, one cannot help the same thoughts arising and the same marvelling at the patience and skill which must have been exercised in its production.

As we have indicated, Mr. Stevens has not a wide variety of subjects, and his treatment is characteristically uniform. There is, therefore, not much to be said on either of these points. The pictures were not titled on the opening night, but really the subjects are so obvious that it seems unnecessary, though we are practically debarred by this omission from calling attention to any particular frames. Flower subjects have been so constantly associated with Mr. Stevens's name that they will probably first attract attention. In spite of the somewhat formal arrangement which is characteristic of the author's work in this direction, they will bear comparison with anything that has been yet attempted, especially if the size of the plate employed be considered. Small pictures of equal merit are not uncommon, but a 15×12 or a 12×10 plate requires something much more than ordinary skill to produce. Next in interest are the pictures in which the smaller domestic animals are pourtrayed. Cats, dogs, rabbits, etc., are not the most tractable of sitters to the photographer, but Mr. Stevens seems to have the faculty of exercising his will with the happiest results. In portraiture, Mr. Stevens is perhaps less individualistic. Here he sometimes indulges in soft definition, which brings him more into line with the usual thing of to-day. Many of his portraits and figure studies are distinctly successful from every point of view.

In conclusion we congratulate the Society upon an exhibition which undoubtedly will be a popular one, and one which should do an immense amount of good in removing a false impression that seems to be abroad that slipshod photography suffices for modern-day requirements.

THE TRANSITIONAL ELEMENTS IN PHOTOGRAPHY.

[Read before the Photographic Club, December 11, 1901.]

The uses of iron in photography are, upon due consideration, very much more extensive than would appear at first; and, if we regard iron, nickel, and cobalt in with the platinum family, as the family of the transitional elements, a comparison of their properties, uses, and possibilities should have a certain amount of interest for the photographic chemist. There is little doubt that iridium, osmium, rhodium, and ruthenium, would be applicable to iron printing in a similar way to the employment of platinum and palladium, the expense of their respective salts at present standing in the way of investigation in this respect. It is important to notice that, analytically, iron and chromium are classed together, as where similar precipitations are brought about by similar re-agents with a class of metals, their affection by light is, as a rule, comparable. It is also interesting to find that platinum ores generally contain palladium, and chrome iron ore, for here are four of the metals occurring naturally together, whose relation in sensitive preparations is similar; thus we can in every case substitute for a platinum salt the corresponding salt of palladium; both platinum and palladium may be used with iron (i.e., with ferric salts); and chromic and ferric salts are alike decomposed by light.

The naturally occurring flattened-grain ores of platinum are heated with hydrochloric acid, which dissolves out the base metals; nitric acid is then added, forming aqua regia, in which the ore is heated in retorts; here palladium, rhodium, platinum, and iridium are dissolved as chlorides; most of the osmium (if any be present) distils over as osmic acid; the rest remains undissolved with iridium, as does any chrome iron ore. The neutralised solution is treated with mercuric cyanide, this precipitating the palladium; and the platinum is precipitated with ammonium or potassium chloride, as the double salt with which we are familiar.

We see platinum mentioned as early as 1859, in the "Photographic News," where an account of M. de Caranya's experiments is given. He uses this metal for toning ordinary salted paper, giving the following formula:—Water, 2000 grammes; chloride of platinum, about the density of syrup, 1 c. c.; hydrochloric acid, 30 grammes. The prints are recommended to be much over-printed, as they lose largely in the toning process.

You will notice that M. de Caranya employs platinum chloride of about the density of syrup. It is curious to notice that on the same page of this issue of the "Photographic News," a letter to the Editor is published, asking for further particulars of the Raspberry Syrup Process, and enclosing two prints done by the Raspberry Syrup Process. Could any gentleman present explain later on what this process is? It seems to me, that if Raspberry Syrup can be both a thirst-quencher and a sensitising agent, it is an excellent re-agent to have in one's dark room, especially if a supply of soda water be kept in stock also.

In the "Photographic News" of 1860—two years later—(page 104), a paragraph headed "Palladium" is given; the title is either entirely irrelevant, or a sad misprint has occurred. I merely quote word for word, as follows:—

"Palladium.—A brilliant metal, intermediate in colour between silver and platinum. Its density is 11.8. It melts in the strongest heat of the forge, and in the flame of the oxy-hydrogen blow-pipe. It is ductile and malleable. It does not combine directly with oxygen, but may be oxidised by indirect means. Protochloride of platinum has been employed for darkening negatives, but it appears to be only a colouring; the image is not intensified."

Such were the earlier ideas of the utility of the transitional elements; whereas, now we have toned with iridium, platinum, and palladium, and printed also by means of the two latter.

According to F. W. Cox, the platinotype process was invented by W. Willis, jun., and one or two papers that Mr. Willis read at different photographic societies were published in The British Journal of Photography about 1887 and 1888. Next, particulars of Captain Pizzighelli's "new" platinotype paper are committed to the same Journal, in which process the image is quite visible, and does not need development. I think, however, that it was rather a weak policy to suggest, in conclusion of the article, that if any development were required, a solution of soda was recommended as a good solvent. Steinbach paper was sized with a mixture of gum arabic and arrowroot. The sensitising solution was a mixture of ferric oxalate, ammonium, or sodium oxalate, and a 1 to 6 platinum solution, with ammonium ferrous oxalate. According to Pizzighelli, ammonium oxalate gives bluer tones, sodium oxalate browner.

An interesting use of platinum is with ordinary salted or albumenised paper, in which the silver print is practically converted into a platinum print. This was mentioned in 1889 by Lyonel Clark. Ordinary salted paper is printed in the usual way, and thoroughly washed to free it of silver; it is then brushed over with a solution of chloro-platinite of potassium, potassium oxalate, and potassium phosphate. This, states the author, gives a "platinum-black" print, which has finally to be fixed with sodium thiosulphate. There is a considerable reduction in detail and in half tone, so that prints have to be a good deal over-exposed. Application of mercuric chloride does not bleach the image; hence it may be assumed that it is entirely coated with platinum, and therefore probably permanent.

As regards the modern toning baths in which platinum is substituted for gold, one of the first, and one which I believe will be the last, as far as general excellence is concerned, is that due to Liesegang:—Chloro-platinite, ½ grain; water, 1 ounce; nitric acid, 2 minims. For toning bromide prints, E. J. Wall advises platinum tetrachloride, and this works better, probably because it is more easily ionised in solution, and such a state of affairs seems to be necessary for success with silver bromide. The many modern platinum baths, in which lactic acid, nphenylene diamine, etc., are used may have their good points; but, as I have before stated, I do not think that Liesegang's formula can be improved upon.

Now that the platinum hot bath process has been pretty well superceded by the cold bath, and after one or two severe lessons the world is beginning to learn that a print-out platinum paper is not a thing of the present, but of the remote future, we may regard platinotype as one of the finest of our means of printing, and perhaps second only to carbon. As you are, of course, aware there are now several methods of intensification, of local colouring, etc. The following plan of intensification was mentioned in "Photography" during 1900:—"Ordinary platinum prints may be intensified with pyro developing solution, to each ounce of which eight minims of a 10 per cent. solution of silver nitrate have been added. The prints, after intensification, are to be fixed in hypo.

We will now leave platinum and proceed to the date about 1896, when palladium was first made any real use of. A palladio-platino paper was suggested in The British Journal of Photography, 1897, p. 520, in which an iron solution, i.e., a solution of ferric and potassium oxalate was mixed with solutions of potassium chloro-platinite, and potassium chloro-palladite (or palladio-chloride of potassium, as the contributor preferred to call it). Gum arabic was the carrier employed. The paper must be absolutely dry during printing, more precaution being necessary than with ordinary platinum paper. The image is printed out till the details are visible, and is further developed by subjection to steam. Now, whether palladium is actually necessary in this process remains to be proved. It has been suggested as probable by some, and claimed, I think, by others, that the action of the palladium salt takes no real part in the formation of the image, but merely produces a physically different deposition of platinum. Palladium salts can, of course, be used to produce sepia images in platinotype paper, and this seems to indicate the same thing. In order to compare the two metals in as fair a manner as possible I made up two kinds of paper, having the following formulæ:—

1. Platinum Paper.—Arrowroot; chloro-platinite of potassium, 5 grains; ferric oxalate, 12 grains; potassium oxalate, 5 grains; water, 4 drachms.

2. Palladium Paper.—Arrowroot, palladium chloride, ferric oxalate, potassium oxalate, water.

With the main exception that the palladium paper took rather longer to print, and was more easily affected by moisture, very little difference was apparent either in the colour of the image or in the

amount of intensification that was observed on subsequent treatment with cold potassium oxalate solution. Hence I have said earlier that palladium and platinum are interchangeable in printing processes. But please let me observe that the formulæ I have quoted were made up offhand merely for experimental purposes, and are not given as types of ideal preparations; such formulæ have more than once been misinterpreted, and taken as excellent working formulæ, and have consequently led to needless correspondence in the photographic press.

Dr. J. Joé, who has done much good work in connection with palladium toning, says that sepia tones in general are obtained; that the prints after toning do not lose so much in fixing as they do when toned with iridium. In this case, as seems natural, if a strong bath be employed, black tones will result. An advantage of palladium as a toning agent, which may be put side by side with the chief objection to its employment—its expense—is that a quantity will tone many more prints than the same quantity of gold. Hence, probably, the distribution of the metal is finer.

The formulæ given by Joé are worthy of notice. The first is very like that frequently recommended for platinum:—Salt, 10 grammes; citric acid, 10 grammes; water, 2 litres; potassium palladio-chloride (another variety of the name), 1 gramme. For chocolate-brown tones the quantity of water is increased to 2½ litres, 10 grammes of ammonium molybdate are substituted for the 10 grammes of sodium chloride.

To proceed now to the three metals, iron, nickel, and cobalt, we may notice, firstly, that their atomic weights are all about the same, and their appearance is much the same; they are all magnetic, and their comparable electro-chemical equivalents are fairly equal. A good deal has been done with cobalt and iron, but the sensibility of nickel salts does not seem to be easily detected. Nickel is farther removed, as regards its properties, from iron than cobalt, and more nearly resembles copper in many ways, and the absence of many nickelic salts renders reduction by light out of the question. I will merely quote here part of a paragraph termed "Nickel Light" that appeared last year in THE BRITISH JOURNAL OF PHOTOGRAPHY. It was understood that $NiSO_4.7H_2O$, nickel sulphate, was acted on by light. According to Dobroserdoff, it is not. The crystals are decomposed with or without light, falling into another state of hydration.

Messrs. Lumière's process of cobalt printing was published in, I think, 1893. The advantages claimed were:—(1) extreme cheapness; (2) the short time required for washing the prints; (3) the absence of toning; (4) the quick rate at which printing took place; and (5) the great permanency ("great permanency" seems rather a peculiar term, but "permanence" is unfortunately only a relative word in photography.) The paper must be used as soon as it is dry.

Cobaltic hydroxide is made by sodium peroxide and cobalt sulphate. This is dissolved in oxalic acid, and applied to gelatine-sized paper. The image on exposure to sunlight is of a pale rose colour; development with potassium ferricyanide gives a deep rose-coloured print, which may be toned with ammonium sulphide.

Cobaltic oxalate appears to be the most suitable salt for printing with this metal; the emerald green may be solution applied to paper, and a pale pink image obtained, bright direct sunshine giving the best results. The image is fearlessly stated, as a rule, to be cobaltous oxalate. Whether this be the case or not is not certain. Cobaltic ferrocyanide gives a pale green image; the ferricyanide a purple print on very prolonged exposure; the chromate is apparently insensitive.

The use of iron in photography is more varied than that of any other of the metals under consideration. It yet forms the best developer for bromide paper and slow bromide emulsions, in the form of ferrous oxalate; it is used for toning bromide prints, and in combination with platinum and palladium for sensitising paper. It is used alone in the many iron processes such as the ferro-prussiate, ferrogallic, etc., and in crysotype paper its use dates back to the early days of photography. Perhaps the latest direction in which it has been put forward is as a reducer, and I think it was Mr. Lambert who called our attention to the ferric sulphate reducer some time ago. It must be remembered also that the metal iron figures as an important factor in potassium ferricyanide—one of the most useful reagents in the dark room. As a reagent in chromium and uranium printing processes it is also important. Another use, which I cannot quite grasp, is mentioned in the "Technochemical Receipt Book" of 1887. Under the heading of "Sutton's New Developer," we read:—"Dissolve 8 parts of sulphate of iron in 16 parts of water, and in another vessel 4 parts of sugar in 3 parts of water. When all are dissolved mix the two solutions, boil and filter the mixture, and allow the salt to crystallise. This produces a more vigorous developer than ordinary sulphate of iron." In the same book we have also the following extraordinary formula:—"Saturated solution of sulphate of iron and radical vinegar, each 30 parts; water, 360 parts. For white drapery and photographs of children, use it somewhat more concentrated." As a "set-off" against this, I will mention another developer, occurring on the same page. "Developer.—Water, 240 parts; radical vinegar, 30 parts; bromide of potassium, ¼ part; pyrogallic acid, 2 teaspoonfuls to each eight ounces of solution."

The printing processes in which iron is employed are too widely known to make it of interest to go into details. One method, however, which does not seem to receive much attention, was mentioned early in 1899 in the "Photographische Correspondenz." Paper is sized with arrowroot, and brushed over with mercuric chloride and ammonio citrate of iron. A brown image is formed on exposure upon a greenish ground. Immersion in water leaves the pale brown image. For the sensitising solution Valenta recommends:—Water, 200 grammes; ammonium citrate of iron, 40 grammes; citric acid, 4 grammes; and alcohol, 100 c. c.; mercuric chloride, 24 grammes. A good brown print can be obtained by developing a uranium-nitrate image with a solution of ferrous sulphate.

As regards the time-worn ferrous oxalate developer, which so many have given up for the less messy and more convenient agents, such as amidol, "imogen" sulphite, etc., a very good formula appeared in Lancaster's little book on "How to Become a Successful Photographer." The usual proportions of iron and oxalate were used, and as many drops of sulphuric acid mixed with them as there were ounces of developer.

For the working qualities of ferrous sulphate alone, as suggested by the invaluable "Technochemical Receipt Book," I should not care to vouch.

T. THORNE BAKER.

"S.C.P."—THE WELLINGTON SLOW CONTACT PAPER.

[Abstract of a Lecture delivered before the Kingston-on-Thames Photographic Society.]

THIS is a paper made, as you are no doubt by this time aware, by the firm of Wellington and Ward, of Elstree, and it is in reality a very slow bromide paper; in fact, one of the class that have become known as "gaslight" papers. Of these we have many different brands, each issued, however, with the addition of the words, "gaslight" or "no dark room required" to the trade names under which they are sold. My own pet name for them is "Fireside Printers." The directions for use are as simple as it is possible to make them, and, whilst the results will hold their own with any bromide prints that have yet been made, or at any rate that have been brought to my notice—and I may say that I see a good many in the course of a week—the working is so simple that either the professional or the raw beginner, the man who uses nothing less than a 15×12 camera, or the boy who uses the Brownie or the Little Nipper, can both obtain equally good prints. The developer recommended is a mixture of metol and hydroquinine, but I have with success used ortol, adurol, and pyro. The fixing bath, as given, is one of plain hypo. And this, you will notice, is going away from all the laws previously laid down for the fireside printers; in all cases an acid fixer has been recommended. I personally always use an acid bath, and I may say I shall continue to do so. All the work I shall pass round to-night has been fixed in an acid bath, except the prints done at the factory, where were, I think, fixed in the plain hypo bath, as per directions. These were sent on to save time, and give me a larger selection of results. Now when I speak of an acid, I do not intend to convey to you the idea that I mean one containing alum; far from it, a mixture of alum and hypo I do not believe in, and will not use. I give you, with pleasure, the formula I use, which is:—

Water	20 ounces.
Soda sulphite	4 ..
Acid acetic glacial	½ ounce.

Dissolve the sulphite, add the acid, and shake well. Add 1 ounce of the solution thus obtained to each pint of fixing bath of 2 or 4 ounces of hypo to 20 of water—the former for ordinary bromide work, the latter for plates and the paper under consideration, "S.C.P." This, I think, is the best acid fixing bath one can use; at any rate, it answers perfectly in my hands. I may add that the formula is due to Wellington and Ward, and is intended for their ordinary bromide paper. It does its work well and clean.

The instructions issued with "S.C.P.," which, by the way, is made in two grades, glossy and a very nice smooth matt, are these: The packet must be opened in gaslight or very subdued daylight, and the paper placed in the printing frame a few feet distance from the source of light. The exposure, with an average negative, at say, 6 inches from an ordinary fishtail gasburner, is from one to three minutes; if diffused daylight, from three to six seconds should prove sufficient. The developer is made as follows:—

Water	10 ounces.
Metol	10 grains.
Hydroquinone	30 ,,
Soda sulphite (crystals)	350 ..
Soda carbonate (crystals)	350 ,,
Potassium bromide	5 ..

Dissolve in the order given, and each salt should be completely dissolved before the next is added. Using the developer at full strength as given, fine blue-black tones are obtained. If even softer results are required, they may be obtained by giving an exposure of one-and-a-half to twice what I may term the normal one, and adding an equal quantity of water to the developer. By the way, the developer will keep indefinitely in well-stoppered bottles. When development is

complete, rinse for a second or two, and transfer to the fixing bath, which should be one of 4 ounces of hypo to 20 of water, and may have the acid solution added, if you prefer an acid bath; but this is optional. Fixing is complete in from five to ten minutes. The usual washing must, of course, follow. For the development of small prints the printed sheet should be placed in a clean dish, and the developer flowed over it evenly and at one clean sweep. In using large sizes it is, I think, better to soak the paper for a few seconds in water before applying the developer. Care should in any case be taken to see that it is completely covered with solution and air-bells should be avoided. I am to-night using a developer made up as just described. "S.C.P." prints may be toned with the usual bromide toning baths, but to my mind it is a mistake to so tone them, as no matter what tone you produce you cannot, I think, go one better than a good black and white, such as "S.C.P." gives, and I would ask, "Have we a toning method for bromide work that can be called permanent?" I think not. If, however, you must and will have brown tones by toning, then I think the alum-hypo process is as good as any we at present know.

The prints I now hand you for your inspection are some done by the firm, and I do not think it is needful for me to say any words of praise about them. In any case, they will not get any. I prefer that they speak for themselves, which I think they will do in no very weak voice. These are my own work: some are daylight exposures, some gas, and some lamplight. These are also my own making, and I want you to notice most particularly the warm colour of them, ranging from a warm black to a sepia. They were given the normal exposure, and developed with pyro-soda developer, made to the formula I now give you.

No. 1.

Water	5	ounces.
Pyro	15	grains.

No. 2.

Water	5	ounces.
Soda sulphite (crystals)	½	ounce.
Soda carbonate (crystals)	½	ounce.
Potassium bromide	5	grains.

For use, equal parts are taken. When mixed it should be allowed to stand for some minutes to oxidise in order to produce the warmer tones, and the older the mixed developer, within reason, the warmer will be the colour. Used at once it gives black tones.

ERNEST HUMAN.

PHOTOGRAPHY MADE EASY.

IF there be one feature more than another especially noticeable in connection with the practice of photography during the last ten years, it has been the endeavours of manufacturers and inventors to produce apparatus and material that may be said to reduce to a minimum the trouble not only of taking a negative but likewise the printing of it. Hand cameras may be said to have completely revolutionised amateur photography, for even those workers who possess large-sized cameras are now seldom seen employing them, everything seems to be running in the direction of snap-shot exposures, from our school boys and girls to paterfamilias himself. Ten years ago no one would have believed it possible that such a revolution could take place, or that photography could have been made so easy of accomplishment as it is at the present moment. Primarily, no doubt, this is traceable to the wholesale manufacture and small cost of the modern dry plate; for few grudge the nominal charge of one shilling for a dozen quarter plates, whilst exposing machines—for many of them can hardly be termed cameras—are obtainable at a cost of from four shillings and sixpence to ten and sixpence and one guinea, prices which, in truth have brought snap-shot photography within the reach of every intelligent person, and now it looks as if we were within measurable distance of further radical changes which are to reduce still further any little difficulties that may have remained, in the shape of development, printing, and toning of negatives, for cameras, or machines, have been designed which not only expose a sensitive plate, but turn it out as a developed negative. This, in point of fact, has already become "un fait accompli," and the system only requires further extension to place it practically within the scope of the tens of thousands who now derive pleasure from the practice of photography.

No doubt there are, and always will be, a certain remnant of workers whose chief delight lies in carrying out personally the intricacies and niceties connected with development, and the numerous chemical reactions which give rise to pleasurable excitement in the production of a photograph. On the other hand, it has been clearly demonstrated that had the practice of photography, or, more correctly speaking, the mere act of exposing a plate, and the procuring of a photograph from such, not been made so easy of accomplishment, there would never have been the vast numbers seen taking an interest in photography as is the case at the present time. What a truly mighty change has been wrought in all this, when compared with the slavery of preparing one's own chemicals and materials, fifty years ago. And yet there are those still living who can look back with no slight amount of satisfaction and delight to what to them was nothing less than a revelation by studying the reactions and chemical changes, their own hands and brain brought about. A pleasure and satisfaction that no one who merely purchases a camera and sensitive material, leaving all the rest to be done for him by his dealer, can ever appreciate or experience. Photography, especially during the last ten years, has been indeed made easy, and the manufacturers of photographic apparatus and material have not been slow to cater for the dilettante, whilst dealers have lent their aid and given free instructions in what little was necessary to "press a button and make an exposure." To such an extent has this been carried that it would now appear as if this very "ease of production" is going to react upon those who gave birth to the idea. For to the manufacturers who have striven to cater more particularly for the amateur worker, and have at considerable expense lain down plants for the production of some special class of apparatus or material, may suddenly find themselves face to face with some startling departure in apparatus or material as to throw their productions quite out of date. Such a contingency is not pleasant to contemplate, especially in the face of such striking novelties in apparatus and radical changes in material which we have recently seen thrown upon the market. Such a contingency becomes also a matter of moment to the poor professional who has already suffered so much at the hands of unscrupulous amateur workers and dealers during the last fifteen or twenty years. The question, however, so far as the professional is concerned is difficult to answer, for it may be that the outcome of the adoption by non-professional workers of the small-sized pictures so popular at present, will work a reaction in his favour so far as commercial and household photography is concerned and eventually prove a benefit, where at one time it was conjectured as likely to militate against his interests.

The first step towards photography being made so easy was taken by those manufacturers who catered for the tyro, or the "You touch the button, and we do the rest" class of workers, for the mysteries of developing, printing, and toning were quite beyond such individuals, and they had no desire to be instructed in such. Others, again, having experienced the pleasure of witnessing a few successful results, were found inquiring somewhat after the mode of printing and toning their negatives. The printing has always been looked upon as a matter of the utmost simplicity, it has always been the toning of amateur prints that has given trouble and tended to drive into the hands of dealers a large amount of work which otherwise could have been easily performed by the tyro himself. And the latest development in photography being made easy is the production of a class of printing papers that require no toning where silver printing is performed, and in the case of platinum, no development by chemical means, as hitherto necessary. It must be obvious that if anything like equal results in permanency and appearance can be obtained with such radical changes as these in the production of prints from negatives, a vast number of those workers who have hitherto stumbled over the toning of their prints, and as a consequence given their negatives to a dealer to print and tone, will before very long be found performing the work themselves from the standpoint of economy alone. Self-toning printing papers as recently placed upon the market open up a new field which must in the near future work a great change with some manufacturers and dealers, and, seeing that at least some of these new printing mediums are produced by means of collodio-chloride, the probability is that, so far as permanency is concerned, they are much preferable to prints by means of gelatino-chloride. The mere placing of a print direct from the printing frame into a fixing bath of hypo is in reality such a simple and easy operation as to make it difficult to see how, for a large run of non-special work, such can fail to become widely adopted, especially as by ringing the changes in the hypo a variety of colour can be obtained. Then, again, with platinum, the newest departure is the development of the printed proof by means of hot water only, striking examples of which are now being shown by several of our leading dealers. Truly there is no end to the changes in photography, and it may be well asked, "What next in the way of ease of production?"

A. T. NEWTON.

Our Editorial Table.

MESSRS. Fuerst Brothers have sent us a sample of their new neutral gold toning and fixing salt "Goldaxe." The salt is sent out in one shilling tubes, each sufficient to make thirty-two ounces of solution The salt is in the form of a powder, is simply mixed with water, and is then ready for use. We have tried the bath with different kinds of gelatine papers, and find it works satisfactorily. The toning action is somewhat slower than with some "combined baths." This is an

advantage, inasmuch as there is the greater assurance that the prints are fixed before they arrive at the desired tones, even when they are of the warmer shades, which is not the case with some of the acid combined baths. The tones yielded with this salt vary from warm red-brown to rich purple-browns. This new salt should be a convenience to those who employ "combined baths."

The "Kristal" Transparency Plates.

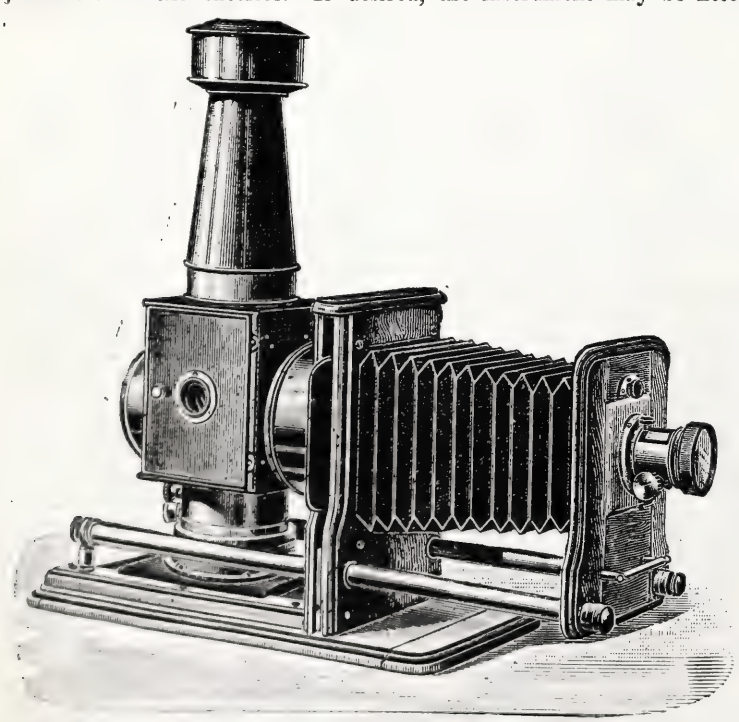
Manufactured and sold by B. J. Edwards and Co., Ealing, London, W.

Admirers of stereographic transparencies, and the great number of photographers who practise binocular work with the camera, will thank Messrs. Edwards for the introduction of this plate. Its special characteristic is this, that inasmuch as the glass is coated with a "matted" emulsion, the necessity in binding up the transparency of backing it with a ground glass surface is removed; a plain cover-glass answers just as well. In a practical trial of the plates we produced results with which we were highly pleased. Using a vigorous collodion negative made forty years ago by one of the most skilful stereographers of last century, and exposing the "Kristal" plate in contact with a gas flame at a distance of twelve inches for three minutes, the image on development with the special solution supplied to us appeared by reflection of a wet plate character, and by transmission of a rich purple colour. The "Kristal" plates, in short, are easy to work; by variation of exposure and development a wide range of colour is obtainable in them, and the exquisite matt effect imparted to them renders them, as we have pointed out, peculiarly adapted to stereoscopic work. Their introduction to the market is opportune, as we are witnessing one of those recurring spasms of interest in stereography which from time to time manifest themselves. Our readers should write to Messrs. Edwards for full lists and instructions for using the "Kristal" plates.

Rayment's Perfected Cantilever Enlarger.

Arthur Rayment, 125, Earlham-grove, Forest Gate, London.

The photographic enlarger represented below has been designed and constructed with much care and thought. The apparatus includes the necessary adjuncts and movements requisite for the professional or amateur worker who desires to attain good results, namely, a compound condensing lens (two plano-convex lenses), mounted in brass cylinders; a Petzval projection lens, giving good definition, and fitted with rack and pinion adjustment and non-actinic glass cap; a paraffin oil lamp, with circular burner, giving a powerful light, adjustable from the exterior. If desired, the instrument may be fitted



with either incandescent gas burner or incandescent electric burner. The light is fixed upon a sliding base, so that it may be retired from or advanced near to the condenser. The chimney and the lamp chamber are made of Russian iron. A door is provided having sight-hole for observing the light. Opening the door uncovers a sheet of ruby glass arranged so as to shed a non-actinic light amply sufficient for the operator to work by. The tube which overlaps the mount of the condenser is of polished brass, as is also the cylindrical tube at the back of the lamp chamber; the last-mentioned tube contains a polished metal reflector. The extension of bellows almost equals double the diameter of the negative intended to be enlarged, thus permitting the use of lenses of either short or long focus, and enabling reduced as well as enlarged pictures to be produced. The lens or front board is furnished with a horizontal sliding adjustment. The telescopic extension tubes and all other brass parts or fittings are highly finished and polished, so that the enlarger presents a decidedly handsome appearance. It is made of various sizes suitable for negatives of the well-known and popular sizes.

News and Notes.

The Rôntgen Society.—At the ordinary general meeting on Thursday, January 2, 1902, at 20, Hanover-square, papers will be read by Mr. C. E. S. Phillips, "On the Function of an Auxiliary Electrode in X Ray Bulbs;" and by Mr. Prosper H. Marsden, F.C.S., "On Radiography applied to Dental Surgery." After which Mr. H. W. Cox will demonstrate a new method he has devised for exciting several tubes simultaneously from one coil.

The Brownie Kodak Exhibition.—Messrs. Kodak have made arrangements to exhibit the competing prints sent in to the Brownie Competition at their Knightsbridge branch, 59, Brompton-road, London, S.W., from December 23 unil March 31 1902. This period will include the Christmas and New Year holiday season, and will thus enable many of our London and provincial friends to inspect the exhibition. As a very large number of entries have been received, an interesting collection of work by photographers of sixteen years of age and under will be on view. The judges in the Brownie Kodak Competition will be Messrs. Andrew Pringle and F. M. Sutcliffe, and their awards will be made known on the opening day. Prints for return of which no application is made will, at the close of the exhibition, be distributed amongst the various hospitals for children.

The Croydon Camera Club's fifth Exhibition will be held at the Art Galleries, Park-lane, Croydon, from Wednesday, February 19, to Wednesday, February 26, 1902. The Art Galleries (three minutes from East and New Croydon Stations) have been specially constructed for the display of pictures. They are well lit with a top light, and pictures hung are seen at their best. Last year's Exhibition was attended by upwards of one thousand visitors. The judges are Messrs. Chas. Job, Ralph W. Robinson, and J. B. B. Wellington. The following are the open classes: —(F) Landscape, seascape, and river scenery; (G) Portraiture, figure studies, animals, and still-life; (H) Architecture (exterior and interior); (I) Any subject, open to amateur photographers resident in the Borough of Croydon; (J) Lantern Slides—sets of six slides to be sent in. Silver and bronze medals will be offered. Class K (no entrance fee): Pictorial post-cards. Foreign entries invited. A silver medal is offered for the best set of four pictorial post-cards. Class L (no entrance fee): Pictorial post-cards. A bronze medal will be awarded for the best single card. Special award: A gold medal will be given to the best picture in the Exhibition irrespective of class. A silver medal is offered for the best trade exhibit. Entry forms and further particulars can be obtained from the Exhibition Secretary, Mr. W. H. Rogers, 46, Bensham Manor-road, Thornton Heath.

Sir William Abney, K.C.B., recently opened the new science buildings in connection with Watford Endowed Schools. The new rooms comprise a lecture room, a physics laboratory, museum and balance room, a preparation room and a dark room, which, with the chemical laboratory (28 feet by 24 feet), erected in 1892, form a serviceable set of rooms, specially designed for science teaching. The cost of the additions has been about £2000, and the sum previously expended on science buildings about £1000. In the course of his remarks at the opening ceremony, Sir William Abney said he did not wish any of them to think that, whilst they in the secondary branch of the Board of Education encouraged science in every possible way, they discouraged the other branches of education which were given at the same time. One of the reasons for starting the schools of science on their present basis was to insure that any boy or girl going through a course of science should at the same time be educated in literary work, which was so necessary in education. Of course, there was a great deal of difference between mere instruction and education. The utilitarianism of education was of minor importance; the great thing was education itself. If they could make the instruction that was given useful so much the better. In the old days the only possible means of education was by literary work, classics, and so on. There was no science, and therefore they could not say that a boy or girl was to be educated in scientific methods· but he was certain those who founded schools like those at Watford were so alive to the necessity of education that they would be equally alive to the necessity of education in modern methods.—"Nature."

Photographing a Church Service.—A unique photograph was on Sunday last taken in London—a church service was actually "flashlighted" during its progress. Needless to say, one of the illustrated papers was the promoter of this enterprising innovation. The scene of the photograph was the Church of St. Mary-at-Hill, adjacent to the Monument, and the occasion was the annual "Doll Service," which the Rev. W. Carlile, the founder of the Church Army organizes for the benefit of the slum children. Having previously obtained Mr. Carlile's permission to perform his daring feat, the photographer adjusted his camera and prepared his illuminating apparatus, a delicate preliminary which those who have attended public dinners will probably call to mind. The fuse was then applied, the plate having previously been exposed, when there

arose a bright sheet of flame, which lit up the surrounding building, including the faces of the assembled congregation, many of whom were carrying dolls, which were subsequently laid on the altar. When the momentary flash ceased, a volume of smoke rose up to the roof of the church like a stream of incense. The incident, as the reporters have it, then closed. "M. O." writes to "The Times" on the subject:—"Last Sunday a 'doll service' was held at the Church of St. Mary-at-Hill, during which a flashlight photograph was taken of the proceedings, the congregation posing for the purpose, while the church was filled with the fumes of the remains of the flashlight. Another service of a similar character is to be held next Sunday, viz., a 'pudding service.' I understand 'the first pudding will be reverently presented at the altar.' Can nothing be done to stop these outrageous misuses of the churches of our land, where we pride ourselves on doing everything decently and in order? . . What are the Bishops about to allow these travesties of Divine worship?"

Commercial & Legal Intelligence.

The Poisons Committee.—The Committee appointed by the Lord President of the Council to inquire into what alterations may be expedient in Schedule A of the Pharmacy Act, 1868, sat at Whitehall last week, Sir Herbert Maxwell, M.P., in the chair. There were also present Mr. A. Cross, M.P., Professor T. E. Thorpe, Professor W. A. Tilden, Dr. Stevenson, Mr. W. Martindale, Mr. J. H. Harrison, and Mr. E. B. Masham (Secretary). The following witnesses were examined: Mr. Isaac Connel, Secretary of the Scottish Chamber of Agriculture; Mr. W. Wynn Westcott, Coroner for North-East London; Mr. J. W. Lytle, manufacturing chemist, Liverpool; Mr. T. V. Pettifer, manufacturing chemist; Mr. J. L. Major, of Messrs. Major and Co., Ltd., manufacturers of disinfectants; Mr. James Cockburn, chemist, managing director of Messrs. F. Spite and Co., Ltd., manufacturers of chemical and proprietary goods, including sheep dips, weed killers, etc.; Mr. W. Darlington, farmer and member of Council of the Worcestershire Agricultural Society; and Mr. R. H. Smith, Sheffield, Secretary of the Ironmongers' Federated Association. The next sittings of the Committee will probably be held in January.

Brooks-Watson Daylight Camera Co., Ltd.—Registered by Ashurst and Co., 17 Throgmorton-avenue, E.C., with a capital of £74,000 in £1 shares. Object, to adopt an agreement with Arthur A. Brooks and George E. Watson, and to carry on the business of manufacturers of and dealers in photographic films, plates, apparatus, and materials, merchants, agents, brokers and manufacturers of and dealers in all kinds of merchandise, to acquire, use and register trade-marks, brands, labels, designs, and trade names, to manufacture, construct or acquire and maintain any plant, apparatus, appliances and things necessary or convenient for the purposes of the company's business, and to carry on any business which may seem capable of being advantageously carried on in connection with the same. The subscribers are:—A. A. Brooks, 23 Tower-buildings, Liverpool, engineer, 1 share; G. A. Watson, 81 Tower-buildings, Liverpool, merchant, 1 share; F. L. Bishop, 12 Dee Hills-park Chester, J.P., 1 share; E. Knowles, Heaton Grange, Bolton, cotton spinner, 1 share; H. T. Parke, Withnell-fold, near Chorley, J.P., 1 share; A. E. Parke, Withnell-fold, near Chorley, manufacturer, 1 share; W. B. Parke, Withnell-fold, near Chorley, gentleman, 1 share. The number of directors is to be not less than five nor more than nine; the subscribers are to appoint the first. Qualification, £1000; remuneration as fixed by the company.

Regent-street Polytechnic.—Mr. Edmund Boulnois, M.P., Mayor of St. Marylebone, distributed on Wednesday evening last week, in the large hall of the Regent-street Polytechnic, the prizes and certificates gained by the students of the architectural and mechanical engineering classes. Mr. T. Blashill presided, and there was a very large attendance. Having distributed the prizes, etc., Mr. Boulnois spoke of the rise and progress of polytechnics and secondary education schools. He said the Regent-street Polytechnic was the pioneer of all the institutions that had sprung up in the metropolis to advance education, and it was impossible to exaggerate the advantages afforded by institutions such as that, and the gratitude of posterity would be given to the founder of that polytechnic. They were told by some that England was decaying and going to the dogs, and that they were being passed by other nations in matters of education and science, but he did not believe that. An Education Bill was about to be introduced by the Government, and there would doubtless be the usual fight over minor matters in the House of Commons and a special fight as to who was to carry out the secondary education of the country, whether the School Board, the County Council, the Borough Council, or a specially appointed authority. He did not attach much importance to the question who was to be the authority. They must have secondary education, and there was no doubt that the country was quite ready to pay for it. The proceedings were interspersed with vocal and instrumental music, and concluded with a special display of animated photographs.

A Courageous Photographer.—At the Marlborough Street Police Court, before Mr. Denman, Joseph Welch (25), a cabinet-maker, of Warren-street, Tottenham Court-road, and Frank Lovell (24), a painter, of Pitt-street, Tottenham Court-road, were charged with committing a burglary at 20, Oxford-street, W., and stealing a spirit lamp belonging to Augustus Scott, a photographer. Both the prisoners were small, active-looking men. The prosecutor said that early on Sunday morning his wife awakened him, telling him that a door was slamming and keeping her awake. He got up and closed a door leading to his studio. About two o'clock his wife again woke him, and said that the door was still slamming. He went downstairs again, and, thinking it was a lower door, proceeded further downstairs. To his great astonishment he found two men (the prisoners) ripping up the floor above Messrs. Baker's premises with a large screwdriver (a very powerful "jemmy" formed from an engineer's file bent at one end) and a pruning knife. The screwdriver was between the floor boards, two of which had been torn up. He quickly turned up the electric light, and, the prisoners alarmed, thinking the "click" of the switch to be the trigger of a pistol that was being cocked said, "Don't shoot, mister; it's all right." He said, "You scoundrels, breaking up a man's home like that." Seeing that he was unarmed, they became braver, and were about to make for him, but he seized a poker and struck Welch, who advanced first, on the arm. His son then came downstairs, and his wife blew a police whistle. Lovell tried to escape from the window, but he (prosecutor) rushed at him, and prevented him from getting away. Eventually the police arrived, and the prisoners were arrested. To gain an entry the prisoners would have to get from Oxford Music Hall premises, scale a wall twenty feet high and get through the studio skylight. Constables Brooks, 125 D. Millerwood, 112 D, and Breed 245 C gave evidence of having gone to the house in consequence of hearing a police whistle blown. The prisoners said, "All right, we will come quietly," and they did so. Constable Millerwood added that he found the skylight broken open, a door panel forced out, carpet and linoleum torn up, and a great deal of damage done to the wainscoating. A long rope was hanging to some railings which would enable the prisoners to get into other premises. The lamp referred to and a cycle lamp had been moved from their accustomed place.—Mr. Denman committed the prisoners for trial.

The Bath City Coroner (Mr. B. A. Dyer) held an inquest last week at the Guildhall, relating to the circumstances attending the death of Algernon Spurge, aged 40, who had for several years carried on business as a photographer at 7, The Corridor, which occurred suddenly at his place of business on Monday, December 17. Ida Carlyn Spurge, widow, of 23, Victoria-road, Oldfield Park, said she last saw her husband on the Monday morning, just before he died. The time was about a quarter-past ten. He left home about nine, apparently quite well. After he had left, her daughter sent for her (witness) by a telegraphic communication, the telegram bearing the words, "Come at once." Her daughter sent because she thought he seemed poorly. When she got to The Corridor she found Mr. Terry there, and he said it was a matter of only a few minutes. Deceased was quite insensible. Her daughter showed her a letter after the doctor had gone. The letter, which was in deceased's handwriting, was read by the Coroner. "My dearest Wife,—I really cannot stand the worry and anxiety of another day, to say nothing of weeks and perhaps months. Ask Mr. Ashman and Mr. Withy to be kind enough to help you straighten out matters a little. My best love to you all, my dear ones.—Your loving husband, A. L." In answer to the Coroner, witness said that the worries referred to were in connection with business matters. He had felt the worry during the past month, but he thought he would be able to get through it. She did not think the trouble was to such an extent. He had, however, slept well, and was bright and happy on Sunday. She had never heard him threaten or hint at taking his life. The Coroner: He was a photographer, we have heard. Do you know whether he was in the habit of carrying anything about with him? Witness said he was not. Mr. Ashman was a friend of his. In answer to another question by the Coroner, witness said deceased was not the habit of taking any drug. Ida Marion Marguerite Spurge, daughter, said she assisted her father in his business in The Corridor. When he left home he was all right. He left before her. When she got there about a quarter to ten, she found her father sitting in a chair, crying. She asked him what was the matter, and he said, "Go and get ready," which she took as referring to going on with some work. She again repeated the question, and he replied, "I do not feel very well." She asked him if she should send for "mother," and he said, "Not yet." He then called for some salt and water. She had never heard him ask for anything like that before. She had noticed he had been sick a little before, and as he did not get any better she called The Corridor constable, and handed him a telegram calling her mother to come. When she got back with the salt and water, he said, "Ashman, Ashman," and witness sent out for Mr. Ashman. When she came back he said, "Daisy, Daisy, you can't do anything," and he seemed to lose consciousness. He remained in the chair the whole time. She had found a glass on the floor by his side, but did not notice whether there was anything in it. She got the salt and water in the same glass, and when she brought it he said, "In a cup." He would not touch it out of the glass she had found on the floor. Witness then went and fetched a fresh lot in a cup, and after a sip it seemed to choke him. No peculiar smell struck her when she picked up the glass, and she did not know cyanide of potassium. Being shown a small bottle by the Coroner, witness said her father was not in the habit of carrying anything about like that. The letter she found in his hand, but towards the last he dropped it on the floor. Lately she thought her father had been very much worried, but she had not noticed any difference in consequence of that worry. She had never heard him threaten to do anything to himself. Mr. W. Middleton Ashman, a photographer, of Old Bond-street, said he had known deceased since 1888, and they were very friendly, seeing each other several times a week. With regard to his reference about straightening up matters, the only construction he could put upon it was that he looked upon him (witness) in his capacity as a friend and also as agent for a company in which he was assured, and that he (witness) would see the papers put in order. Mr. Ashman then read the letter handed by the Coroner, and having concluded reading it, remarked, "It's most extraordinary." Witness was then shown a small bottle containing cyanide, and, having examined it, said it would not be issued in that form, and, in his opinion, it was several years old. He hardly thought

deceased would be using it in his ordinary course of business. He did not know of any worries deceased had. Mr. H. G. Terry deposed to being called to see deceased at The Corridor. He was on the floor, breathing very slowly, and died about ten minutes after his arrival. Later in the day he saw the note and the small bottle, which contained cyanide. A postmortem examination had been made, but there was nothing to show that he had taken any of the contents of the bottle. It was, however, very volatile. The contents were not fresh, and, therefore were a little weaker. Mr. Waterhouse, Resident Medical Officer at the Royal United Hospital, and Inspector Noble having given evidence, Mr. J. W. Gatehouse, City Analyst, said he had received some liquid in a sealed bottle, taken from the stomach of deceased. He tested for cyanide, but he obtained no result. He found there was some beer in the stomach. Cyanide, Mr. Gatehouse explained very fully was volatile. The Coroner having briefly summed up, the jury returned a verdict that deceased committed suicide whilst temporarily insane.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
31.....	Stonehouse	*Various Gas-light Papers.* Mr. Catford.
31.....	Thornton Heath	Demonstration: *Velox and Carbona Papers.* D. A. Nightingale.
January.		
1.....	Croydon Camera Club	Lantern Slides.
1.....	Photographic Club	Open Night
2.....	North-west London	Apparatus Night.
3.....	Leicester Literary	Demonstration: *Iron Printing Processes.* T. A. Scotton. Lantern Slides.

Southampton Camera Club.—December 16.—The Camera Club had its last meeting this year, to which ladies were invited. The subject of an illustrated lecture, by Mr. G. R. Johnson, was "Resumé of Outings, 1901," which was thoroughly appreciated. The lecturer detailed the various outings of the Club during the season, which comprised visits to Mottisfont, Netley, Winchester, Alum Bay, and Hurstley and gave descriptions of prominent places of interest in each locality and also made it abundantly clear that the rambles were not only photographically interesting, but were most beneficial from a healthful point of view. He emphasised the desirability of the outings being largely attended during the next summer season. Mr. Johnson also hinted that the admission of ladies to membership of the Club was not an improbability. The discourse was enlivened by about eighty well-selected lantern slides illustrative of the places visited, Winchester Cathedral and its precincts being represented by upwards of thirty creditable reproductions of the most prominent and interesting portions, mostly of the interior. The slides descriptive of the other rendezvous were also much appreciated as the lecturer conducted his audience through the various localities, and this was evident from the hearty vote of thanks given to him at the termination of the meeting.

FORTHCOMING EXHIBITIONS.

1901.

Dec. 27–Mar. 1902 ... Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

„ 27–Jan. 4, 1902 Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart 93 Norfolk-street, Glasgow.

1902.

February 13–15 ..... Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries: W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell Hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.

„ 15–Mar. 8 Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.

„ 19–26 ..... Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.

March 1–8 ..... South London Photographic Society, Public Baths, Church-street, Camberwell. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh-hill, Blackheath, S.E.

PHOTOGRAPH REGISTERED:—

D. Osborne, 27, Mary-street, Treharris, Glam. *Photograph of T. Mann.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

STAMP PHOTOS.—F. TEMPLE writes: "Having to execute an order for a large quantity of stamp photos, and having no apparatus for the production of them, I should be extremely glad if you would inform me how to produce same, and what apparatus I should require for further large orders?"—If you refer to the advertisement columns of the ALMANAC for 1902, published last week, you will see the necessary apparatus is supplied by more than one firm. With these apparatuses the work is quickly done, and they are not expensive.

THE AMERICAN TARIFF.—"X. L." writes: "I am thinking of going to America, and should like to take a few snapshots during the voyage. I am a professional, and my camera is an American make. Should I be taxed for it, and should I have any difficulty in getting my exposed but undeveloped plates through the Customs without having to submit them for a close examination, which, of course, would spoil them?"—In reply: If the camera is for use in the States, and not a new one, no duty will be charged upon it. We expect you will have to pay duty on the dry plates. You will have no trouble at the Customs if you explain that the plates must not be exposed to light.

STEREOSCOPY, &c.—"CONRAD" writes: "(1) Which is the best way to finish stereoscopic slides, by means of glass positives or ordinary silver prints? (2) Could slides made on glass be effectively coloured? (3) Is there any firm who undertake the colouring of such slides? (4) Is there any firm who let out on hire the necessary apparatus for the production and projection of cinematograph films?"—In reply: (1) It is quite a matter of taste; but transparencies are usually considered most pleasing. (2) Yes, just as effectively as are coloured lantern slides. (3) Any of those who colour slides would also colour stereoscopic slides. (4) We are not sure, but possibly Mr. Walter Tyler, of the Waterloo-road, or the Biograph Company may do so. Better write to them.

PATENTING AN INVENTION.—"H. H." writes: "Being a reader of your JOURNAL, I venture to ask your advice. I have an idea which seems to me worth patenting, but, having no experience, I do not know how to start about it. I should esteem it a kindness if you could let me know how to go about it. I am rather perplexed what to do, as my idea can be worked two ways with the same thing, and it answers the purpose either way, and I was thinking if I protected it one way, if the idea was any good, somebody would patent the other way, which would strike them at once if they saw one of the ways; or could it be so protected that no one could use the same material for the same purpose? Trusting you will see your way clear to give me the information."—In reply: If you take out the patent yourself, obtain from the Patents Office forms A and B. For these no charge is made. Fill them up, describing the invention, and then take them to the Law Courts and get them stamped; this will cost you one pound, and it will give you protection for one year. Within nine months, however, you must file the complete specification, which will then give you a patent for four years. The cost of this will be three pounds—four pounds in all. Your present address will do. It is possible that the two ways of working can be embodied in the one patent, if it is so worded. Possibly it might be worth your while to put the matter in the hands of a patent agent.

FLASHLIGHT PHOTOGRAPHY.—"F. W. L." writes: "Could you advise me as to the best method of securing with certainty a good negative of a dinner party to be taken by flashlight in a room lighted by the usual clusters of small incandescent electric lamps? The distance from the camera to the opposite angle of the walls would be about forty-five to fifty feet, and the lamps would be included on the plate, which I should, of course, back liberally. As I cannot make test beforehand, would like to learn:—(1) What speed of plate to use with f-16 in the lens? (2) What form of flash, with formula and quantity of material for each exposure? (3) What would be the probable exposure for the room only, using the electric lamps, without flash, plate, and lens stop as above? (4) Any special precautions advisable beyond keeping flash screened from lens, backing plate, and using a developer weak in pyro or rodinal?"—In reply: (1) The quickest plate you can procure. (2) There are so many flash lamps and compositions in the market (see the advertisements in the ALMANAC), all of which are good, but it is against our rule to recommend any particular maker's goods. (3)) Impossible to say, but the exposure would be far too long to successfully secure the portraits of the guests. (4) No, except that in so large a space it would be necessary to have more than one flash fired simultaneously. Also not to uncap the lens till just before the flash, and then the incandescent lights will not be so obtrusive in the picture. You had better make one or two trial exposures in the empty room; they will serve as a guide.

MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

To the "British Journal of Photography." *February* 1, 1901.

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ON RED AND PURPLE CHLORIDE, BROMIDE, AND IODIDE OF SILVER; ON HELIOCHROMY, AND ON THE LATENT PHOTOGRAPHIC IMAGE.

I.

In this series of papers it will be my object to show: (1.) That chlorine, bromine, and iodine are capable of forming compounds with silver exhibiting varied and beautiful colouration, peach-blossom, rose, purple, and black. That these compounds (except under the influence of light) possess great stability; that they may be obtained by purely chemical means, and in the entire absence of light. (2.) That of these substances the red chloride shows a tendency to the reproduction of colours. It seems not improbable that the material of the infinitesimally thin films obtained by Becquerel, Niépce de St. Victor, Poitevin, and others in their experiments on heliochromy may be the red chloride. (3.) That these substances, formed by purely chemical means, constitute the actual material of the latent or invisible photographic image, which material may now be obtained in the laboratory without the aid of light and in any desired quantity. They also form part of the visible product resulting from the action of light on the silver haloids.

For more than a generation past the nature of the latent photographic image, that which forms the basis of development, has been in dispute. Two theories have been maintained. According to the one, the first effect produced by light is simply a physical change, predisposing the elements of the silver haloid to dissociation, so that when a reducing agent is applied the molecules so affected yield more quickly to its influence. According to the other theory, the invisible image is formed of a subsalt (sub-chloride, &c.). Observations which I published many years ago led me strongly to the first-mentioned of these theories. But, of late years, results have been obtained not easily reconcilable with it. On the other hand, the theory that the latent image is formed of subsalt is opposed to striking facts. Silver sub-chloride, for example, is an unstable substance, quickly destroyed by dilute nitric acid. But I have formed a latent image on silver chloride, and after exposing it for five minutes to the action of strong nitric acid (s.g. 1·36) have developed the image without difficulty; the same with silver bromide. Evidently these images, which so strongly resisted the action of undiluted acid, could not be formed of simple sub-chloride and sub-bromide of silver, substances quickly destroyed by it.

In the desire to find a satisfactory explanation of the nature of the image based on adequate chemical proof, I have devoted nearly three years of laboratory work to this and to closely allied subjects. I am led to the conclusion that neither of the older views is correct. A truer theory seems to be deducible from the result of some experiments which I published in 1885, to the effect that the silver haloids were capable of uniting with certain other substances, much in the same way that alumina forms lakes. When a silver haloid was precipitated in the presence of certain colouring matters they combined with it, and, though soluble in water, they could not be subsequently washed out. They had formed a somewhat stable compound, although the proportion of colouring matter was very small in comparison with the haloid; evidently much too small to represent a stoichiometrical composition. Now, I find that a silver haloid may in the same way unite with a certain proportion of its own subsalt, which, by this union, quite loses its characteristic instability and forms a compound of great permanence.

Another explanation is possible; the subsalt may combine with the normal salt, not in the manner above described, but in stoichiometrical proportion, and this compound may be diffused through ordinary silver haloid. I have not been able to find any reaction decisive between these explanations,* but the general behaviour of the substance seems rather to indicate the first-named explanation as the true one. When the red chloride, for example, has been boiled with dilute nitric acid for a few moments to eliminate any uncombined sub-chloride the proportion of sub-chloride left has never exceeded eight or nine per cent. in over thirty specimens analysed. If we took this to represent a compound in equivalent proportions, we should have to suppose the union of at least twenty equivalents of AgCl with one of Ag_2Cl, which is improbable. If we suppose that these coloured substances containing from less than one-half per cent. up to eight or nine per cent. of Ag_2Cl consist of a compound of one equivalent of sub-chloride united to a small number of equivalents of normal chloride, mixed mechanically with a large quantity of normal chloride, then it would be improbable that specimens could not be obtained containing a larger proportion of this compound, and consequently of Ag_2Cl; but, as already said, specimens containing more than nine per cent. after thorough treatment with nitric acid to remove the uncombined sub-chloride I have never obtained; generally the amount is less.

Even when silver chloride, bromide, or iodide, contains as little as one-half of one per cent. of subsalt combined, its properties are greatly changed. It has a strong colouration, and its behaviour to light is altered. Even a much less quantity, one inappreciable to analysis, is capable of affecting both the colour and the behaviour to light. It is one of these latter forms of this substance that constitutes the actual material of the latent photographic image. Adequate proof of this will be given in the second part of this paper.

Red Silver Chloride.

Of the three haloids, the chlorine salt is the most interesting, because of its relations to heliochromy; it is also the most stable of the three compounds, and exhibits, perhaps, a finer variety of

* Silver chloride may be dissolved out by hot solutions o sodium or ammonium chloride, but the sub-chloride is at the same time decomposed. See beyond under head of "Reactions."

colouration, though the bromide and iodide are also obtainable of very beautiful tints. The chloride shows all the warm shades from white to black through the following gradations: white, pale flesh colour, pale pink, rose colour, copper colour, red-purple, dark chocolate, black.

These compounds are obtained in an endless variety of ways: by chlorising metallic silver; by acting on normal chloride, with reducing agents; by partly reducing silver oxide or silver carbonate by heat and treating with HCl; by forming sub-oxide or a subsalt of silver and treating with HCl, followed by nitric acid; by acting on sub-chloride with nitric acid or an alkaline hypochlorite, &c.; by attacking almost any soluble salt of silver with ferrous, manganous, or chromous oxide, &c., followed by HCl; by reducing silver citrate by hydrogen and treating it with HCl; by treating a soluble silver salt or almost any silver solution with potash or soda, and almost any reducing agent, cane sugar, milk sugar, glucose, dextrine, aldehyde, alcohol, &c., and supersaturating with HCl; there is no organic easily oxidisable substance that I have tried that has failed to give this reaction. Also almost any salt of silver exposed to light, treated with H Cl and then with hot strong nitric acid, yields it. Almost any of these classes represents a long range of reactions, each susceptible of endless variation. In fact, the more the matter is studied, the more extended the range of reactions is found to be that give rise to the formation of this substance. To show how slight an influence will lead to the production of red chloride instead of white, if freshly precipitated argentic oxide is mixed for a few moments with starch or tragacanth paste, and is then treated with HCl, the result is, not white, but pink, silver chloride. Even raw starch flour mixed with silver oxide will, in a few moments, cause it to give a pale flesh-coloured chloride with HCl. Boiled starch or tragacanth paste does this more quickly and acts more strongly, even in the cold, and still more if heat is applied.

Although red is probably the most characteristic colour of this substance, so that I have spoken of it above as red chloride, nevertheless this hardly seems a proper name for a substance that is often purple, chocolate, or black, sometimes brown or even ochreous, sometimes lavendish or bluish, and is probably capable of assuming every colour of the spectrum. To call it argento-argentic chloride would infer a stoichiometrical composition that, as already mentioned, seems very uncertain, too much so to serve as the basis of the name. Therefore, and as these substances have been hitherto seen only in the impure form in which they are produced by the continued action of light on the normal salts, it might be convenient to call them photo-salts, photo-chloride, photo-bromide, and photo-iodide instead of red or coloured chloride, &c., and thus to avoid the inexactness of applying the term red chloride to a substance exhibiting many other colours.

Photo-chloride by Action of Alkaline Hypo-chlorites.—Black or purple-black chloride is easily obtained by the action of an alkaline hypo-chlorite on finely divided silver, such as obtained by reduction in the wet way. Commercial sodium hypo-chlorite may be used to act on it. It is to be poured over the silver, and, after standing a few minutes, is to be replaced with fresh. After an hour or two this is again to be replaced with a new portion, which is to be allowed to act half an hour to ensure the total conversion of the silver. The product varies somewhat in colour, is sometimes black, oftener purple-black. If the treatment with hypo-chlorite has been thorough, strong cold nitric acid of 1·36 s.g. extracts from it no silver. This reaction with nitric acid is important, as it shows that not only metallic silver was not present, but that the product contained absolutely no uncombined sub-chloride; for, if any were present, it would instantly be decomposed by the acid, in which one-half of its silver would dissolve. The action, therefore, appears to take place in this way. First sub-chloride is formed, part of this is further chlorised into normal chloride which at once combines with other sub-chloride, thus taking it out of the further immediate action of the hypo-chlorite, and this goes on until an equilibrium is reached, and neither metallic silver nor uncombined sub-chloride is left, as is proved by the action of nitric acid. Alkaline hypo-chlorite as, will presently be shown, attacks uncombined sub-chloride very rapidly, the combined very slowly; by many days' contact the quantity of combined sub-chloride is gradually reduced.

Prolonged treatment with hot strong nitric acid destroys all the varieties of photo-chloride. The time needed varies a good deal. A specimen of that obtained with hypo-chlorite required twenty-five hours' heating with acid of 1·36 in a water bath at 212° Fahr to bring it to the condition of white normal chloride. Considering that cold dilute nitric acid instantly destroys freshly precipitated argentous chloride in the free state, this long resistance to strong acid at the temperature of boiling water must be considered most remarkable.

When the red or photo-chloride is formed with the aid of a ferrous salt or ferrous oxide, I prefer to boil the product with dilute HC to get rid of the last traces of iron, after a preliminary treatment with hot dilute nitric acid has removed silver and uncombined sub-chloride. The photo-chloride will sometimes even resist boiling aqua regia for a time.

Protected from light, photo-chloride is perfectly stable. Specimens obtained eighteen months ago appear to be quite unchanged.

When treated with ammonia, it is far more slowly attacked than the normal. The ammonia dissolves the normal chloride only. The union between the two must therefore be broken up, and this takes place slowly. The first action of the ammonia is to change the red or purple colour to greenish-black and then to slowly dissolve out silver chloride. Hours are required even with a large excess of ammonia. Whilst this is going on, if the ammonia is poured off and replaced with nitric acid, the original colour reappears. If the action is continued sufficiently long, silver only remains, and dissolves readily in nitric acid. A little short of this, treatment with nitric acid leaves a black residue of dark chloride mixed with metallic silver. The dark chloride being insoluble in any acid has led to some strange mistakes in a similar reaction which occurs in treating with ammonia silver chloride that has been exposed to the light. Even a theory has been had recourse to of a "passive condition" of silver. This passive silver is simply black chloride.

A specimen of purple-black chloride was treated with warm strong aqua regia until whitened by conversion of the sub-chloride to normal. By this treatment 2·563 grammes of photo-chloride gained nine milligrammes, indicating the presence of two and a half per cent. of sub-chloride, or, more exactly,

Sub-chloride	2·49.
Normal chloride.....	97·51.

This is not to be taken in any sense as representing a constant composition. The proportion of sub-chloride varies between certain limits, not only according to the method of preparation used, but independently of it. Another specimen of black chloride formed with hypo-chlorite gave figures that indicated a constant of less than half of one per cent. of sub-chloride.

Photo-chloride by Reduction of Normal Chloride.—This is an excellent means of obtaining red chloride. The white chloride is to be dissolved in ammonia and ferrous sulphate added, producing an intensely black precipitate. After standing a minute, the mixture is to be treated with dilute sulphuric acid until it shows a strong acid reaction.

The precipitate is to be first well washed by decantation, then boiled first with dilute nitric, then after washing with dilute hydrochloric acid, which must, of course, be thoroughly washed out.

The product obtained in this way is often of singular beauty, It might easily be taken for metallic copper. Sometimes it is as rich and bright in colour as the copper obtained by electric deposition. Every one knows the richness and brilliancy of that form of copper, and I have seen it fully equalled by this silver salt.

The beauty of the colour depends always on the thorough removal of any metallic silver that may be present, and still more on getting rid of every trace of iron. The boiling with dilute hydrochloric acid should be continued until, after thorough washing, a fresh treatment extracts no more and the acid remains colourless in presence of alkaline sulphocyanide.

Instead of an ammoniacal solution of silver chloride, we may make

a solution of any other silver salt in ammonia and reduce it in the manner just described with ferrous sulphate. But in this case hydrochloric acid must be used instead of sulphuric after the reduction. This single reaction includes an almost endless variety of methods. The acid with which the silver was originally combined seems to be not without influence on the result; in some cases, for example, with arseniate and molybdate, the action of coloured light on the red chloride seems to be somewhat modified. Silver phosphate, on account of the ease with which it suffers reduction, is very well adapted for this treatment.

Photo-chloride by Partial Reduction of Oxide by Heat, and Treatment with HCl.—This method has the advantage of avoiding all admixture of foreign substances, the last traces of which are very hard to get rid of, and seem to exert an effect on the colour disproportionate to their quantity. Accordingly the photo-chloride obtained in this way is very beautiful, the shades are from pink to copper red, and a tint resembling burnt carmine.

Heat may be applied to the oxide in either of two ways, long-continued heat at 212° Fahr., or near it; or the change may be effected by roasting.

When slow heat is to be applied, care must be taken that the oxide does not carbonate itself, which it easily does superficially; this is an objection, because the carbonate, under these circumstances, yields white chloride with which the other becomes mixed. The air of a drying oven heated by a gas burner is especially bad in this respect. I have seen a surface of oxide form a coat of yellow carbonate in a few hours in this way. (Most oxide that has been kept some time will effervesce briskly with an acid.) The method is uncertain, sometimes giving strongly coloured products and sometimes pale pink.

The oxide may be roasted in a shallow, flat-bottomed porcelain basin. With a very moderate heat it changes from brown to black. When this is thoroughly accomplished and before grey reduction sets in, the oxide is to be treated with HCl. If this be done in the basin itself after cooling and without disturbing the position of the oxide, a curious variety of tints will be noticeable, depending upon slight differences in the heat affecting different portions.

II.

Silver Carbonate may be roasted in the same way as silver oxide, and yields a similar product. By heat its colour changes from yellow to black; it is probable that the carbonic acid is driven off at a lower temperature than that at which oxide is reduced to silver, and that with it escapes part of the oxygen. The residue is converted by HCl into deep red chloride.

Action of Various Metallic Oxides on Silver Oxide.—If we precipitate ferrous oxide with potash and add to this silver oxide, or, what amounts to the same thing, if we add to ferrous sulphate potash in excess and pour over this silver nitrate solution, the silver oxide separated by the potash is partly reduced by the ferrous oxide, and when treated with HCl forms red chloride, the intensity of the colour of which depends within certain limits on the amount of reduction of the silver oxide.

Similarly if we treat solution of manganous sulphate with excess of potash and then add silver solution, we get an analogous reaction, except that it is much weaker and heat is necessary.

With chromous oxide the action is still weaker, but evident. With cobaltous oxide it is scarcely perceptible without heat and long-continued action.

Action of Ferric Chloride on Metallic Silver.—It has been long known that silver was blackened by ferric chloride, and this action has been proposed in the text-books as a means of obtaining sub-chloride, for which it is quite unsuited.

Ferric chloride acts on silver much as sodium hypo-chlorite does, but less rapidly. With hypo-chlorite the action is complete in a few hours, or often in an hour or less; with ferric chloride one or two days are required before the product ceases to yield silver to hot dilute nitric acid. In both cases the action appears to be alike in this, that no sub-chloride is finally left uncombined with normal chloride.

The product is an intensely dark purple-black when the action takes place in the cold. With heat continued for many hours, ferric chloride can be made to attack the purple salt and gradually convert it into AgCl. With a strong solution in large excess kept at or near 212° Fahr., for sixty hours the colour was gradually reduced to pink, and finally to a dingy pinkisk grey. Pure white cannot be obtained, as it can by aqua regia.

In order to observe more exactly the course of the action, a strong solution of ferric chloride was allowed to act on reduced silver in fine powder for four minutes, and then a fresh portion (always in large excess) for the same time. Analysis showed that at this stage of the action the material contained—

Ag (determined)	76·07.
Cl (by difference)	23·93.
	100·00.

If we suppose that all the silver was combined with chlorine, the constitution of the substance would be—

AgCl.....	92·49.
Ag_2Cl	7·51.
	100·00.

But this was probably not the case; there was almost certainly free silver present, and consequently a less proportion of sub-chloride Another specimen, treated repeatedly with hot acid until every trace of free silver was removed, was found to contain 1·52 per cent. of sub-chloride, colour purple. Another similarly treated contained 7·3 per cent. of sub-chloride.

Action of Nitric Acid on Silver Sub-chloride.—When freshly precipitated and still moist, sub-chloride of silver is treated with nitric acid, a sharp effervescence accompanied with a disengagement of red fumes sets in; presently the strong red colouration of the photo-chloride appears and the action ceases. This production of the red and not white chloride in the decomposition of Ag_2Cl is precisely what might have been expected, for, when AgCl is formed in the presence of Ag_2Cl, more or less combination always takes place.

The action is interesting in this respect: the AgCl first formed is at the moment of formation in presence of all the yet undecomposed portion of Ag_2Cl, and whatever part it combines with is removed from the action of the acid. It would therefore seem probable that this method would be one of those that yielded a product having the largest proportion of Ag_2Cl, but analysis showed that different specimens were extremely variable—of those analysed, one contained 8·62 per cent. of Ag_2Cl, another 6·56, and a third 1·96. All that analysis can do with such substances is to fix the limits within which they vary. The quantity of sub-chloride left after treatment with nitric acid depends partly on the strength of the acid and the time for which it is allowed to act, but also to some extent on variations in the resistance of the substance itself. These specimens were of shades between rose and purple.

The colour of any particular specimen is always lightened in shade by abstracting Ag_2Cl from it by continued boiling with nitric acid. But as between different specimens, especially when formed by different reactions, it by no means follows that the darkest in colour contains the most sub-chloride.

Argentous chloride when treated with sodium hypo-chlorite yields a purple form of photo-chloride. A specimen so treated contained 2·57 per cent. of Ag_2Cl.

Action of Cupric Chloride on Silver.—When metallic silver is submitted to the action of either cupric chloride, or, what gives the same result, a mixture of copper sulphate and ammonium chloride, an action takes place very similar to that of ferric chloride, but more energetic, and the resulting red chloride is apt to be lighter in shade, though in this respect it varies very much. As in the case of ferric chloride, this action of cupric choride on silver is given in some text-books as a means of obtaining argentous chloride, for which purpose it as little suited as the iron salt.

As a mode of obtaining red chloride it is not to be recommended. It is troublesome to get the copper completely removed. A specimen analysed was found to consist of white chloride with 6·28 per cent. of sub-chloride.

Action of Proto-chlorides on Silver Solution.—Cuprous Chloride.—When very dilute solution of silver nitrate is poured over cuprous chloride, a bulky black powder results, which by boiling with dilute nitric acid turns red, the acid extracting little or no silver.

Ferrous Chloride.—When silver nitrate is dissolved in a slight excess of ammonia, and this solution is poured into a strong one of ferrous chloride, there results a precipitate which is sometimes greyish, sometimes olive black. By washing with dilute sulphuric acid this product becomes brownish-purple, and brightens by boiling with dilute nitric acid. It was found to contain 4·26 per cent. of sub-chloride.

Photo-chloride by Action of Hydrogen.—When hydrogen is passed over argentic citrate at 212° Fahr., as in Wöhler's process, there results a black or dark brown powder consisting of argentous citrate, metallic silver, and perhaps other substances. When this is treated with hydrochloric acid and subsequently with nitric, the resulting product is photo-chloride, the characteristic colour of which sometimes appears as soon as the HCl is added. But more frequently the material after the action of HCl has precisely the appearance of silver reduced in the wet way, and the red colour appears only after treatment with nitric acid. Even cold dilute acid (by some hours' contact) will isolate the red chloride; boiling acid does so at once.

Colour, beautiful purple. A specimen analysed was found to consist of normal chloride combined with 3·11 per cent. of sub-chloride.

Photo-chloride by Action of Potash with Oxidisable Organic Substances.—There is no better method of obtaining photo-chloride than by acting on a salt of silver with potash and certain organic substances. Milk sugar, dextrine, and aldehyde give particularly good results. Milk sugar acts rapidly, dextrine slowly. Other substances with which, combined with potash, I have obtained chloride, are:—gum, tannin, gallotannic acid, manna, glycerine, alcohol, carbolic acid, &c. The number might, doubtless, be indefinitely multiplied. After the action has reached a proper stage, which with milk sugar is apt to be in less than a minute, and with dextrine may take half an hour, HCl is added, whereupon the precipitate changes in appearance, but does not exhibit its characteristic colour until after boiling with nitric acid; the best result is obtained when the precipitate, after addition of HCl, has a rich chestnut brown shade,* which by nitric acid changes to shades of purple and burnt carmine, when milk sugar, dextrine, or aldehyde, has been the reducing agent. When the salt of silver employed has been the chloride, of course treatment with HCl is superfluous.

A specimen, obtained by acting on silver nitrate with potash and dextrine, was found to contain 2·26 per cent. of sub-chloride. Another obtained with silver nitrate, potash, and milk sugar, contained only 0·34 per cent. As in former instances, these determinations are useful only in indicating the extreme variability of these substances and their approximate limits of composition.

Other Reactions leading to the Formation of Photo-chloride.—A few more instances are here added, indicating the variety of ways in which this product may be obtained.

The following is an interesting reaction:—If a solution of ferrous sulphate is made strongly acid with HCl and solution of silver nitrate added, the silver is thrown down as white chloride. But if to the silver solution is first added a little ammonia, enough to redissolve the oxide, but much less than enough to neutralise the acid added to the iron solution, then, on pouring the silver solution into the iron, the silver falls as red chloride. So obtained, it has but at first a dull purple or shade, but by purification, as before described, a good product is obtained. This method, however, scarcely tends to the production of the splendid copper red shades of colour that are got by acting on silver chloride dissolved in ammonia with ferrous sulphate, and then adding dilute sulphuric acid. The shade of colour shown by any particular specimen is always of interest, because, as before mentioned, it modifies the effect exerted upon it by the spectrum.

Potassio-ferrous Oxalate. — The now well-known "oxalate developer," which I described in this JOURNAL some years ago, throws down from silver nitrate a black powder; this precipitate treated with HCl scarcely alters in appearance, but, washed and boiled with dilute nitric acid changes to a deep purple.

Pyrogallol is capable of leading to the formation of photo-chloride. When ammoniacal solution of silver nitrate is poured into solution of pyrogallol in water made strongly acid with HCl, in such proportion that the mixed solutions remain strongly acid, there falls a greyish product, which by washing and treatment with hot dilute nitric acid becomes bright pink.

Ferrous Oxide differs essentially in its action on silver solutions from ferrous sulphate. A silver nitrate solution added to one of ferrous sulphate precipitates grey metallic silver. But if potash or soda is first added to the ferrous solution, and then silver nitrate, followed by HCl, the red chloride is formed abundantly. This reaction is similar to that already described, in which an ammoniacal solution of a silver is added to one of ferrous sulphate.

To the same class of reactions belong the following: Silver carbonate with excess of sodium carbonate is thrown into solution of ferric sulphate, and after standing a few minutes HCl in excess is added. The silver is converted into red chloride.

It seemed possible that silver itself might be made the means of reducing its chloride. The experiment was made in this way: Freshly precipitated and still moist chloride was intimately mixed with metallic silver in fine powder and a little water. This was heated till the water boiled and nitric acid was added. After the action was over, the chloride had assumed a deep pink colour. A similar result is obtained without the aid of heat, but the resulting colour is much paler.

Analogous to this is the following: When a cake of fused silver chloride in a crucible is reduced with dilute sulphuric acid and zinc, if the reduction is interrupted when not quite finished, and the metallic silver is dissolved out with hot nitric acid, the residue of silver chloride will be found to be pink.

When HCl is brought into contact with Ag together with an oxidising agent, such as a bichromate or permanganate, it gives rise to formation of coloured chloride. These I have not specially examined, but there can be little doubt that they are identical in nature with the foregoing. So, too, when silver in contact with mixed potassium chloride and chlorate is cautiously treated with dilute sulphuric aid.

The reactions above described will serve to show under what a vast variety of conditions the photo-salts are formed. Most of the methods here described represent each a whole class of reactions, all resulting in the same general way, and these classes might, doubtless, be largely added to. Almost any silver solution brought into contact with almost any reducing agent, and then treated with HCl, gives rise to the formation of photo-chloride. Almost any chlorising influence brought to bear on metallic silver has the same result, or when silver is brought into contact with almost any oxidising agent and HCl. It may be said without exaggeration that the number of reactions that lead to the formation of photo-chloride is much larger than that of those leading to production of normal chloride.

Reactions of Photo-chloride.—Exposed to ordinary diffuse light, all the bright shades of silver photo-chloride quickly change to purple and purple-black. The darker shades are more slowly influenced.

Mercuric chloride gradually changes it to a dirty white.

Mercuric nitrate dissolves it easily and completely, but apparently with decomposition, as it can only be recovered as white chloride.

Potassic chloride seems to be without effect.

Potassic bromide soon converts it to a dull lilac, which at the end of twelve hours showed no further change.

In contact with potassic iodide the colour instantly changes to blue-grey; this change is produced by a quantity of iodide too small to dissolve even a trace of silver; the filtrate is not darkened by ammonium sulphide. With a larger quantity silver is dissolved abundantly. By acting with renewed iodide solution, the substance continually darkens and diminishes until only a few black points, barely visible, are left.

Treated with dilute solution of potassium chlorate and HCl, the red substance gradually passes to pink, to flesh colour, and, finally, to pure white.

* A specimen in this stage, and before treatment with nitric acid, was found to contain 99·68 per cent. of silver, showing it to be a mixture of metallic silver with chloride and sub-chloride.

The action of heat on the photo-chloride is very curious; its tendency is generally towards redness. Specimens appearing quite black are rendered distinctly purple or chocolate by heating to 212° Fahr. in a drying oven. Often when the substance first separates by addition of HCl, it is pure grey; this grey will often be changed to pink by simply heating to 212°. (This happens when a grey form is produced; if the greyness is due to admixed metallic silver, it is only removed by boiling with nitric acid.)

The somewhat surprising change of colour which is often seen when the crude substance is boiled with nitric acid (sometimes from dull, dark grey to crimson) is due to three concurrent actions: that of the mere heat, the removal of the silver, and the breaking up of uncombined sub-chloride.

It is not possible to dissolve out the normal chloride by a solvent like ammonium chloride from the photo-chlorides, leaving the sub-chloride behind. When red chloride is boiled with successive portions of strong solution of ammonium chloride in large excess, the material gradually diminishes, until, if the operation is continued long enough, there remains a small residue of a warm grey colour, which consists of metallic silver, and dissolves without residue in nitric silver.

If sodic chloride is substituted for ammonium chloride, the same result follows, except that the operation is greatly more tedious. If persevered in until the hot solution no longer removes traces of silver chloride, the residue consists of nothing but metallic silver.

Action of Light on Normal Silver Chloride. — When silver chloride precipitated with excess of HCl is exposed to light, it becomes with time very dark. Cold, strong nitric acid 1·36 s.g. extracts a trace only of silver.

The principal action of light on AgCl (precipitated in presence of excess HCl) consists in the formation of a small quantity of sub-chloride, which enters into combination with the white chloride not acted upon, forming the photo-chloride, and thus is able to withstand the action of strong nitric acid. At the same time a trace is formed, either of metallic silver or of uncombined sub-chloride, it is impossible to say which. After a certain very moderate quantity of photo-chloride is formed, the action of light seems to cease. The cessation has been noted by many observers, perhaps most exactly by Dr. Spencer Newbury.

The nature of the product formed by the continued action of light on silver chloride seems to support the conclusion that the sub-chloride is combined with the whole of the normal chloride after the manner of lakes rather than in equivalent proportions. If the latter were the case, it seems probable that the continued action of light would extend to much greater decomposition than it is found to do.

The action of light in the formation of the so-called latent image will be examined in the second part of this paper.

Photo-bromide and Photo-iodide.

It has been already mentioned that bromine and iodine form with silver combinations in all respects analogous to those of chlorine. A more particular account of the bromine and iodine compounds must wait for the next succeeding number of this Journal; here it can only be mentioned that these substances are formed much in the same way as the chlorine compound. They are less stable than it, and consequently the number of reactions that lead to their production is somewhat more limited. Each, however, is formed in a great variety of ways, and with the same ease as the chloride. In colour they are for the most part indistinguishable from it, but exhibit different reactions.

Relations of Photo-chloride to Heliochromy.

The photo-chloride was examined both with the spectrum and under coloured glass. The rose-coloured form of photochloride was that which gave the best effect. In the violet of the spectrum it assumed a pure violet colour, in the blue it acquired a slate blue, in green and yellow a bleaching influence was shown, in the red it remained unchanged. The maximum effect was about the line F, with another maximum at the end of the visible violet, less marked than the one at F.

Under coloured glass the colours obtained were brighter; under two thicknesses of dark ruby glass the red became brighter and richer. Under blue glass some specimens gave a fair blue, others merely grey. Under cobalt a deep blue was easily obtained, and under manganese violet, a fine violet, very distinct in shade from the cobalt. Green produced but little effect—yellow was sometimes faintly reproduced but rarely. But the yellow glass of commerce, even the dark yellow, lets through portions of nearly the whole spectrum, as can readily be seen by testing it with the spectroscope.

The dark purple forms of chloride do not give as good results as the rose and coppery shades. These last have many points of resemblance with the material of Becquerel's films, resemblance of colour, probably of composition, as far as we can judge of the constitution of those films from their origin—they were far too attenuated to admit of analysis, and resemblance in the curious way in which their colour is affected by heat, so that the conclusion seems nevitable that they are at least closely related.

There is certainly here a great and most interesting field for experiment; hardly any two specimens of photo-chloride give exactly the same results with coloured light, and this suggests great possibilities. There is the very great advantage in this method over any previous, that the material is easily obtained in any desired quantity, and in a condition most favourable for experiment.

The action of light on photo-chloride can be a good deal affected by placing other substances in contact with it. Any substance capable of giving up chlorine seems to influence the action somewhat; ferric chloride often acts favourably, also stannic and cupric chlorides.

Evidently an important point in all heliochromic processes is that, as white light must be represented by white in the image, it is an essential condition that white light must exert a bleaching action on the sensitive substance employed. Red chloride does not bleach, but darkens in white light, but the property of bleaching, to a very considerable extent, may be conferred on it by certain other chlorides, and particularly by lead chloride and zinc chloride. This I look upon as very important.

Another matter of interest is exaltation of sensitiveness, and this I find is accomplished in quite a remarkable way by sodium salicylate, the presence of which at least trebles the action of light on these substances, and probably on others.

I am persuaded that in the reactions which have been here described lies the future of heliochromy, and that in some form or other this beautiful red chloride is destined to lead eventually to the reproduction of natural colours.

M. Carey Lea.

REMARKS ON X-RAYS AND OTHER RAYS.

[Abstract of a Paper read before the Electrical Section of the Franklin Institute.]

I would like to speak of a probable improvement in the inductorium as an X-ray generator, suggested by my own experience and subsequent measurements. The matter was referred to more at length in an article by myself, "On the Technic of X-ray Work," in the "Philadelphia Medical Journal," January 6, 1900. A quotation from the article makes clear my point:—

"Difficulty is often met in adjusting the interrupter for different rates on account of the sparking which results. In this case the capacity of the condenser is probably not suited to the set of conditions that must be met. In other words, the time of a complete cycle of operations, and the ratio in which this period is divided between closed and opened circuit in the primary, is of considerable importance, and is clearly related to the self-induction of the coil and the capacity of the condenser intended to take up this extra current. If the capacity be too small the condenser will be only partially effective, and sparking will result at the break.

"Adjustments should be made so that the actual interruption of the primary current shall be as sudden as possible. This results in a rapid variation in the magnetic flux through the iron core, which induces in the secondary a rapidly electro-motive force. This act of breaking the primary, however, produces a self-induction in the coil,

which in itself tends to retard the suddenness of the break by causing an arc across between the points as they recede from each other. It seems as if the current possesses a sort of momentum, on account of which it becomes most difficult to stop the flow instantly. If, however, a condenser of large capacity be connected around the break, the extra current will flow into that. The condenser evidently must be of capacity sufficient effectively to absorb all the charge that would otherwise tend to jump between the contact points. But a very important part of the phenomenon is yet to follow. The best iron core will not alone lose its magnetism except after a time, which is considerable when compared with intervals of the minute order of magnitude we are contemplating. To effect this necessary result the condenser at once discharges back through the circuit, the effect being to demagnetise the core very rapidly, thereby inducing an enormous electro-motive force in the secondary.

"I am told by the makers that on the largest commercial X-ray coils the condenser capacities vary from 5 to 15 microfarads. A hasty measurement of the one I am using shows its capacity to be about 35 microfarads. To me this comparison suggests that the ordinary commercial coil would be much more efficient if its condenser were several times larger than usually made. If a coil with an insufficient condenser be operated slowly, it sparks badly at the break for reasons already given. If the speed be increased until the sparking is a minimum, it is so because the time of 'make' has been too short to allow the direct current to attain a maximum; the extra current due to self-induction is therefore less, and the small condenser can take care of it. Obviously, though, under these conditions the coil is not operating with maximum output. The time of 'make,' i.e., the interval during which the primary is closed, ought to be just long enough to enable the current to reach its maximum value. This time, of course, depends on the self-induction of the coil as well as on its resistance. The time of 'break,' i.e., the interval during which the circuit is open, must be long enough to enable the condenser to be charged and discharged. If the make follow the break too soon, clearly the direct current will interfere with the discharge of the condenser."

I will now pass around a few pictures illustrating some of the more recent interesting cases that have come to my attention in which X-ray examination has proved of very great assistance. (The pictures were passed, one at a time, preceded by a few words of explanation in each case.)

Another matter that it seems appropriate to bring before you this evening concerns the claims of priority in making the first electrographs by exposing a photographic plate directly between the poles of an electric machine and allowing the spark to produce its autograph. I noticed recently (see the "American X-Ray Journal," December, 1899, p. 675) "that Dr. Wagner was the first person to get the impression by placing the sensitised plate between the sliding electrodes of a static machine." The short article from which I quote called forth in the next issue of the same journal (January, 1900, p. 693) a letter to the editor from Elmer Gates, claiming to have preceded Dr. Wagner by several weeks or more.

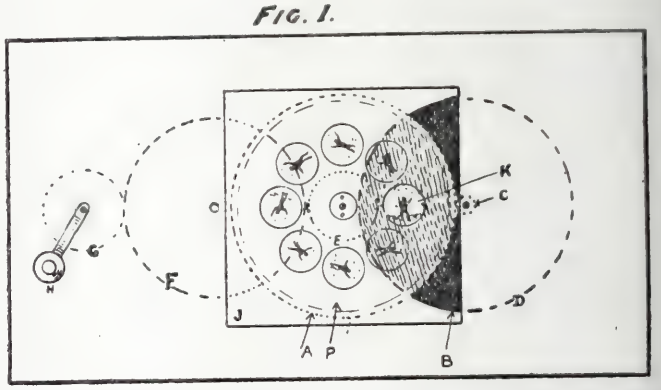
It really seems hardly worth while for these two gentlemen to dispute priority in taking electrographs, since your speaker, in connection with W. N. Jennings, of Philadelphia, made electrographs as early as November 20, 1889, in precisely the method described by Gates. Experiments along this line were conducted at intervals from 1889 till 1893. Electrographs of coins similar to those described in Thompson's book on X-Rays, p. 19, were made by Jennings and myself on February 20, 1890. I am told that Kinraide, of Boston, several years ago showed some beautiful electrographs at the Franklin Institute, and I have not the least doubt that a dozen other experimenters performed the same experiments anywhere from five to ten years ago. Whether this be true or not, of the cases cited I have personal knowledge.

Upon one other point will I say a few words—one which is exciting considerable interest at this time among both chemists and physicists. I refer to the radiation emitted by the recently discovered radio-active substances obtained from uraninite. Early in 1898 Mdme. Curie called attention to the fact that certain uranium minerals, as pitchblende, emitted Becquerel rays even more actively than uranium itself, and suggested the presence of a new substance to which this action is due. Later she and her husband isolated a new material much resembling bismuth and 400 times more active than uranium. To this substance they gave the name polonium, from Poland, their native country. Continued research upon pitchblende brought to light another substance very like barium, which at last proved to be 900 times more active than uranium. To this they gave the name radium. I have a developed photographic plate here which was exposed for several hours to the action of six little piles of uraninite, under each of which was a small piece of sheet metal about 0.005 centimetre thick. The metals were aluminium, lead, silver, gold, zinc, copper, and the plate shows roughly a difference in translucency—the aluminium seeming the least resistive, while perhaps the lead is most so. This suggests a close relation, perhaps identity, with the X-Rays. Recently the Curies are said to have separated still a third radio-active substance from pitchblende. ARTHUR W. GOODSPEED.

ANIMATED SHADOWGRAMS.

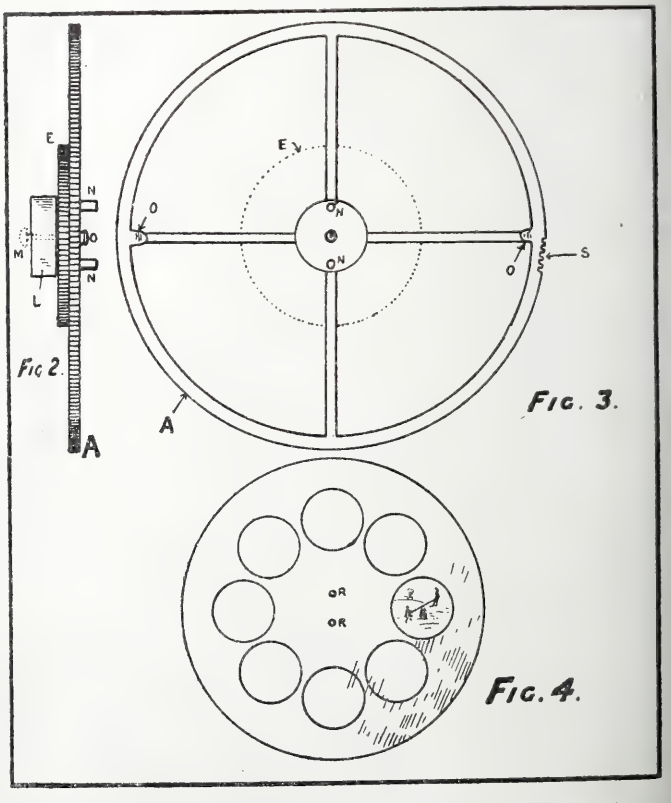
WHILST the cinematograph is absolutely indispensable for a faithful reproduction of such a complex subject as a street crowd, where the composition of movements never presents the same aspect twice, there are subjects which may be successfully reproduced upon the simple wheel of life. A man riding a bicycle, blacksmiths at work,

FIG. 1.



acrobats and tumblers, children on the see-saw, a flat race, and many other similar subjects are fairly well represented by eight successive pictures, as the various positions into which the moving figures fall are identical after a very short interval.

Such scenes may be exhibited in black and white or in colours, and



the apparatus necessary for their projection upon a screen by means of an optical lantern is shown in the accompanying diagrams.

Reference being made to fig. 1, a wooden framework is used, into which the mechanism is fitted. Four wheels, G, F, A, E, are suitably

cogged together, G engaging with F, and F with E, the latter being fixed to the side of the larger cogwheel A, as shown in the side view, fig. 2. The two wheels E and A thus revolve together.

The disc of celluloid, fig. 4 (not drawn to scale), is made the same size as the inside rim of the wheel A. It is pierced with holes at R, R. When placed in position, these holes R, R, are occupied with projecting tongues N, N, figs. 2 and 3, the edges of the disc being slipped under small clips O, O, fig. 3. The disc on which the eight aspects of the scene are painted is thus held flat against the spokes of the wheel A, two of the pictures coming between two spokes. It will be seen from this that the discs are interchangeable, and that the same mechanism may be used for any number of subjects.

In addition to the parts already mentioned a shutter B, figs. 1 and 5, is provided. This has an aperture of exactly the same size as the

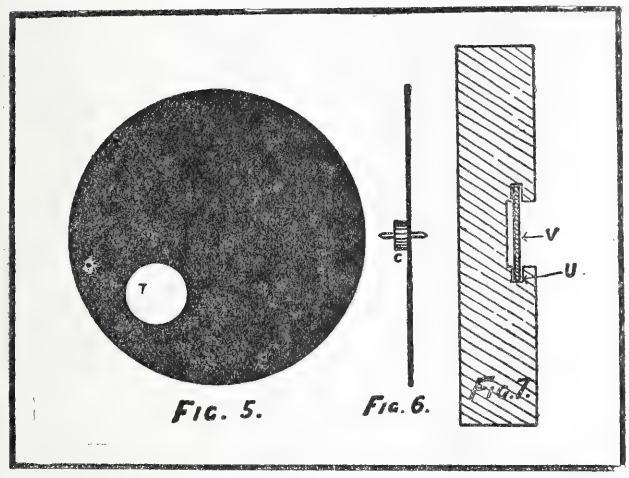


FIG. 5. FIG. 6. FIG. 7.

picture, and is furnished with a small cogwheel C, shown in figs. 1 and 5, and in the side view, fig. 6.

The large wheel A, carrying the discs, engages with the small cogwheel C, and thus causes the shutter B to make one revolution during the time each succeeding picture is falling into position. The object of this gearing up of the shutter is that the slight movement actually made by the pictures before the shutter has quite covered them over may not be visible to the audience.

The wheels C and F and the shutter have their bearings in both sides of the framework, but the large wheel A revolves on an independent pin, which is shown at M in fig. 2. The discs are placed in position through the square opening J made in one side of the framework. On the other side of the framework, exactly opposite K, fig. 2, there is an opening the same size as the aperture in the shutter, and the diameter of the pictures. The apparatus is inserted in the

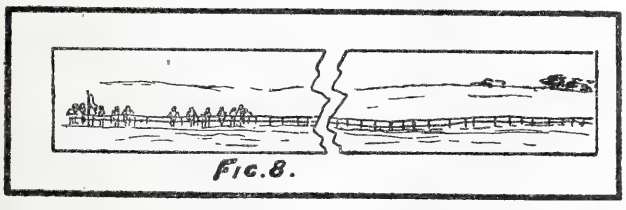


FIG. 8.

stage of the lantern with this opening opposite the centre of the condenser, and, of course, with the pictures in an inverted position.

On turning the handle H F is rotated, which in turn rotates the large wheel carrying the disc of pictures. The subject is thus exhibited in all its aspects through the opening at K, sufficient time being given for each projected picture to make its impression upon the observer's eye, and at the same time affording the necessary rest between each succeeding picture.

With scenes such as that suggested in fig. 4 (a seesaw) it is necessary that the background should be stationary, but, when treating with such subjects as a train in motion, a cyclist, or men running, the effect is best produced by giving action to the figures, allowing them to remain stationary, whilst the background is moved in a direction opposite to that in which the figures are supposed to be travelling. To do this only a slight modification or addition is required.

The framework is provided with a groove U, fig. 7, through which a strip of glass or celluloid bearing the background is slipped. Thus, if the cyclist is treated, his actions are painted in eight successive aspects on the circular disc, and a background such as fig. 8 is painted upon a strip of glass or celluloid. Having inserted the apparatus in the lantern, the sliding glass is pushed through the framework in a direction contrary to that in which the cyclist is supposed to be riding, whilst at the same time the disc is caused to revolve at a suitable rate. The effect is very realistic, and it is difficult to believe that the rider is not actually moving along.

This is an illusion to which the visual faculties are subjected when viewing a passing train from the window of a stationary one.

It is obvious that many subjects may be represented by means of this double arrangement. A train could be made to pass through a railway station and over a viaduct, a man on horseback may trot along a country lane, or a motor car may be depicted travelling through a busy street.

There is another way in which a figure may be shown to pass

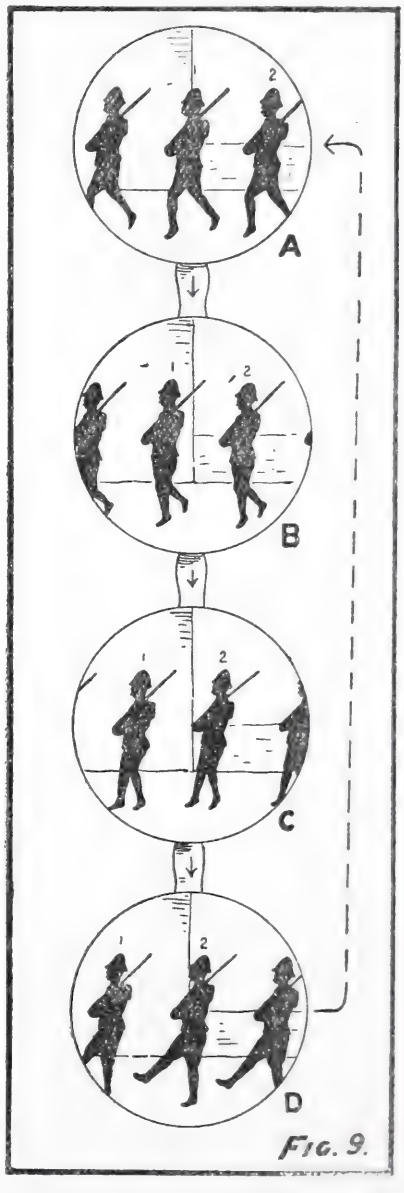


FIG. 9.

across the view, and this is done by the particular arrangement of such figures as shown in fig. 9. If such pictures as A, B, C, D are painted upon the revolving disc, the effect (without using a sliding glass) will be that of an endless line of soldiers marching. It will be seen by reference to these pictures that the soldier No. 2 in picture A occupies, after passing through the four actions presented during a march, the centre position, previously occupied by No. 1 soldier, whilst the position previously occupied by No. 2 soldier is occupied by a third soldier, and so on.

Other subjects, where the objects are moving along and fall into the same positions after a pause, may be treated in the same manner. With the subject dealt with in fig. 9 each picture repeats itself after every four, but in some instances it will be found best to give eight aspects of the moving objects.

THEODORE BROWN.

MOVING PICTURE LITIGATION IN THE UNITED STATES.

According to "The Scientific American," the question of priority in moving picture patents has just come up for argument in the United States Circuit Court for the Southern District of New York, the suit being brought by Mr. Edison against the American Mutoscope Company. The patent, for which the suit was brought, was No. 589,168, granted August 31, 1897, to Mr. Edison, and its claims alleged to be infringed are numbers one, two, three, and five. The first three claims deal with the picture-taking machine, including the single lens camera, the single tape-like film and the rapid-feed movement for feeding the film and turning on and off the light. The fifth claim embodies the continuous translucent film with the pictures upon it. The briefs and arguments state that, by employing a single lens camera, the pictures were all taken from the same point of view, and by making the movable part of the apparatus a tape-like film, the necessary high speed for securing the required large number of pictures per second could be produced without duplication of the film, and this film could be given the considerable length necessary for the continuous taking of pictures over an extended period of time without increasing the weight of the moving parts unduly. The resulting picture strip possessed all the essential characteristics for successful use in an exhibiting apparatus, and permitted of the direct printing of positives upon a similar film. The strip thus produced had pictures taken from the same point of view and arranged in a continuous straight line sequence throughout the length of the film and equi-distant from each other, thus permitting of its use in simple and practical forms of exhibiting apparatus. The complainants stated that a single tape-like film that could be moved with sufficient rapidity to secure the rapid succession of photographs with a single lens was an epoch-making invention. The idea was conceived by Mr. Edison in 1889, but the development of the idea and the formation of the company required so much time that it was not until 1894 that he placed upon the market machines employing the picture film made on his camera. The films and machines were on the market for two years, when the great success of the enterprise caused others to enter the field.

The defence contended that the apparatus was based on the "persistence of vision," which had been known for a century, and that the claims in the patents referred to had been anticipated by prior patents and in printed matter. The prior state of the art was reviewed at great length. It was contended that many moving picture cameras for using long tape-like films had been invented before Edison's alleged invention, and that the rapid progress in the art of recent years was the result of the invention of the Eastman celluloid film, and was not particularly due to the apparatus devised by Edison. A decision will probably be rendered in a few weeks.

TWO POINTS OF VIEW.

SCENE.

An Amateur's Laboratory and Workshop. Various Cameras and Lenses, a Microscope, and a Photo-micrographic Camera *en evidence.*

DRAMATIS PERSONÆ.

Technician Smith: interested in scientific photography and owner of laboratory. He is also author of a standard work, entitled, "The Poison Duct of a Flea," illustrated with photo-micrographs.

Impression Jones: a wellknown "artistic" photographer, chiefly notable for a good opinion of his own work and a large loose-end tie.

Technician Smith is discovered exposing a fly's proboscis in the photo-micrographic camera.

Enter, Impression Jones.

Imp. Jo.: "I thought I'd just call———"

Tech. Sm.: "Sit down, don't move, don't speak, don't breathe!" (Imp. Jo. sinks into a vacant chair, looking rather scared.)

Tech. Sm.: (After an interval) "There, I think that will about do. Most interesting subject, Jones; ah, I forgot, *your* aim is to make prints as little like photographs as possible; you don't care for technical work."

Imp. Jo.: "Well, you see, my Soul yearns for the Beautiful, the Sublime; I try, in my humble way, to produce an Effect, illustrating a Phase of Nature dominated by Mind. Our school endeavours to elevate . . . ."

Tech. Sm. (interrupting): "I know, and 'amuse, without vulgarity.' I seem to have heard the phrase before, in connection with something else, but no matter. What have you got in that brown paper parcel you are nursing so carefully?"

Imp. Jo.: "I fear it will not interest you; it is my last Result. An Effect of unconventional chiaro-oscuro producing a Breadth of Tone pleasing to the artistically educated Mind."

Tech. Sm.: "I haven't the slightest notion what you mean, but you might let me have a look at the 'Creation,' if that is the right word." (Imp. Jo. hands him the picture.)

Tech. Sm. (Holding it to the light): "Oh, come! this is really not so bad! I see you have to hold these things at just the right distance to catch the effect. (Turning the mount to various angles.) The mare and foal stand out capitally against the background of firs, and . . . . ."

Imp. Jo. (much hurt): "Mare and Foal? Background of firs? What *do* you mean? That picture is a much admired impression of a hay barge passing under London Bridge, and, oh, I say! it's too bad, you're holding it upside down!"

Tech. Sm.: "Am I? I'm *so* sorry; but you really should label your works, "This side up."

Imp. Jo.: "I cannot say how it pains me when you talk in that flippant manner. I have even heard you jeer at our revered Master's unspeakably beautiful pictures, so full of glamour and poetry."

Tech. Sm.: "If you mean Smudgio by the 'Master,' I tell you plainly, if I found myself getting to like *one* of his so-called photographs, I should see a Doctor. Why, they are absolutely untrue to nature!"

Imp. Jo.: "Nature is good, but intellect is better; as the Law-giver is before the Law-receiver."

Tech. Sm.: "You can't alter my opinions by firing off, probably incorrect, quotations. Now, I have some *real* photographs here I should like you to look at; they, at least, don't purport to be badly executed chalk drawings."

Imp. Jo. (Takes prints, glances at them, and shudders): "These glazed prints cause a sensitive nature like mine actual physical pain."

Tech. Sm.: "That's all rot! you *must* use glazed paper to show up detail."

Imp. Jo. (In a voice of anguish): "Detail."

Tech. Sm.: "Yes, detail. Don't you see the prints represent—I flatter myself—an excellent series of the different workings of a coal mine?"

Imp. Jo.: "A coal mine is it? but how material! I know you *can* do more satisfying work than this. I was, I must allow, surprised to find a really *nice* effect at the 'Earnest Seeker's' Exhibition that bore your name. The tonality was ——— (He looks round and sees Tech. Sm. convulsed with laughter.) "What are you laughing at?"

Tech. Sm.: "Ha, ha, this is delicious! I really must sit down and tell you all about that work of art. Last autumn I illustrated an article on sheep-farming for a man. One afternoon I was photographing a flock of sheep with a 'bull-finch' hedge as a background. I had just commenced to expose when the wind blew over the camera, which, luckily, I caught before it quite reached the ground. Just for a joke I developed the plate, reversed it in the printing frame—that is to say, put it with the film side out—printed it on extremely rough paper; made from part of an old packing-case, a frame, which I stained green; and I entitled the result a "Storm at Sea!" Since then it has been hung at three exhibitions, and, I hear to-day, it has been purchased for £3 3s. Ha, ha, ha!"

Imp. Jo.: (Much disgusted): "But it was a fraud, and the title a—a lie!"

Tech. Sm.: "Not a bit of it. There probably was a storm at sea on that afternoon, for it blew hard enough on land!"

Imp. Jo. (With outraged dignity): "I *had* hoped your Soul was only dormant, but I now fear it will *never* Awake to the Immensity of the Sublime." (Exit, with brown paper parcel.)

Tech. Sm.: "Pickles!"

Curtain.

T. A. Gerald Strickland.

MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

To the "British Journal of Photography." *March* 1, 1901.

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ALLOTROPIC SILVER.

Early in the year 1886 I took up the study of the reduction products of silver in connexion with that of the protosalts. I commenced with Wöhler's process, giving it up after a few trials as affording no satisfactory results, and sought for a more reliable means. This I found (in March, 1886), in a reaction which I still use, namely, the reduction of silver citrate by ferrous citrate. At first, however, the results obtained were most enigmatical, the products very unstable and impossible to purify. Much time was lost, and the matter was given up more than once as impracticable. Eventually, by great modifications in the proportions, stable products, and capable of a fair amount of purification, were got. Even the earlier and less pure forms were beautiful; the purer are hardly surpassed by any known chemical products.

The forms of allotropic silver which I have obtained may be classified as follows:—

A. Soluble, deep red in solution, matt-lilac, blue or green while moist; brilliant bluish-green metallic when dry.

B. Insoluble, derived from A, dark reddish-brown while moist; when dry, somewhat resembling A.

C. Gold-silver; dark bronze whilst wet; when dry exactly resembling metallic gold in burnished lumps.

Of this form there is a variety which is copper-coloured, insoluble in water, and appears to have no corresponding soluble form.

Properties possessed by all the varieties in common, and distinguishing them all from Normal Silver.

All these forms have several remarkable properties in common.

1. *That of drying with their particles in optical contact, and consequently forming a continuous film.*—If either is taken in a pasty condition and is spread evenly over paper with a fine brush, it takes on spontaneously in drying a lustre as high as that of metallic leaf. C, when so treated, would be taken for gold leaf, but this property is much better seen by brushing the pasty substance over glass. When dry, an absolutely perfect mirror is obtained. The particles next the glass, seen through the glass, are as perfectly continuous as those of mercury amalgam, and the mirror is as good. A and B form bluish-green mirrors; C, gold or copper-coloured mirrors.

2. *The halogen reactions.*—When any of these allotropic forms of silver are brushed over paper, and the resulting metallic films are exposed to the action of any haloid in solution, very beautiful colourations are obtained. The experiment succeeds best with substances that easily give up the halogen, such as sodium hypochlorite, ferric chloride, iodine dissolved in potassium iodide, &c. But indications are also obtained with alkaline salts, such as ammonium chloride, &c., though more slowly and less brilliantly. With sodium hypochlorite the colours are often magnificent, intense shades with metallic reflections reminding one of the colours of a peacock's tail. Blue is the predominating tint. These are interference colours, caused by thin films; but whether of a normal silver haloid or a hemi-salt cannot be said. When silver leaf (normal silver) is fastened to paper and a trial made, the contrast is very striking. This matter will be more particularly examined in the second part of this paper, and is mentioned here as one of the reactions distinguishing allotropic from ordinary silver.

3. *The action of Acids.*—The stronger acids, even when much diluted, instantly convert the allotropic forms of silver into normal grey silver; even acetic acid, not too much diluted, does this. It is important to remark that this change takes place absolutely without the separation of gas. I have more than once watched the whole operation with a lens, and have never seen the minutest bubble escape.

4. *Physical condition.*—All these allotropic forms of silver are easily reduced to an impalpable powder. One is surprised to see what is apparently solid burnished metal break easily to pieces, and by moderate trituration yield a fine powder.

A.—Soluble Allotropic Silver.

A solution of ferrous citrate added to one of a silver salt produces instantly a deep red liquid (ferrous tartrate gives the same reaction but is less advantageous). These red solutions may either exhibit tolerable permanency, or may decolourise, letting fall a black precipitate. It is not necessary to prepare the ferrous salt in an isolated form, a mixture of ferrous sulphate and sodic citrate answers perfectly.

When, however, concentrated solutions are used with a large excess of ferrous sulphate and a still larger one of alkaline citrate, the liquid turns almost completely black. It should be stirred very thoroughly for several minutes, to make sure that the whole of the precipitated silver citrate is acted upon by the iron. After standing for ten or fifteen minutes the liquid may be decanted, and will leave a large quantity of a heavy precipitate of a fine lilac-blue colour. It is best to adhere closely to certain proportions. Of a ten per cent. solution of silver nitrate, 200 c.c. may be placed in a precipitating jar. In another vessel are mixed 200 c.c. of a thirty per cent. solution of pure ferrous sulphate, and 280 c.c. of a forty per cent. solution of sodic citrate. (The same quantity of ferrous sulphate or of sodic citrate in a larger quantity of water will occasion much loss of the silver product.) I think some advantage is gained by neutralising the ferrous solution, which has a strong acid reaction, with solution of sodium hydroxide, as much may be added as will not cause a permanent

precipitate. To the quantities already given add about 50 c.c. of a ten per cent. soda solution. The reaction takes place equally well without the soda, but I think the product is a little more stable with it. The mixed solution is to be added at once to the silver solution.

The beautiful lilac shade of the precipitate is rather ephemeral. It remains for some time if the precipitate is left under the mother water; but when thrown upon a filter it is scarcely uncovered before the lilac shade disappears, and the precipitate takes a deep blue colour without losing its solubility. It may be washed either on a filter or by decantation with any saline solution in which it is insoluble, and which does not affect it too much. On the whole, ammonic nitrate does best, but sodic-nitrate, citrate, or sulphate may be used, or the corresponding ammonia salts. Although in pure water the precipitate instantly dissolves with an intense blood-red colour, the presence of five or ten per cent. of any of these salts renders it perfectly insoluble. I have usually proceeded by adding to the precipitate (after decanting the mother water as completely as may be, and removing as much more with a pipette) a moderate amount of water; for the above quantities about 150 c.c. Much less would dissolve the precipitate but for the salts present; this much will dissolve the greater part, but not the whole, which is not necessary. A little of a saturated solution of ammonic nitrate is added, just enough to effect complete precipitation.

As the material appears continually to change, the amount of washing needed must depend on the object in view. If wanted for analysis, the washing must be repeated many times until ferric salt ceases to come away, but no amount of washing will entirely eliminate it. After seven or eight solutions in pure water, and as many precipitations, the material is to be thrown on a filter, the liquid forced out as completely as possible with a pump, and then the ammonic nitrate washed out with ninety-five per cent. of alcohol until the filtrate leaves nothing on evaporation. The substance at this point is still soluble, though much less so than at first. During the washing the solubility slowly but steadily diminishes, a fact rendered noticeable by less and less ammonic nitrate being required to precipitate it from its solution.

Analysis.—The product, after thorough washing, as above described, with alcohol, was dried at ordinary temperatures or a little above, and was then reduced to very fine powder, and washed again with water as long as anything dissolved. It was then dried at 100° C. in a water bath. Three silver determinations were made:—

A_1	97·31	per cent.	silver.
A_2	97·18	„	„
B	97·21	„	„

A_1 and A_2 were made with different portions of the same material; B with different material prepared in exactly the same way.

The substance, therefore, contained on an average 97·27 per cent. of silver. The nature of the residue would decide whether the material was silver with a certain amount of impurity firmly attached to it, or whether we had to do with silver in chemical combination with other elements.

The filtrate from the silver chloride in analysis A_2 was evaporated to dryness, and was found to contain chiefly iron and citric acid. The iron was thrown down as sulphide, redissolved in nitric acid, precipitated hot, washed with boiling water, and gave 0·8947. The residue, therefore, consisted of ferric oxide and citric acid, probably in the form of ferric citrate, and attached so strongly that even the very careful and prolonged washings given failed to remove them. Stronger means would be required than could be used without altering the condition of the substance. The conclusion, therefore, seemed to be justified that the material consisted of uncombined silver mixed simply with impurity.

To verify this conclusion by additional evidence, the substance was examined as to its behaviour when heated. For if any other element were chemically combined with the silver, it would only be (in view of the high percentage of silver) hydrogen or oxygen. We might have to do with a hydride, analogous to Wurtz's hydride of copper; or possibly an oxide; but not probably, as Ag_4O would contain only 96·43 per cent. of silver.

The presence of either hydrogen or oxygen in combination with silver seems to be pretty certainly negatived by the action of dilute sulphuric acid on this (and the other two substances, B and C, to be described farther on). They are all converted into grey metallic silver without the slightest escape of gas. This seems tolerably conclusive in itself, and the result of exposing a great number of specimens of all the forms A, B, and C to the action of heat was equally so. As the object was to expose the fresh and moist material to a gradually increasing heat, from that of boiling water to a low red heat without interrupting the process, the following arrangement was found convenient:—

A piece of Bohemian glass tube about six inches long was sealed in the lamp at one end; the other closed with a rubber cork, through which passed a small gas delivery tube; and another tube passing into a small test tube partly filled with water, and having another tube through the cork passing under the surface of the water, thus preventing regurgitation. The material was thus first exposed for some hours to a heat of about 150° C. in a chloride of calcium bath; this was next removed, and the heat continued to low redness. Only traces of gas were evolved, and this was found to be, in all of the many trials made, carbonic acid, derived from the citric acid, adhering. This treatment was repeated many times with all the different varieties of the substance, and with the same result. The temperature was always raised sufficiently high to ensure the complete conversion of the material into normal grey silver, but in no case was oxygen or hydrogen set free.

It could not be overlooked that in all these trials the material had passed into an insoluble form before the silver determination was made. There remained, therefore, this possibility, that the silver, so long as soluble, might be in combination with citric acid, and that its change to the insoluble condition was caused by its separating from the citric acid. It seemed desirable that this view should be tested. As the object was to determine the condition of the silver in the substance as originally formed, avoiding, as far as possible, to change that form by attempts at purification, the only course available was to determine the ratio between the silver on the one hand and the citric acid on the other, either excluding from the determination, or else removing, that portion of the citric acid which was combined with sodium (sodic citrate being used in excess) or with iron. The first attempt was to exclude without removing it, by using Wolcott Gibb's ingenious method of precipitating the base by hydrogen sulphide, and determining the acid thus set free in a solution originally neutral. It was ascertained by careful experiment on weighed quantities of pure anhydrous citric acid that exact filtration could be made with the aid of phenolphthalein. The silver was next redissolved and estimated as chloride. A large number of determinations were made, but the method proved unsatisfactory. It was found that portions of the same material operated upon separately gave different (even widely different) results. In fact, this very discordance was in itself a proof that no stoichiometrical combination existed between the silver and the citric acid.

The importance of the matter led me to take it up again with different means, estimating the citric acid by Creuse's method. In this method the solution, after being reduced to a small bulk, is exactly neutralised (with ammonia or citric acid), is tested with a slight excess of barium acetate, and then mixed with twice its bulk of ninety-five per cent. alcohol, let stand a day, and filtered and washed with sixty-five per cent. alcohol. In igniting, a few drops of sulphuric acid convert the barium salt into sulphate, in which form the estimation is made. A preliminary trial with a weighed quantity of citric acid showed that this method gave fairly good results. I was obliged to vary the method somewhat; the precipitate of barium citrate carried down with it enough iron to render it ochrey in appearance. It was, therefore, after thorough washing with sixty-five per cent. alcohol till every trace of barium acetate was removed, dissolved on the filter with dilute hydrochloric acid (acid 1, water 10), in which barium citrate is extremely soluble, and washed through. This was followed by still weaker acid, and finally with water. From the filtrate, sulphuric acid precipitated snow-white barium sulphate.

But this method requires that both the sulphates and the excess of sodic and ferric citrate shall first have been perfectly removed. The blue precipitate was therefore washed with dilute solution of

ammonic nitrate until this was effected. The necessity for this purification was regrettable as introducing a possibility of a change during the treatment. It was, however, indispensable that the ferrous, ferric, and sodic citrates should be got rid of. The material after this treatment was still freely soluble in water, to a dark-red solution. An examination of its absorption spectrum showed it to be still a true solution. From this solution the silver was first removed by H_2S, and then the citric acid was determined in the above described way. (If the silver were thrown down by hydrochloric acid, the reliability of the citric determination would be impaired.) Next, the silver sulphide was converted into chloride and weighed.

The result gave the ratio :—

1 gramme silver to ·03195 gramme citric acid.

In this case, washing out the sulphates, &c., was an affair of several days. The work was repeated, reducing the time as much as possible. The material was precipitated, decanted as soon as settled, thrown upon a filter pump, and the funnel kept constantly full of ammonic nitrate in dilute solution by a wash bottle. By using very thick paper and a powerful pressure the entire washing was rapidly finished, so that in about six hours from first precipitation the material was thoroughly washed, redissolved, and again filtered, and placed under the action of H_2S. The result was—

1 gramme silver to ·0130 citric acid.

When these relations are reduced from weights to equivalents, they become :—

No. 1. 1 equiv. citric acid to 55·63 equiv. silver.
No. 2. 1 „ „ 193·7 „ „

indicating both that the proportion of citric acid present is variable, and that it is certainly not in stoichiometrical combination with the silver in the substance examined.

It has already been said that these solutions, before being acted upon by H_2S, were optically examined and found to be true solutions. The inference, therefore, seems to be very strong that there exists an allotropic form of silver freely soluble in water. This is a property so exceptional in a metal that I have admitted it with much hesitation. The principal arguments are as follows :—

The content of silver in the various products was very carefully, and I believe I may say quite accurately, determined. It was extremely high, always above ninety-seven per cent. As already remarked, this virtually excludes the presence of all elements except hydrogen and, possibly, oxygen. These elements were carefully searched for; but their presence could not be detected. To suppose that we had to do with a mixture in which some compound of silver was mixed with metallic silver was not possible; for, as the whole was soluble, we should still have to admit the solubility of silver.

We have consequently to deal with a substance containing over ninety-seven per cent. of silver, and neither hydrogen nor oxygen in combination with it, the remaining two or three per cent. fully accounted for by ferric oxide and citric acid, determined as present as accidental impurity, the substance itself readily amalgamating with mercury by simple friction, nevertheless abundantly soluble in water. If I had been able to find any other explanation for these facts without admitting the solubility of silver I should have adopted it. But none presented itself.

Whether in solution it exists as a hydrate, that is, in more intimate combination with one or more equivalents of water, cannot be said with entire certainty; but the easy amalgamation with mercury seems hardly to favour that view. No means could be found for settling the question absolutely. Certainly at 100° C. all water is expelled, but this of course is not an argument. All the water is not expelled by indefinite exposure to a vacuum over sulphuric acid, but the proportion left is very small.

The material examined was in all cases as nearly as possible the same as that originally precipitated, but absolute identity could not be obtained. The purification absolutely necessary effects some change. This is shown by the colour. The freshly precipitated material dissolves to a blood-red liquid; by great dilution, yellowish red. The purified substance gives a darker red, which with dilution remains still red. Of the nature of the substances in the condition in which they were analysed I can speak with some positiveness, and these include a substance soluble in water and nevertheless appearing to be nearly pure silver.

The constitution of the lilac-blue substance at the moment of formation, and whilst under its mother water, is a matter of much more difficulty; it could not be said with certainty that it was not in some way altered in the purification. Much time and labour were spent in endeavouring to settle this point, without entirely satisfactory results, and I am at present engaged in the search for a better method.

When this blue soluble substance—purified either by washing very moderately by ammonium nitrate, or by washing with pure water, using those portions which remain undissolved after most has been carried through the filter—is brushed over paper and dried rapidly, it exhibits a very beautiful succession of colours. At the moment of applying it appears blood red; when half dry it has a splendid blue colour with a lustrous metallic reflection; when quite dry this metallic effect disappears, and the colour is matt blue. Examined with a polariser it shows the same characters as to two reflected beams of light polarised in planes perpendicular to each other that are described further on under B.

When the blue substance prepared in either way dries more slowly in lumps, the result is very variable: sometimes it is bright bluish metallic; sometimes dull lead colour, with a metallic reflection only where it has dried in contact with a smooth surface.

B.—Insoluble Form of the Foregoing.

The solution of the blue product just described is influenced in a remarkable way by the addition of almost any neutral substance. So far I have not found any that do not precipitate it. Not only saline solutions do this, but even a solution of gum arabic.

Neutral salts may precipitate the silver in either a soluble or an insoluble form. Alkaline sulphates, nitrates, and citrates throw down the soluble form; magnesium sulphate, ferrous sulphate, nickel sulphate, potassium bichromate and ferrocyanide, barium nitrate, even silver nitrate and other salts, throw down a perfectly insoluble form. The soluble form constitutes a blue or bluish-black precipitate; the insoluble a purple brown, which by repeated washing, by decantation, or otherwise, continually darkens.

What is very curious is that the insoluble form may be made to return to the soluble condition. Many substances are capable of effecting this change. Sodium borate does so, producing a brown solution; potassium and sodium sulphate produce a yellowish red solution, and ammonium sulphate a red one. None of these solutions have the same blood-red colour as the original solution; the form of silver seems to change with the slightest change of condition.

The solutions used must be extemely dilute, otherwise the silver, though rendered soluble in pure water by them, will not dissolve in the solution itself, a singular complication of effects. So that if a moderately strong solution of one of the above substances is poured over the insoluble silver substance it does not dissolve; but by pouring off the saline solution and replacing it with pure water the substance dissolves readily. The insoluble substance is also readily soluble in ammonia. The solution has a fine red colour, and not the yellowish red of the sodium sulphate solution.

Most neutral salts act in one or other of the ways just described, precipitating the solution of the blue substance, A, in either the soluble or the insoluble form; the latter soluble in ammonia. But sodium nitrate is an exception; its solution effects an entire change, and renders the substance wholly insoluble, probably reconverting it into normal silver.

Sometimes the substance will spontaneously pass into a soluble form. A specimen, rendered insoluble by precipitation with ferrous sulphate, after much washing began to run through, not only as a suspension, which often happens, but as a solution, clearing itself after a day or two of insoluble portions, and furnishing a rose-red solution. I have kept this solution in a corked vial for eight months, during which time it has remained unchanged.

The general properties of this substance can be much better observed in the thin films obtained by brushing the moist substance

over paper than in the lumps. The films thus obtained are bright greenish metallic, and this green evidently results from a mixture of blue and yellow, as in some lights the blue, in others the yellow, is most evident. When these films are examined by light reflected from them at a large incidence with the normal, and a Nicol's prism or an achromatised prism of calc spar is interposed between the film and the eye, it becomes at once apparent that the blue and yellow light are oppositely polarised. The yellow light is polarised in the plane of incidence, the blue light perpendicularly to that plane. All specimens show the yellow light; but the quantity of blue light is very variable, and is directly connected with the amount of washing applied to the precipitate. The more it is washed, the more the yellow predominates. To see the blue form in its full beauty, a little of the red solution may be precipitated with a very little magnesium or aluminic sulphate, and be thrown on a filter. As soon as the liquid has drained off, and without any washing, the deep bronze-coloured substance is to be brushed over paper. On drying, it has all the appearance of a bright blue metal with a remarkable lustre. The mirrors obtained by brushing the substance over glass are so beautiful and so perfect that it seems as if this property might have useful applications, especially for silvering irregular surfaces. Much care, however, would be necessary in the preparation to obtain a permanent product.

Crystallisation.—On one occasion this substance was obtained in a crystalline form. Some crude red solution had been set aside in a corked vial. Some weeks after, it was noticed that the solution had become decolourised, with a crystalline deposit at the bottom. The bottle was carefully broken; the deposit, examined by a lens, consisted of short black needles and thin prisms. Evidently the saline matters present had balanced the silver in solution so nearly as not to cause an immediate precipitation, but a very gradual one only. The mother liquor was drained off, and a few drops of pure water added. No solution took place; the crystals were, therefore, of the material B, the insoluble form. The contact of pure water instantly destroyed the crystallisation, and the substance dried with a bright green metallic lustre. Contact with pure water evidently tends always to bring this form of silver into the colloidal state, sometimes soluble and sometimes not; whilst the contact with certain neutral salts renders it crystalline.

The extraordinary sensitiveness which allotropic silver shows to external influences contrasts strongly with the inertness of normal (probably polymeric) metallic silver. When we place this fact alongside of the well-known sensitiveness of many silver compounds to light, heat, and (as I have elsewhere shown) to mechanical force, we are led to ask whether silver may not exist in this form in these very sensitive compounds.

To obtain the substance in a pure condition suitable for analysis, it is necessary to choose a precipitant not giving an insoluble product with either citric or sulphuric acid. Magnesium sulphate or nickel sulphate answers well; I have generally used the first named. A very dilute solution is made of it, and the red solution of A is to be filtered into it. The precipitate soon subsides. A large quantity of water is to be poured on, and then washing by decantation can be continued to three decantations, after which the substance remains suspended. It can be made to subside by adding a very small quantity of magnesium sulphate; one four-thousandth (0·25 gramme to one litre) is sufficient. The substance may then be thrown on a filter and washed with pure water.

Analysis.—A specimen dried in vacuo over sulphuric acid gave:—

No. 1	97·17 per cent. silver.
No. 2	97·10 „ „

A specimen dried first in vacuo, and then at 100° C., lost in the second drying ·88 per cent. water.

So that the substance dried at 100° contained 97·96 per cent. of silver. The remaining 2·04 per cent. consisted of ferric oxide and citric acid.

C.—Gold-yellow and Copper-coloured Silver.

It has long been known that golden-yellow specks would occasionally show themselves in silver solutions, but could not be obtained at will, and the quantity thus appearing was infinitesimal. Probably this phenomenon has often led to a supposition that silver might be transmuted into gold.* This yellow product, however, is only an allotropic form of silver; but it has all the colour and brilliancy of gold, a fact which was apparent even in the minute specks hitherto obtained.

By the means presently to be described, silver can be converted wholly into this form. It is a little curious that its permanency seems to depend entirely on details in the mode of formation. I have found many ways of obtaining t, but in a few months the specimens preserved changed spontaneously into normal silver. This happened even in closed tubes. The normal silver produced in this way is exquisitely beautiful. It has a pure and perfect white colour like the finest frosted jeweller's silver, almost in fact exceeding the jeweller's finest products. I found, however, one process by which a quite permanent result would be obtained. Specimens made by it in November of 1886 were, at the end of thirty months, unchanged.

In forming the blue product which I have called A, very concentrated solutions were necessary. C on the contrary, is best obtained from very dilute ones. The following proportions give good results:—

Two mixtures are to be prepared. No. 1, containing 200 c. c. of a ten per cent. solution of silver nitrate, 200 c. c. of a twenty per cent. solution of Rochelle salt, and 800 c. c. of distilled water.

No. 2, containing 107 c. c. of a thirty per cent. solution of ferrous sulphate, 200 c. c. of a twenty per cent. solution of Rochelle salt, and 800 c. c. of distilled water.

The second solution (which must be mixed immediately before using only) is poured into the first with constant stirring. A powder, at first glittering red, then changing to black, falls, which on the filter has a beautiful bronze appearance. After washing, it should be removed whilst in a pasty condition, and spread over watch glasses or flat glass basins, and allowed to dry spontaneously. It will be seen that this is a reduction of silver tartrate by ferrous tartrate. The metallic silver formed by reduction with ferrous citrate and ferrous tartrate is in an allotropic condition; with ferrous oxalate this result does not seem to be produced.

Although the gold-coloured silver (into which the nitrate used is wholly converted) is very permanent when dry, it is less so when wet. In washing, the filter must be kept always full of water; this is essential. It dries into lumps exactly resembling metallic gold, especially the surfaces that have dried in contact with glass or porcelain. For this substance has in a high degree the property already described in forms A and B—that of drying with the particles in optical contact. When the thick pasty substance is extended over glazed paper, it dries with the splendid lustre of gold leaf, with this essential difference, that these allotropic forms of silver, B and C, assume spontaneously in drying the high degree of brilliancy which other metallic surfaces acquire by elaborate polishing and burnishing. By brushing a thick paste of this substance evenly on clean glass, beautiful gold-coloured mirrors are obtained; the film appears to be entirely continuous and the mirror is very perfect.

By continued washing the precipitate changes somewhat, so that in drying it takes on a coppery rather than a golden colour, and is rather less lustrous, though still bright and permanent.

Two silver determinations by conversion into chloride made in November, 1886, gave:—

No. 1	97·81 per cent. silver.
No. 2	97·86 „ „

Recently these experiments have been repeated, and the washing was more successful. Ferric tartrate adheres very obstinately, and after a time washing with water ceases to remove it. Stronger

* I have a little volume, published in Paris in 1857, by a chemist named Tiffereau, who was firmly convinced that in many reactions minute portions of silver are converted into gold, especially with the aid of powerful sunlight. In Mexico, he affirmed, he had artificially produced several grammes of gold, a portion of which he presented to the French Academy with one of his papers. To his great disappointment he did not succeed in repeating these experiments in Paris with more than an infinitesimal result. All gold, in his opinion, had been originally silver; and this belief, he affirms, is universal amongst Mexican miners. The book has for a title, *Les Métaux sont des Corps composés.*

means cannot be employed without affecting the substance itself, These last determinations gave:—

No. 1 ..... 98·750 per cent. silver.
No. 2 ..... 98·749 „ „

The residue of No 2. was examined, and consisted almost wholly of ferric citrate.

The two insoluble forms of allotropic silver which I have described as B and C (B, bluish green; C, rich golden colour) show the following curious reaction. A film of B spread on glass and heated in a water stove to 100° C. for a few minutes becomes superficially bright yellow; a similar film of the gold-coloured substance C, treated in the same way, acquires a blue bloom. In both cases it is the surface only that changes.

Sensitiveness to Light.—All these forms of silver are acted upon by light. A and B acquire a brownish tinge by some hours' exposure to sunlight. With C the case is quite different, the colour changes from that of red gold to that of pure yellow gold. The experiment is an interesting one, the exposed portion retains its full metallic brilliancy, giving an additional proof that the colour depends upon molecular arrangement, and this with the allotropic forms of silver is subject to change from almost any influence.

Stability.—These substances vary greatly in stability under influences difficult to appreciate. I have two specimens of the gold-yellow substance C, both made in December, 1886, with the same proportions under the same conditions. One has passed to dazzling white, normal silver, without falling to powder or undergoing disaggregation of any sort, the fragments have retained their shape, simply changing to a pure frosted white, remaining apparently as solid as before; the other is unchanged, and still shows its deep yellow colour and golden lustre. Another specimen, made within a few months and supposed to be permanent, has changed to brown. Complete exclusion of air and light is certainly favourable to permanence.

Physical Condition.—The brittleness of the substances B and C, the facility with which they can be reduced to the finest powder, makes a striking point of difference between allotropic and normal silver. It is probable that normal silver, precipitated in fine powder and set aside moist to dry gradually, may cohere into brittle lumps, but these would be mere aggregations of discontinuous material. With allotropic silver the case is very different, the particles dry in optical contact with each other, the surfaces are brilliant, and the material evidently continuous. That this should be brittle indicates a totally different state of molecular constitution from that of normal silver.

Specific Gravities.—The allotropic forms of silver show a lower specific gravity than that of normal silver.

In determining the specific gravities it was found essential to keep the specific gravity bottle, after placing the material in it, for some hours under the bell of an air-pump. Films of air attach themselves obstinately to the surfaces and escape but slowly even in vacuo.

Taken with this precaution, the blue substance B gave specific gravity 9·58, and the yellow substance C, sp. gr. 8·51. The specific gravity of normal silver after melting was found by G. Rose to be 10·5. That of finely-divided silver obtained by precipitation is stated to be 10·62.*

I believe these determinations to be exact for the specimens employed. But the condition of aggregation may not improbably vary somewhat in different specimens. It seems, however, clear that these forms of silver have a lower specific gravity than the normal, and this is what would be expected.

It was mentioned previously that the red gold-coloured modification of silver was converted into a bright yellow-coloured form by the action of light. Continued exposure seems to produce little further change so long as the substance is dry. But if the paper on which the silver is extended is kept moist by a wet pad, with three or four days of good sunshine, the change goes on until the silver becomes perfectly white and is apparently changed to normal silver; †

* Watts' Dict., original edition, V. p. 227.

† The pad used was of unbleached muslin, which was boiled several times with distilled water to remove everything soluble before use.

water, alone, tends to darken this form of allotropic silver, accordingly the portion of the paper that was protected for comparison, darkened, showing that the whitening effect was due wholly to light.

It thus appears that light can convert yellow or red-yellow allotropic silver to white.

Some pieces of the very bright blue-green modification were exposed to light, and with about one day's bright sunshine they passed to a pure metallic gold colour.

It appears, therefore, that light can cause the blue-green modification to pass to the gold-yellow.

This change only occurs with a very brilliant form of the bluish-green substance, which is obtained with a quick, short washing. Specimens slowly and very thoroughly washed, which when brushed over paper gave a more matt colour, did not yield this result, but became brownish. Nor can this result be obtained with the soluble form of allotropic silver described.

Light, therefore, can change the bluish-green to the yellow modification, and this last (with the aid of moisture) to white normal silver. The silver thus obtained is pure white, lustrous, and metallic, resembling silver leaf. Organic compounds of silver reduced by light give grey or black silver devoid of lustre.

The three forms of allotropic silver—the blue soluble and the blue and the yellow insoluble—are not to be understood as the only forms which exist, but as the best-marked only. The substance is protean, and exhibits other modifications not yet studied. No other metal than silver appears to be capable of assuming such a remarkable variety of appearances. Every colour is represented. I have obtained metallic silver, blue, green (many shades of both), red, yellow, and purple. In enumerating these colours I do not refer to interference colours produced superficially by reagents, also wonderfully brilliant, but to body colours. As a single instance of colouration the following may be mentioned. I recently obtained a solution of allotropic silver of an intense yellow-brown. A little solution of disodic phosphate changed this to bright scarlet (like Biberich scarlet), presently decolourising with formation of a purple precipitate. Washed on a filter this changed to bluish-green. The colours I have met with in this investigation can only be compared with the coal-tar products, of which one is constantly reminded by their vividness and intense colorific power.

Two of the insoluble forms of allotropic silver, the gold-coloured and the blue, show in many respects a close relationship and almost identical reactions. There are other respects in which they differ strikingly, and amongst these instability. Blue allotropic silver (dark red whilst moist, becoming blue in drying) is very stable. It may be exposed for weeks in a moist state on a filter, or be placed in a pasty condition in a corked vial, and so kept moist for months without alteration.

The gold-coloured form, on the contrary, tends constantly to revert to ordinary silver. This is especially the case whilst it is moist, so that from the time of its formation it must be separated from its mother water, and washed as rapidly as possible, otherwise it loses its brilliancy and purity of colour, and changes to a dark, dull, grey form of normal silver. On the filter its proper colour is pure black, with a sort of yellow shimmer (the gold colour appearing as it dries); often, especially if allowed to become uncovered by the water during washing, it will change superficially to grey.* But if the washing is done rapidly, with the aid of a filter pump and a pressure of four or five inches of mercury, the allotropic silver obtained, when allowed to dry in lumps, or brushed over paper or glass, is at least equal to pure gold in colour and in brilliancy. With the blue powder such precautions are wholly superfluous.

Of the facility with which the gold-coloured form is converted into normal silver, I have recently had a somewhat singular proof. I brought with me to my summer home a number of specimens in tubes, some recently prepared, some dating back as far as ten and a half years, together with other tubes containing specimens of white silver spontaneously formed from the gold-coloured. On

* When well washed, this form can also be preserved, for a time, in the moist condition in a corked vial, as I have lately found.

opening the box no tubes of gold-coloured silver were to be found; all had changed to white. But the same box contained pieces of paper and of glass on which the same material had been extended; these were wholly unchanged, and had preserved the gold colour perfectly. Apparently the explanation was this—the mere vibration caused by the jarring of a journey of six hundred miles by rail and steamboat had had no effect in changing the molecular form, but the material contained in the partly filled tubes had been also subjected to *friction* of pieces moved over each other, and this had caused the change. To verify this explanation I prepared fresh material, filled three similar tubes, each one-quarter full, but in one forced in cotton wool very tightly to prevent frictional motion. These tubes were packed in a small box and sent over two thousand four hundred miles of railway. The tubes with loose material came back much altered. One was nearly white, and, as the change had been set up, will probably in a few years be entirely so;* another with loose material was also changed, but not as much as the first mentioned. The tube filled up with cotton came back unaltered, so that continued friction of pieces sliding over each other will cause a change to take place in a few days, which otherwise might have required years, or might not have occurred at all. The permanency of this substance is greatly influenced by moisture, so that when simply air-dried before placing it in tubes it is less permanent than when dried at 70° or 80° C. in a stove. Tubes placed in the same box containing the blue form remained unaffected by the motion, though only partly filled and allowed to move freely.

When gold-coloured allotropic silver is gently heated in a test tube it undergoes a remarkable change in cohesion. Before heating, it is brittle and easily reduced to fine powder. After heating, it has greatly increased in toughness, and cannot be pulverised at all.

Both the gold-yellow and the blue forms resemble normal silver in disengaging oxygen from hydrogen peroxide. These two forms, though differing so much in colour and stability, and differing also in specific gravity, and in their mode of formation, have many properties in common, not possessed by ordinary silver, and differentiating them strongly from it. They show a vastly greater sensitiveness to reagents, and are also sensitive to light. The ability to form perfect metallic mirrors by being simply brushed in the pasty condition over glass has been mentioned.

Many substances which react little, if at all, with ordinary silver, attack the gold-coloured and the blue allotropic silver, with production of very beautiful colours due to the formation of thin films and resulting interference of two reflected rays. In my previous papers I called this the "halogen reaction," because first obtained by the action of substances which easily parted with a halogen. But I have since found that many other reagents will produce the same or similar effects. These are:—

Sulphides.—Paper brushed over with either the gold, the copper-coloured, or the bluish-green substance exposed to the vapour of ammonium sulphide, or immersed in a dilute solution of it, assumes beautiful hues, though less brilliant than those obtained in some other ways.

Potassium Permanganate in dilute solutions produces blue, red, and green colours.

Potassium Ferricyanide in moderately strong solution gradually attacks allotropic silver with production of splendid blue, purple, and green colouration.

Phosphorous Acid produces gradually a rather dull colouration.

The colour reaction is produced finely by substances which readily part with a halogen—such as ferric and cupric chlorides, sodium hypochlorite, hydrochloric acid to which potassium bichromate has been added—and by corresponding bromine and iodine compounds. In some earlier experiments I obtained effects of the same sort, but in much weaker degree, with alkaline haloids. But with purer products the results have been different. There is at first some darkening, but no true colour reaction, and the allotropic silver appears to be gradually converted into normal, so that it is no longer capable of giving the brilliant colour reaction with potassium ferridcyanide, but, like normal silver, takes a pale and faint colouration only.

M. Carey Lea.

* Had since become so.

THE RADIO-ACTIVITY OF MATTER.

[For the following short account, which in the words of the author "shows that a new order of phenomena has arisen from the study of a new property of matter—radio-activity"—we are indebted to "Nature" of February 21.]

At the commencement of the year 1896, in carrying out some experiments with the salts of uranium, the exceptional optical properties of which I had been studying for some time, I observed that these salts emitted an invisible radiation, which traversed metals and bodies opaque to light, as well as glass and other transparent substances. This radiation impressed a photographic plate and discharged from a distance electrified bodies—properties giving two methods for studying the new rays.

The phenomenon does not appear to be influenced by any known external cause, such as a variation of temperature or a luminous excitation; it is entirely different from phosphorescence; is not weakened in an appreciable manner by time, even at the end of several years; and is emitted spontaneously without any apparent exciting cause. The radiating property appeared, firstly, to be bound up with the presence of the chemical element, uranium; the metal discharges electrified bodies three to four times faster than its salts.

If some fragments of uranium or of one of its salts are placed upon a photographic plate wrapped in black paper or covered by an aluminium leaf, and if between the uranium and the plate various substances are interposed, there is obtained at the end of several hours or days, radiographs showing that the radiation is propagated in straight lines, and traverses different bodies unequally. In the radiographs the edges of the plates of glass, or of thin plates of other substances, throw a sort of shadow, which is still unexplained. This phenomenon, as well as an inequality obtained twice accidentally through parallel and crossed tourmalines, led to the belief at the commencement of these researches that these rays had properties in common with light. But all the later experiments have shown that the new radiation undergoes neither reflection, refraction, nor polarisation.

The uranium radiation dissipates with equal rapidity either positive or negative electric charges; the effect is unequally transmitted through screens of different materials according to their nature and according to the order in which they have been simultaneously interposed. This fact leads to the prediction of the heterogeneity of the radiation. The dissipation of the charges of an electrified body submitted to the uranium radiation takes place through the action of the surrounding gas, which is thereby made conducting; the air keeps this property during some instants, and if, after having been influenced, it is blown on to an electrified body, the latter is discharged. A sphere of uranium remains charged if it is placed in a vacuum; in air it puts itself in equilibrium as regards potential with the surrounding space. The rate of leak increases with the potential, and, for high potentials, tends to a constant.

If two conductors are arranged at some centimetres apart, one of which is connected with a source of electricity, and if a piece of uranium is brought near, there is established between the two conductors a continuous current of electricity. Such are the principal facts that I had observed.

In 1897 Lord Kelvin and Messrs. Beattie and S. de Smolan varied the conditions of the preceding experiments, and showed that the uranium radiation established between two metals in air the same equilibrium as a drop of water which united them. In 1899 Mr. E. Rutherford made it clearly apparent that the conductibility set up in gases by uranium was due to a phenomenon of ionisation identical with that which, according to the experiments of Professor J. J. Thomson, is provoked by the Röntgen rays.

In 1898 the discovery of new radiating bodies gave a new and fruitful impulse to these studies. Mme. S. Curie and M. Schmidt had recognised that thorium possesses analogous properties to those of uranium; then Mme. Curie observed that certain uranium minerals were more active than either metallic uranium or thorium. M. and Mme. Curie concluded from this that there existed other radio-active bodies, and undertook to isolate them.

I cannot analyse here the chemical part of the fine work of M. and Mme. Curie, who, working with the electrometer as the chemist works with the spectroscope, succeeded in extracting from pitch-blende two very active substances; on the one hand, a produc

containing bismuth and a body which they called polonium; and, on the other hand, a mixture of barium and another new substance, radium.

When they had prepared some centigrammes of products the activity of which, progressively increasing, became several thousand times greater than that of uranium, M. and Mme. Curie were good enough to give me some milligrammes, so that we could thus pursue parallel researches on the new properties.

M. and Mme. Curie recognised, among other important properties, that these properties excite the fluorescence of the platinocyanides; that the salts of radium are spontaneously luminous; and further, that all bodies receiving the new radiation become radio-active in their turn, but that they gradually lose this property with time. They observed also, as well as Giesel, who prepared mixtures analogous, but less active, to those of M. and Mme. Curie, that the salts of radium increase spontaneously in activity for some time after their preparation, whilst the activity of polonium salts diminishes. The new radiation produces various chemical actions, alteration of the platinocyanides, violet coloration of glass, production of ozone, &c.

For my part, I have observed that the polonium radiation does not traverse even black paper; it is much less penetrating than that of radium, which, moreover, provokes in bodies which it encounters a secondary penetrating radiation which marks a photographic plate in the immediate neighbourhood of the points struck. I have been able to establish also that the intensity of the phosphorescence excited by radium varies as the inverse square of the distance of the excited body from the radiating source; that the unequal weakening produced by a given screen on the phosphorescence of different substances furnishes a new proof of the heterogeneity of the exciting radiation; and, lastly, that the radiation of radium restores the property of becoming phosphorescent by heat to such bodies as fluor spar, leucophane, &c., which had lost this property by preliminary heating.

I would here point out the very interesting researches of M. and Mme. Curie, M. Owens, and of Mr. E. Rutherford upon the penetrating rays of thorium. Mr. E. Rutherford has found that thorium compounds emit, in addition to this ordinary radiation, a very penetrating "emanation" that produces temporary radio-activity in substances in the neighbourhood, if the bodies are all uncharged. With charged conductors the radio-activity is produced on the negatively charged body. The radio-activity can thus be concentrated on the surface, of thin wires, and removed by hydrochloric and sulphuric acids, whose solution, when evaporated, leaves the active portion behind. Thorium may perhaps owe a part of its properties to a new element, actinium, discovered in 1900 by M. Debierne, and which is as active as radium.

At the end of 1899 several observers discovered, nearly simultaneously, that the rays from certain radiating substances were deviated by a magnetic field. This was first shown by M. Giesel with preparations of polonium and radium, then by MM. S. Meyer and E. V. Schweidler, who some days later showed the same thing with preparations made by M. Giesel, and then, a little later, without having any knowledge of these observations, I recognised that the radium radiation concentrated itself upon the poles of a non-uniform magnetic field, whilst the radiation of polonium prepared by M. and Mme. Curie is not deviated. The preparation of polonium of M. Giesel was, then, not the same substance as that of M. and Mme. Curie.

It resulted from these observations that there exists two kinds of radiations, one not capable of deviation and of which the nature is still unknown, the other capable of deviation, which later experiments have identified with the kathode rays. Somewhat later, M. and Mme. Curie recognised that both these rays co-existed in the radium radiation. The non-deviable rays are much less penetrating than the deviable rays; the polonium radiation is limited in air to a kind of sheath of some centimetres in thickness. I might add that recently M. Villard has proved the existence in the radium radiation of very penetrating rays which are not capable of deviation. M. Debierne has recognised that actinium emits some deviable rays.

I have devoted numerous experiments to the study of the deviation of radium in the magnetic field. This radiation is dispersed by the field into rays of different natures, like as light is dispersed by a prism. For each simple radiation, the trajectory in a plane perpendicular to a uniform field is a circumference of radius R, which brings back the radiation to the point of departure. If the radiation makes at the origin an angle α with the axis of the field, the trajectory is a helix rolled on a cylinder parallel to the field and of radius R sin α. The product $H\rho$ of the component of the field normal to the displacement at a point, by the radius of curvature of the trajectory in this point is constant, and may serve to characterise each simple radiation.

To obtain a beam in which each simple radiation would have a unique trajectory, a radiant source may be taken of very small diameter, the radiation being received after traversing a narrow gap in a sheet of lead. It is shown by experiment that it is sufficient to arrange between the polar pieces of an electro-magnet a horizontal photographic plate upon which is placed, in the centre of a little leaden dish, the radiating source of very small diameter. The rays emanating normally to the plate and brought back orthogonally on it are the most efficacious; the impression, large and diffuse, is thrown on one side of the field, and constitutes a sort of spectrum which is sufficiently pure. If one works in the dark, and places on the photographic plate bands of various substances, aluminium leaf, copper and platinum foil, &c., it is seen that under the screens the impression of the deviated rays is limited by elliptic arcs, distinguished from each other. Each screen arrests different radiations, the most deviated being the most absorbable. The dimensions of the elliptic arcs are in accordance with theory. The absorption is the same in air and in an absolute vacuum. These experiments constitute a sort of magnetic spectrum analysis of the deviable radiation.

The identification of this radiation with the kathode rays requires two other verifications—the demonstration of the existence of a transport of electric charges and that of a deviation in an electrostatic field. M. and Mme. Curie have made the first verification, and I have realised the second. M. and Mme. Curie placed a screen, isolated from all contact with the air, in connexion with an electrometer, and observed that the radium radiation charged this screen negatively, whilst the source itself, if it is properly isolated, is charged positively, The current for each square centimetre of radiating surface was about $4{\cdot}10^{-13}$ electro-magnetic C.G.S. units.

For my part, I showed that in an electric field the radiation of radium undergoes a parabolic inflection in the contrary sense to the field, as would be the case with a flux of negatively charged particles. The comparison of the electrostatic and magnetic deviations allows of the determination, like that of Professor J. J. Thomson for the kathode rays, of the velocity of the particles. For the particular radiations defined by $H\rho = 1600$, the velocity has been found equal to $1{\cdot}6 \times 10^{10}$—about one-half of that of light. The ratio of the material masses carried off to the charges which they transport has been found equal to 10^{-7}, a number identical with that corresponding to the kathode rays. From these numbers, and that which results from the experiments of M. and Mme. Curie, it follows that for each square centimetre of surface of the radiating substance studied there escapes a flux of material which would amount to a loss of about one milligramme in one thousand million years. If the material emission, which appears to be of the same order as the evaporation of certain scented substances, is the first cause of the observed phenomena, there would be no contradiction between the apparent absence of any source of energy and the continuous emission of this energy.

The most deviable portions of the radium radiation pass easily through all bodies when they are very near the source, but are stopped when these bodies are some centimetres distant. I have further recognised that, after having traversed a screen, the radiation possesses the same magnetic deviability.

I can only give here the physical properties of radio-activity. One of the most important applications has been the discovery, by M. and Mme. Curie, of new chemical elements. Radium has a high atomic weight, and a characteristic spectrum observed by M. Demarçay. Polonium, according to recent researches, has a spectrum in the ultra-violet. These bodies possess, then, the characters of simple substances.

Recent studies on induced radio-activity appear to open still new horizons. It has been mentioned already that a body becomes temporarily active when it receives the radiation of an active body. M. and Mme. Curie and M. Giesel have recognised that the induced activity thus provoked was much greater if the body was mixed in solution with an active salt, and then afterwards separated by precipitation. In thus rendering barium active with actinium, M. Debierne has recognised that the active barium behaves as a different body from ordinary barium, that it could be separated chemically and concentrated. Active barium thus resembles radium. It differs from it by the absence of a peculiar emission spectrum and by the fact that its activity weakens with time. I would add that recently Sir W. Crookes, who has made numerous experiments by the photographic method, announced that he had prepared uranium that was almost inactive. According to these experiments, as well as those of M. Debierne, M. Giesel, and myself, it would appear to follow that the activity of uranium is due in great part, if not altogether, to a small quantity of actinium or of another radio-active body.

These facts, although increasing the complexity of radio-activity from the chemical point of view, do not, however, remove from it its value; it can be remarked that if the existence of uranium as a simple body had been unknown up to the present, its radiant properties would have permitted of its isolation, even though they are not inseparable from its existence. HENRI BECQUEREL.

THE SLEEPY SEXTON.—A HUMOROUS MECHANICAL SLIDE.

IT may be that the nature of the sermon is, to some extent, responsible for drowsiness in a place of worship. Be this as it may, sleeping in church (which, by the way, is not confined to the sexton) is a practice that may well be depicted upon the lantern screen. The subject is one eminently suited for public exhibition. To watch the sinking head as it drops farther and yet farther at each successive nod, finishing with a jerk that shakes its owner back to half-consciousness, cannot fail to prove a source of great amusement, and act as a gentle rebuke to those who indulge in the habit.

In the present slide the scene is further comicised by the appearance of a friendly hand holding an umbrella, which is used freely in the act of awaking the sleeper.

We shall describe the fitting up of a complete slide, and then show how this amusing performance is to be gone through by the aid of the mechanism. The framework is, of course, made of some kind of hard wood, such as mahogany or oak, and the square opening is of the usual dimensions, i.e., $3\frac{1}{8}$ in. × $3\frac{1}{8}$ in.

The base of the model, G, is cut out of thin wood, and forms the foundation for the other parts. The body of the figure, H, is made of thin metal, as are also the parts A, Y, X, and L. The appearance of closing the eye, as the man lowers his head, is produced, first by cutting an eye-shaped opening in H, at the position indicated, and by the movement of the part L, which part is pivoted to H, at M, and moves with the latter. The plate, L, is furnished with a spring, K, which serves to pull it forward at the desired moment as the body of the man leans forward. There is a screw, J, fixed to the base, so that the body is prevented from leaning too far back; the same screw also regulates the movement of the plate, L. The body, H, is attached to the base by, and turns on, the fixed screw, I, the lower end of the body being attached to the plate, X, which in turn is connected at R to the actuating rod, S. A spring, P, connected at R, and fixed to the woodwork at W, completes this portion of the mechanism.

As will be seen by the diagrams, the movement of the rod is limited to the space between two saw-toothed plates, T T. At A, near to the top of the framework, there is a plate cut to the shape of a man's hand holding an umbrella; this is attached to the framework by, and turns on, the screw B; is furnished with a spring connected at C, and fixed at D. By means of the rod, E, the arm-plate communicates with the plate Y, the latter being attached to the framework by a screw at F. The slide is then complete and ready for exhibition. It is placed in the lantern with the rod, S, in the position shown in the diagram (fig. 1), i.e., with the figure of the man sitting upright and apparently wide awake, as indicated by the eye being open. The rod is then pushed down, when the projection on the side of the rod will escape the notch No. 1, and will pass to notch No. 2. This movement of the rod will allow the head of the figure to fall into the position indicated by the dotted line at 2, and at the same time the slit in the plate, L, will partly eclipse the opening made in the body, and which forms the eye, thus producing the effect of the lid dropping in sleep. The rod, S, is then moved in the opposite direction, with the result that it passes to the next notch, No. 3, bringing the head to the position of the dotted line at 3. This movement of the rod is repeated till it reaches the last notch (6), when the head will have fallen into the position shown in fig. 2. Here the eye opening, indicated by the dotted line, will be

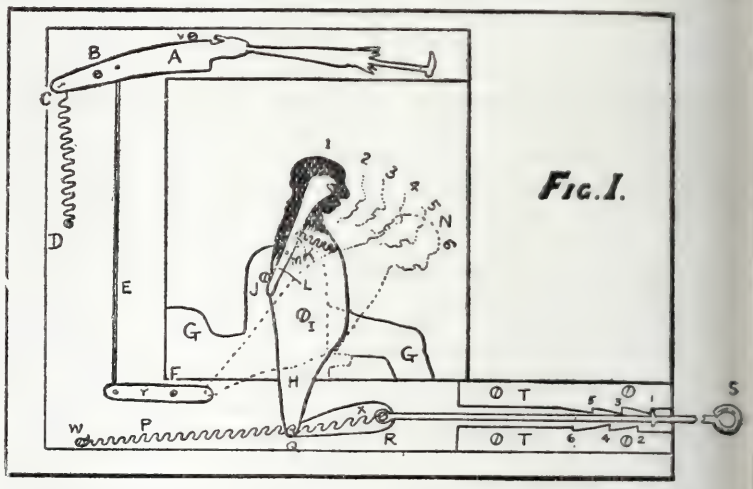


FIG. 1.

completely covered by the plate L, so that the man will appear to be sound asleep. The last movement of the rod will cause the end of the body to come into contact with the plate Y, lowering the opposite end, so that the rod, E, will be pulled down, bringing with it the hand that holds the umbrella, which proves the instrument of awakening to the drowsy sexton. As soon as the umbrella has done its

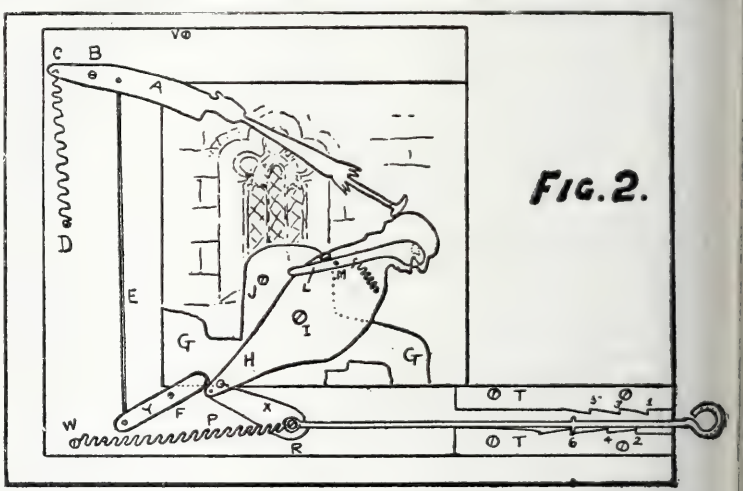


FIG. 2.

work the rod, S, is quickly pulled out again till the projection reaches either notch 3 or 4, then, after a moment's delay, it is drawn full out, when the sexton rights himself and opens his eye once more. It is obvious that if the best possible results are to be obtained upon the screen the operator must exercise some care in the manipulation of the model. It is within his power, by means of the rod S, to control more or less successfully, the entire process of a nap, terminating with a rude, but none the less amusing, awakening. It will be noticed that the length of the teeth in the plates, T T, increases slightly from No. 1 to No. 6. The object of this is that the rod, S, may shift a greater distance at each successive move, and at the same time cause the figure likewise to increase the drop of its head more and more till it arrives at its lowest position. A little reflection will show that on no account should the rod, S, be drawn completely out at the climax, but, as already observed, should be stayed for a moment or two halfway, otherwise a most unnatural finish will be the result, for where is the man who, after wandering to dreamland, regains complete consciousness at one moment of time? Rather, the sleepy sexton will require, with his head at the position marked 3, or 4 (see dotted lines), to meditate for a moment or so, before he becomes fully aware of his position and the nature of his surroundings.

It should have been mentioned before that the wooden base marked G should be glued to the glass, the latter being suitably fitted into the framework. The parts G, H, and A being opaque, are, of course, seen as shadowgrams from the screen. The general effect of the scene is greatly improved if, upon the back glass, the interior of a church wall with a stained glass window is painted. The window should transmit the strongest light, whilst the wall surrounding it should be tinted with some semi-transparent medium sufficiently dense to tone down the light emanating from this point. Thus the darkness of the moving figure will be somewhat in keeping with the degree of light coming from its surroundings. THEODORE BROWN.

MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

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CHAPTERS FOR BEGINNERS IN PHOTO-MICROGRAPHY.

Photo-micrography without a Microscope.

Of the many branches of photography which are open to, and claim the attention of, the amateur, very few can rival photo-micrography as a most interesting and fascinating hobby. Moreover, it has one great advantage peculiarly its own—it is a branch of photography which can be practised all the year round. The devotee of photo-micrography can laugh at our variable climate; it has no terrors or drawbacks for him. Does the sun shine out with tropical radiance, making landscape photography an impossibility, our enthusiastic photo-micrographist, clad in lightest garments, seeks out the coolest room in the house, and sets calmly to work at his ease. Likewise when winter sets in, and the days are dark and dreary, and there is altogether too much "atmosphere" out of doors for even the most "naturalistic" of photographers, we shall find our friend as merry as the cricket on the hearth, for his trusty microscope lamp is a faithful and ever-obliging sun to him, which always shines with the right amount of actinic power, and never goes behind a cloud at the most critical moment.

The apparatus required for working at this most alluring hobby is well within the reach of most people; that is to say, it may be as simple and inexpensive, or as elaborate and costly, as the taste and purse of the worker permit. The initial outlay need not be great, and from time to time, as the beginner finds he has mastered one section of the art, he can purchase the apparatus necessary for the next step. Above all, if the would-be photo-micrographer wishes to excel in his particular branch of the art, and to taste the sweets of success, let him begin at the very beginning, at the bottom of the ladder, and steadily but surely work his way to the top. To attempt the difficulties and technicalities of high-power work as an introduction to photo-micrography is to court disaster and utter disappointment; whereas by starting at the beginning, the tyro's first attempts will be crowned with sufficient success to encourage and lead him on to an ever-increasing interest in his hobby.

So, having determined to take up this fascinating branch of photography, let us begin operations with Low-power Photo-micrography or photo-micrography without a microscope. This sounds a little startling at first, but when we consider that in low-power photo-micrography the magnification ranges from one to ten or twelve diameters, and that therefore the objects to be photographed will be of a comparatively large size, the reason for dispensing with the aid of a microscope becomes obvious. For instance, no microscope tube is of sufficient calibre to give a large-enough field of view to photograph a small butterfly like the Chalk-hill Blue, or the entire wing of a Red Admiral. But if we substitute the bellows of a camera for the tube of the microscope, we at once get over the difficulty.

For this low-power work it is most important that the camera should have a considerable extension of bellows. To begin with, at any rate, a quarter-plate camera is preferable to a half-plate, on both economical and practical grounds; for, in the first place, the expense incurred will be only half as great, which is a consideration with most people, and a quarter-plate negative is much more easily manipulated during development than a half-plate one. Moreover, a good quarter-plate negative will always bear considerable enlargement. An ordinary quarter-plate stand camera will do admirably for photo-micrography, provided it has, when racked out to its greatest length, a bellows extension of twelve or fourteen inches at least.

A stand similar to that shown in the diagram (fig. 1) must be made to carry the camera and object to be photographed. For this purpose a well-seasoned pine or deal board, four feet long, nine or ten inches broad, and three-quarters of to one inch thick, which has been planed true on both sides, must be procured from the timber merchant. With great care draw an accurately central and straight line down the entire length of the board, A (fig. 1). It is most important that this line should be absolutely central and straight, as it will greatly facilitate and simplify matters later on. At one end of this board a stage, B (fig. 1), must be built, to which the camera can be firmly fastened by means of a tripod screw. The camera stage, which must be absolutely true and level, should be screwed on to two solid blocks, about four inches high, one and a half inches broad, and seven inches long, fastened to the baseboard with screws. From the base of the supporting blocks two V-shaped rails should run the whole length of the board, C (fig. 1), and upon these the object-holder will travel. A carpenter will make these for a small sum.

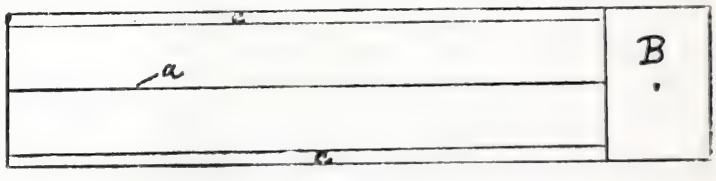


Fig. 1.

Take a piece of one-inch board, ten inches long and four broad, A (fig. 2), and to the under side fasten two pieces of wood with grooves corresponding in angle to the rails on the baseboard, B (fig. 2). Next make a good frame of half-inch wood, C (fig. 2), say 10×15 inches, and two inches deep. Screw two fillets of one-inch wood on to the top of the board carrying the grooved supports, D (fig. 2), leaving a space of two inches for the frame to slide into. By this means a cross movement can be obtained, which will be very useful for comparatively large objects. Narrow fillets of wood screwed on the in-

side of the frame will produce a rising and falling adjustment, E (fig. 2), with the aid of a thumb-screw at F, which will fix the carrier in any position we may require. A set of carriers should be made, fitting one within the other, G H (fig. 2), the largest just fitting into the

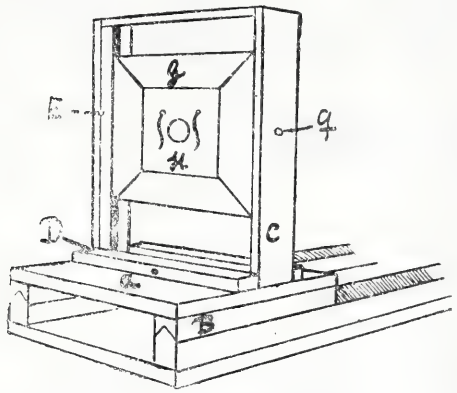


Fig. 2.

frame, and the smallest, which must have its centre exactly true with the centre of the camera lens, should have a round central hole about one inch and a half in diameter. A duplicate inner board without a central hole will be useful.

A little below, and to the right and left of the central hole in the smallest carrier, two clips, similar to those used on the microscope stage for holding the glass slide on which the object is mounted, must be inserted. They can be made out of two stout pieces of steel spring, mounted on a brass or steel pin.

Our stand is now complete, and our next consideration is what lens or lenses we shall require for our work. Now, if we are going to photograph a comparatively large object, such as a spider or a Tortoise-shell butterfly, subjects which only require a magnification of two, three, or four diameters, the best lens we can use is some form of what is technically termed a short-focus lens—a portrait lens of about three inches focus is very useful for such work. A very excellent small rectilinear lens of about $1\frac{3}{4}$ inches focus, with which beautiful results up to a magnification of seven or eight diameters may be obtained, is made by Messrs. Dallmeyer specially for low-power photo-micrographic work.

The ordinary microscope objective is out of the question where the magnification required does not exceed ten diameters, for, be it remembered, these objectives are only intended to be used with the microscope, and are therefore only corrected for a small field of view. Consequently, should we fasten a microscopical objective to our camera with a view to taking a photograph of, say, a small beetle, magnified nine or ten diameters, we shall find that only the exact centre of the field is clearly defined, while the portions surrounding the centre, and extending to the edges of the picture, will be fuzzy, and the legs of the insect all out of focus.

When, however, the object we wish to photograph requires a higher magnification, and therefore a more circumscribed field of view, a good three or two inch microscopic objective will be most useful. These lenses are by no means expensive, and a good one can often be picked up second-hand at a very reasonable price. With these objectives it is possible to obtain beautiful photo-micrographs of very small insects, such as the male gnat, with its beautifully formed antennæ; tiny blossoms, portions of flowers, leaves, stems, and other interesting objects of plant life.

Illumination is the next consideration, and in this much depends upon the class of object to be photographed, and whether reflected or transmitted light is to be used. It will be as well here to briefly state the microscopical meaning of reflected and transmitted light:—An object is said to be viewed by transmitted light, when the light is made to pass from the source of illumination directly through the object, thus bringing the internal structure into view. For this purpose the object must be transparent or semi-transparent. An object is viewed by reflected light, when the light is allowed to fall upon it, and not pass through it: by reflected light, only the peculiarities of the surface of the object are seen.

Supposing we are going to photograph a Chalk-hill Blue butterfly by reflected light, with a magnification of two diameters, and using daylight as the source of illumination. The photo-micrographic stand is placed near a window with a north aspect. The duplicate inner carrier without the central hole is substituted for the one with the central opening, and the butterfly is pinned upon it in position. Care must be taken that the apparatus has been placed in such a position near the window as to ensure the object receiving an even illumination. It is advisable also that the background on which the butterfly is pinned should be grey or dead black. When everything is arranged, focus the object upon the ground-glass screen to make sure that it is in the proper position; then substitute a piece of plate glass, with a few scratches upon its surface, for the ground glass, and upon this plate-glass screen do the final focussing with the aid of a focussing glass. It is only by this means that a really critically sharp image can be obtained.

Supposing the object we wish to photograph is transparent, or mounted in Canada balsam upon a glass slip for microscopical examination, the camera-stand must be placed so that the object-holder end is close to the window, and in such a position that the light from the sky is unobstructed, and able to pass through the central hole in the inner carrier in such a manner as to give an evenly illuminated field. This in most cases will be facilitated by slightly tilting the camera-stand.

Now, all objects that lend themselves to illumination by transmitted light may with advantage be photographed by artificial light, i.e. either oil or incandescent gas; and as these objects form a practically inexhaustible supply, we shall find no difficulty in keeping ourselves busy and interested through the longest and dreariest of winters. The additional apparatus required is at once simple and inexpensive; all that is wanted being a condenser (preferably six inches in diameter), and either a good circular-wick paraffin lamp or an incandescent gas outfit, such as is supplied for use with the lantern. A box similar to that shown in fig. 3 must be constructed,

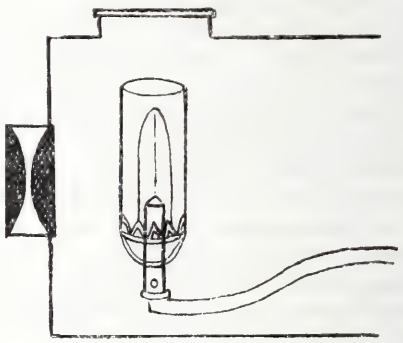


Fig. 3.

and for safety's sake, lined with thin sheets of tin. This box should be large and roomy, and well ventilated, so that it may not get too hot and so endanger the condenser cracking. Provided several air-holes are punched along the bottom of the sides of the box, and the chimney is a wide one, there should be little fear of this.

A sheet of fine ground glass placed between the light and condenser will be found not only to greatly improve the illumination by more evenly diffusing the light, but to cut off much of the heat that would otherwise fall directly upon the back lens of the condenser and prove a source of danger. Care must be taken that the position of the condenser is central with that of the lens attached to the camera, or it will be impossible to obtain a properly illuminated photograph.

It is almost impossible to give any hard-and-fast rule as to the length of exposure, as so much depends upon the power of the illuminant, the thickness of the object, and the speed of the plate used. A fairly transparent object, such as an ant, or small caterpillar, mounted in balsam, would probably be found to require from ten to fifteen seconds' exposure with a good incandescent mantle.

The plate must be backed, or halation will be inevitable, and some form of isochromatic plate should be used, so that as nearly true a rendering of the colour-value as possible may be obtained.

The author pins his faith to Edwards' isochromatic plates, which he has used for some years with great success. These plates are wonderfully free from "grain," which is of the greatest importance to the photo-micrographer; they are easy to work with most developers, and are sent out ready backed at the same price as the unbacked isochromatic plates. However, this is largely a matter of taste, and there are now several excellent brands of isochromatic plates on the market from which to make a selection.

In developing a photo-micrographic negative, the development must be carried very much farther than is usual with a landscape or architectural subject. Not until the picture is lost in blackness on the front, and fairly visible on the back of the negative, must the plate be taken out of the developer and transferred to the hypo dish, or it will be found to lack sufficient density. In fact, unless he is careful to bear this in mind, the tyro will find that he will have more failures from under- than over-development.

Where hard contrasts are wanted, hydroquinone may be used with advantage, but general work, and obtaining delicate detail and gradation, there is nothing to my mind to beat pyro.

Such are the methods and apparatus employed in low-power photo-micrography. A countless legion of suitable subjects await the pleasure of the would-be exponent of this most fascinating branch of photography; and there is no doubt that if he but work at his new hobby carefully and earnestly, it will soon lead him to aspire to try his hand at the greater difficulties and interests of medium and high-power photo-micrography.

F. MARTIN DUNCAN.

PICTURE FRAMES IN METAL.

AN excellent occupation for long evenings is the manufacture at home of frames for photographs, which may be deemed worthy of such enshrining. Of course, moulding of any description can be used for the purpose, but it is the object of this paper to show how artistic frames can be made out of old packing-cases, etc., in some instances, exclusively and in others, as taste may serve, as the foundation for metal ones. Stuff of about three-quarters or one inch thick is the most suitable, and if the original surface be marred with lettering, or be deemed too rough, in the case of wooden frames, the face, or what is to be the face, of the wood can be planed slightly smoother, and then split into lengths of the desired width. For most purposes, a breadth of two inches will be found most suitable, and when the strips are split up they should be placed a uniform width, and with sides absolutely parallel. This is an important point to be attended to, or the mitring will not be accurate. If the strips of wood are cut off in the mitre box before the rebate is cut, not only will the latter operation be easier, but a great deal of sawing will be saved, since when the first piece is mitred off, the second can be turned round, the rebate side becoming the back. This is obvious in cutting the lengths, but difficult to explain in words, though a sketch may illustrate how the rebate side is alternate in every length cut off the same strip of wood. A tenon saw can be used to cut the rebates if a rebating

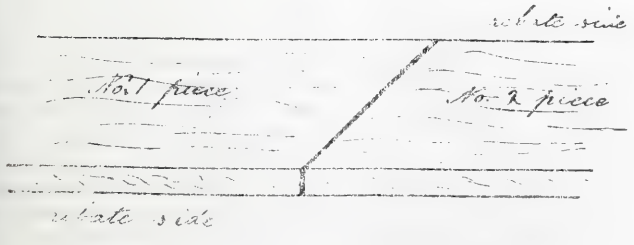


FIG. 1.

plane is not possessed, ¼-inch sufficing for the depth of the rebate from where the glass will rest to the face of the frame, and ½-inch being allowed for the width of the rebate in case of plain wooden frames, or ⅝-inch if the wood is to be covered with metal. For the completion of the former the mitred and rebated lengths have but to be joined up with glue (with or without nails), and the whole stained any desired shade by the application of some stain. By far the simplest way to secure any colour is to purchase a packet (3d.) of Diamond Dye (which can be had in all shades), and pour as much boiling water over the powder as may be required to make the depth of tint desired. Two or three applications of this may be required to obtain the right depth, and, if the colour be too bright, a little ordinary black writing ink can be mixed into the dye, which will subdue it admirably. A simple application of linseed oil, applied with a piece of flannel, and well rubbed in, finishes these frames, which will have cost next to nothing, as often old negative glasses can be fitted or cut down to them, and, if neatly made, will look as well as any, and much more artistic than many frames procured from an ordinary frame-maker's. Of course, gold slip can be used for these frames, and is often an improvement. It is not pretended that there is anything novel in this way of making these frames, or in the frames themselves, but the second pattern may perhaps not wrongfully be termed original. To make the initial framework, the same wood, rebated as before, is used, but in this case it need not be planed at all on its surface, nor yet mitred, unless desired, as most will find it easier to nail top and bottom at right angles with the sides. The frame, when put together, must be measured across, the depth of the sides being included in the measurement, and a piece of zinc of the thinnest gauge, ½-inch larger each way than the measurements taken, purchased. On this the wooden frame is centrally placed, and a pencil is run round both inside and outside, when the frame can be removed. Inside the inner lines, a rectangle, ½-inch smaller all round, is drawn (indicated by the dotted lines in fig. 2), and similarly shown are the diagonal lines from

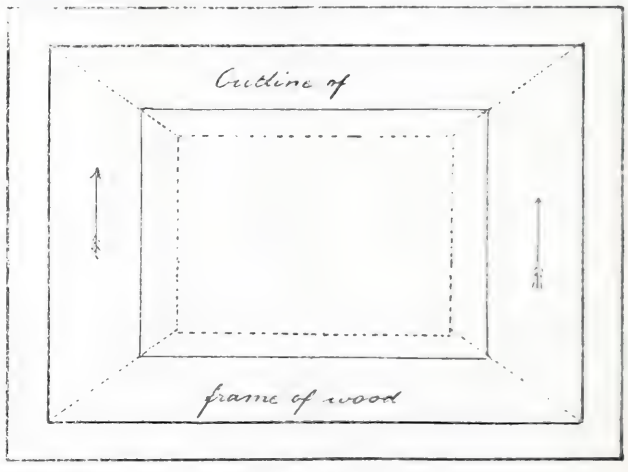


FIG. 2.

the corners of the outer pencilled rectangle, which lines pass through the corners of the inner rectangle. With a pair of tin shears, the innermost rectangle is entirely cut out, and the diagonal lines are cut down as far as the corners of the next rectangle. A pair of broad-nosed heavy pincers will easily bend up the ½-inch of square zinc inside the frame, and, fitting over this, the wooden frame is now placed, and the zinc bent over the inner edges. A hammer should go over the rebate next to bring the metal in as close a contact with the wood as possible. Then the outside edges are bent and hammered down in the same way to catch over the back of the frame, when it will

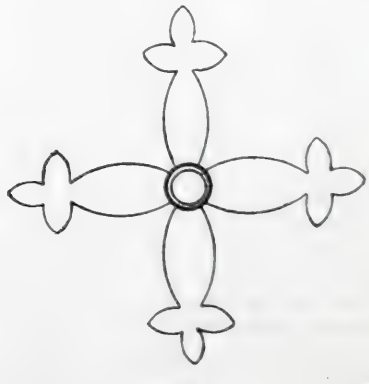


FIG. 3.

be seen exactly how much must be snipped off at each corner to allow of just a small margin to overlap the second cut edge, so that

the hammer can make a neat join of it, or a tin tack can be used at each side of the corners if too much has been cut off to permit of any overlapping. If a bad join is made, fancy nails can be knocked in at the angle, and an arm bent over on either side, the cross-piece hiding the ugly gaps. Fancy nails in the shape of a square cross, more or less elaborated, can be got anywhere, the pattern mattering little, so long as there are four arms, see fig. 3, which can be independently bent. They may be bronze, copper, or brass, but in either case should be rid of their protective lacquer before being used, or they will not be affected by the chemicals with which it is hereafter desired to affect them, if they be brass or bronze. Dipping them for a few seconds in any acid will quickly destroy the coating, and then they can be washed free of the acid used. The use of four of these nails is imperative on each frame to hide the wood necessarily left bare of metal at the four corners of the inside of the frame. The thinner the rebating, however, the less wood will be exposed at the corners. Fig. 4 shows where the nails are to be put, if any showing is required, one arm of each being bent over the rebate to hide the gaps, and imparting a finish to the whole frame. Subsequent treatment of the metal frame will, in initial proceedings, depend upon the results desired by individuals. As it now stands, it will be of a colour unsuited to anything except perhaps black and white prints; and, if for one of these the zinc is to remain in its natural state, bronze fancy nails, as harmonising more with the metal, should be used rather than brass. But probably most people will object to the crude colour (as it now is) for any sort of photograph, and certainly for brown and other warm-tinted pictures the colour of the metal must be changed. If this be done without cleaning or preparing the zinc in any way, frames can be turned out which look as though they had been dug out of Pompeii, and are very artistic. The zinc will probably be whitish in places, and this will conduce to the desired irregular chemical action, for which two solutions are required. The first is the ordinary stock solution of potassium chloro-platinite, as used for platinum toning, *i.e.*, the contents of a 15-grain tube dissolved in one ounce of water. Some of this is brushed all over the surface of the frame, followed by a similar application of the second, a very strong solution of copper sulphate. For these applications, two stiffish brushes should be used, and, as friction appears to assist the action, they should be vigorously plied. Crystals of the copper may, with advantage, be rubbed on and down the frame with the brush, and will give a heavy deposit of copper wherever they rest. The frame will first blacken, and then in parts, those free from grease and chemically clean, the red of copper will appear. The action must be allowed to continue until the frame has darkened all over, and, at this point rinsed under the tap, and, when clean, wiped dry, when the effect can be properly judged. If it is not satisfactory, the operations should be repeated, but if this be not necessary, the frame is finished off with a polish of linseed oil, and no one would guess that the resultant frame had been made from zinc and in the twentieth century. Readers may think this use of platinum very extravagant, but it is necessary to deposit the copper in its red hue, and 15 grains will go a very long way. If a copper solution only be used, the frame will soon blacken, but the copper deposit will be very powdery, and easily rub off. Copper-plating with an electric battery would probably be the more orthodox way to set about "copperising" these frames, but everybody has not a battery. However, if one can be procured, its manipulation is not difficult. Attach the wire from the negative pole (the zinc plate in the battery) to the frame, and the second wire to a copper plate placed in contact with the frame, and, this suspended in a solution of copper sulphate, will receive a fine deposit of copper in the metallic state. However, whichever method be used, if a uniform deposit of copper be desired, the frames should be cleaned with sulphuric acid before chemical depositing is begun. The frames finished, any title or simple ornamentation in harmony with the subject to be framed can be hammered on the metal by various sized blunt-pointed nails in default of proper metal punches, or else executed in small nails of any suitable kind. These frames are, if not absolutely unique (though this the writer believes them to be, and at least in manufacture), certainly somewhat out of the ordinary, and as such will perhaps be welcomed by some readers of The British Journal of Photography Semper Eadem.

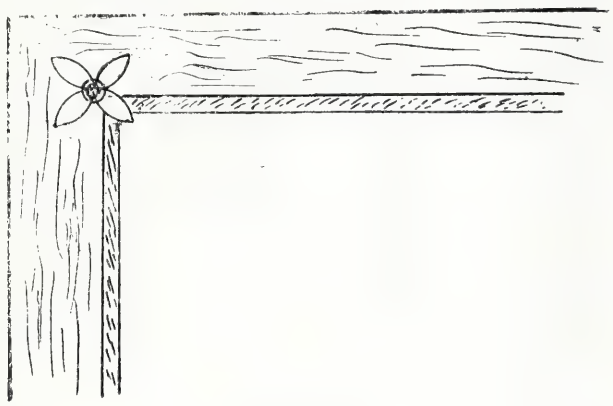


Fig. 4.

THE CAMERA IN THE ALPS.

Recently before the members of that progressive body, the Redhill Camera Club, the well-known mountaineer, Mr. H. Speyer, delivered a lecture at the North Room of the Market Hall, on a mountaineering expedition which he undertook some time ago in the Dauphine Alps. Mr. Speyer opened his lecture with a short description of the Dauphine system. The Dauphine Alps were not, he said, like most mountain systems. They were not a long range, nor did they lie in horse-shoe formation, as did many of the Alpine ranges. They were huddled together in a circle of about twenty miles in diameter. The geographical position of the Dauphine Alps was in the south-east corner of France, principally in the department of Hautes Alpes, within 100 miles of the Mediterranean. Mr. Speyer said that the highest peaks of the Dauphines ranged high among the mountains of Europe. There were three points above 13,000 feet, more than a few above 12,000, and about sixty between eleven and twelve thousand feet above the sea level. The Dauphine Alps had been but slightly explored. The accommodation at inns was very meagre, and they were dirty and expensive in the extreme. He was charged the sum of £40 for only a short stay at one of the inns, and the only meat which they had during their stay was "cow," which his guides had to slaughter for their host. Mr. Speyer, during his stay in the district, scaled the two highest points, Les Ecrins, 13,462 feet above the sea, and La Meige, 13,081, while many of the less important peaks, only a few hundred feet lower, succumbed to Mr. Speyer and his guides. The ascent of Les Ecrins and La Meige both presented terrible difficulties, the slope of the mountain often being as much as 70 degrees. Mr. Speyer showed several interesting slides obtained during the ascent of these heights, and often taken in places where the climber was compelled to "hold on by his eyebrows and the skin of the teeth," further aided by the moral support of a rope. When the summit was at length reached the long climb was amply compensated for, the views being magnificent. In one, 85 miles away amidst rolling billows of clouds, could be seen Mont Blanc, while others were one vast mass of rolling clouds through which the high towering peaks could be seen. Other important peaks which Mr. Speyer ascended were Les Rouies, Les Bans, and La Pic d'Olan, all over 11,000 feet. Very interesting was Mr. Speyer's description of his climbs on these other points, and the pictures that he showed of them were little short of marvellous. Mr. Speyer also visited the Glacier de la Pilatte, the principal glacier of the district, which is nearly five miles in length. It was, said the lecturer, a peculiarity of the district that being so far south—within 100 miles of the Mediterranean—the glaciers were so large; no other range in Europe so far south as the Dauphines possessed such immense glaciers, and in the old time they had been much larger still. Another peculiarity mentioned by the lecturer was that none of the mountains of the system had snow peaks. They were all rock; in every case the rock cropped through.

THE PANORAMIC AND STEREOSCOPIC CAMERA OBSCURA.

It is a well-known fact that the two images received upon the screen of a stereoscopic camera are in the reverse order to that in which they should be for examination in the stereoscope, and that unless the prints taken from a negative so obtained be transposed before mounting, the proper effect cannot be obtained in the stereoscope. It is probably this reverse order of the dissimilar images upon the screen of the stereoscopic camera that has deterred inventors from con-

structing a stereoscopic camera obscura. By the use of one of Fallowfield's stereo-photoduplicons in the place of a pair of lenses, the difficulty just mentioned is entirely overcome. By placing one of these instruments on a single lens it will be found that the images received upon the screen of the camera are already transposed. The accompanying diagram (fig. 2) will make this clear. The ordinary camera is supposed to be situated at D, the lens at C, and the object to be photographed at E E. The stereo-photoduplicon consisting of a shutter, to which is attached a stage fitted with four mirrors, is placed upon the single lens just in the same manner as an ordinary cap or shutter. In the diagram the mirrors are shown at A A and B B. It will be seen that a view of the object, E E, is received upon the two separate mirrors, A A, the latter being placed at a distance apart equal to the separation of the human eyes. Thus, light emanating from the object is reflected from the two outside mirrors and received upon the two inner mirrors, B B, which in turn reflects the light to the lens, C, where it is transmitted and transversed to the plate. The mirrors employed in this apparatus are silvered on the front surface, so that the pictures taken by it do not suffer in definition; a fact that may be verified in the mind of the reader by referring to fig. 3, which is a view taken by means of the apparatus. Now, it is obvious that by using a stereo-photoduplicon in conjunction with an apparatus constructed after the manner shown in fig. 1, that a stereoscopic camera obscura is possible. Here the stereoscopic attachment is shown at D and E, and the lens at F. The inside of the camera is partitioned off at H. This partition, which is set at an angle of 45° to the sides of the camera, has an opening through which the light coming from the lens may pass when it is desired to take a photograph. At G, lying in contact with the partition, is a mirror, hinged to the upper part of the partition, and regulated by a lever, I. A screen is fixed at M, in the top of the camera. Above this, at A, there is a collapsible hood or shade fitted at the top with a pair of stereoscope lenses, and the usual shaped hood or shade for the eyes. By the usual dark-slide system, the sensitive plate is made to register at L, so that the distance the light has to travel, whether allowed to pass through the opening in the partition H to the plate, or whether it is intercepted by the mirror and reflected to the screen, is just the same. Thus the screen acts as a full-size view-finder, by which accurate focussing may be determined. Further, by means of the stereoscope attachment A, the two dissimilar images projected upon the screen M, are presented to the mind of the observer superimposed, so that a binocular image of the landscape is seen. By turning the camera on the tripod head in the usual manner, a continuous or panoramic picture is seen in stereoscopic relief. Apart from the fact that the operator is thereby enabled to determine with absolute certainty the aspect from which a landscape, if photographed, would present the best possible effect as a binocular picture for the stereoscope, the apparatus, merely as a camera obscura, is extremely entertaining. Here we have an exhibition of living pictures, not merely in stereoscopic relief, but also rendered in natural colours. The experienced stereoscopist knows very well that, according to the distance of any object from the camera, he will have to vary the separation of the two lenses in order that the two images of such object may have a proper separation upon the exposed plate. The nearer the object to be photographed, the closer together the lenses will have to be, and the farther away the object may be the greater the separation of the lenses. In the present apparatus such a separation of the two images is regulated in quite a different manner. One of the outer mirrors of the stereo-photoduplicon is hinged to the staging, and is fitted at the back with a screw arrangement, by which the mirror may be adjusted to any desired angle. Thus, whatever the distance of the object may be, the two images of the same may be easily adjusted as regards their separation.

THEODORE BROWN.

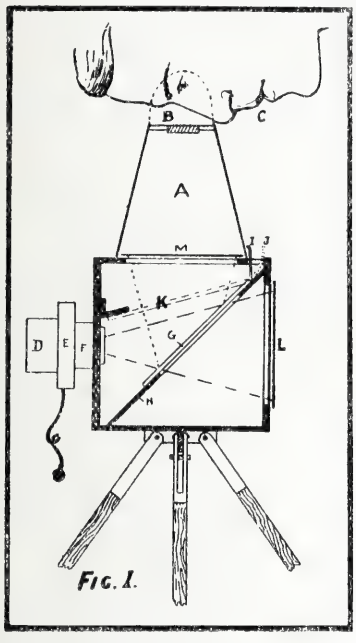


FIG. 1.

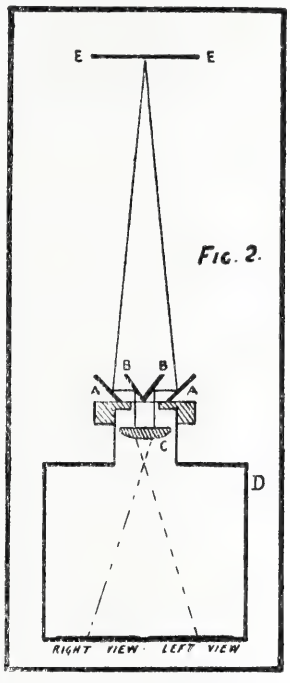


FIG. 2.


FIG. 3.

THOUGHTS CONCERNING THE NATURE OF THE LATENT IMAGE.

[Translated from the "Photographische Mitteilungen."]

THE fundamental question in the theory of photography, as to the nature of the latent image, remained in a dormant condition for a great number of years. The sub-haloid theory was generally considered sufficiently in agreement with other theoretical aspects of the subject and with the teachings of experience. But the resuscitation of the nascent silver theory in 1899 induced various investigators to make fresh experiments, and these resulted in Eder's refutation of the arguments of the nascent silver theorists and the rehabilitation of the sub-bromide theory.

It is not my purpose to reinvestigate the nascent silver theory, nor to attack the sub-bromide theory, but the various experiments I have made show so clearly how little many of the old arguments prove for or against both hypotheses, that I think it may be valuable to make my results known. The details of my work relating to this question will shortly be published in the "Photographische Correspondenz," and I shall therefore refrain from more than an indication of the series of experiments I have undertaken.

In the first place I endeavoured to repeat, in rather more exact form, one of the principal experiments of the advocates of the nascent silver theory, by preparing metallic silver in the finest conceivable state, by reduction from an emulsion as used for Lippmann's colour process, and investigating its action when mixed with a silver bromide emulsion and subjected to development. This disclosed the surprising fact that silver in this finely divided state does not set up any reduction in gelatine emulsions, whilst in collodion emulsions a complete blackening of the silver bromide follows.

In the case of gelatine emulsions, the difficulty presented itself, that experiments for the conversion of the grainless silver to sub-bromide by bromising could not be quantitively controlled. The bromine exhibited as much affinity for gelatine as for silver, and only a partial conversion to sub-bromide could be effected. With gelatine emulsions, however, no fog was produced by action upon the silver bromide. On the other hand, in the case of the collodion emulsions, it was impossible to arrive at any conclusion from the experiment of bromising, because the simultaneous presence of metal, according to the first experiment, must necessarily be followed by reduction.

The treatment of the latent image with bromine was likewise unproductive of any results of a reliable nature in the case of gelatine emulsions. It was found that even a very dilute aqueous solution of bromine rendered the gelatine quite insoluble after short immersion. The application of bromine before exposure would consequently hinder the formation of an image. It was impossible to alter this, even by most carefully washing the plates after the bromine had been applied. The bromine combines so tenaciously with the gelatine that it cannot be detected with silver until the film has been destroyed with strongest nitric acid. In the case of collodion emulsions, it was clearly shown that a solution of bromine had far greater effect upon the sensitive film after exposure (i.e., upon the latent image) than before (i.e., upon the silver bromide). It may therefore be said, with some truth, that in this case bromine has some action upon the latent image. At the same time, bromine, in appreciable strength (one per cent. in water), acts so strongly upon collodion emulsions prior to exposure that the formation of an image is quite precluded. Bromising fails as a conclusive experiment by which to decide between the sub-bromide and the nascent silver theories, as the metallic silver forming the negative image is also very easily converted to bromide of silver by immersion in an aqueous solution of bromine.

One of the chief arguments against the nascent silver theory was that nitric acid did not destroy the latent image. Many champions espoused this argument of the indestructibility of the latent image by means of nitric acid. But it is easily shown that the nitric acid used by the experimentalists in question was not, in all cases, sufficiently strong to dissolve the silver forming the negative, and, that by using nitric acid of the highest strength, the latent image could be destroyed upon a collodion plate. Experiments with gelatine plates are futile, because the gelatine film is destroyed by dilute nitric acid of quite insufficient strength to dissolve silver. In my opinion, Eder's experiments with sensitised bromised collodion plates are not suitable for clearing up the question because of the excess of silver. A particular instance was examined, the result of which could not prove anything concerning the latent image in its strict meaning. In the case of emulsions without any excess of silver, there is no doubt that the image may be destroyed by nitric acid. However, I still fail to see why the reaction with nitric acid should play such an important part in the controversy as to the two hypotheses. It was assumed that sub-bromide and nitric acid reacted according to the formula,

$$4Ag_2Br + 6HNO_3 = 4AgBr + 4AgNO_3 + N_2O_3 + 3H_2O.^1$$

The pure sub-bromide of silver prepared by Otto Vogel[2] by means of sub-bromide of copper also conformed to this formula.

Taking the results of my investigations so far, can it be said that they favour either of the theories in question? I think not. Although the grainless silver, introduced into the collodion emulsion, suffered reduction by development, metallic silver may not be formed by exposure to light, and, whilst I am quite willing to admit that I have rescued one of the experiments which the opponents of the nascent silver theory had refuted, I wish to make it understood that, in so doing, I have not helped the nascent silver theory.

The possibility of physical development, after fixing, has been adduced as an important argument in favour of the nascent silver theory, but I do not think this is quite correct. Since the earliest days of photography we have had proofs that vapours, or solid bodies in the nascent state, deposit themselves upon the exposed surfaces of solid bodies, without presupposing any chemical change during exposure, so far as our scientific knowledge can show. In 1842, Moser enunciated a theory of the Daguerreotype process. He explained it, not as a chemical process, but as a condensation of vapour of mercury, similar to the formation of ghost images. He found that by using aqueous vapour also, an image was formed upon a Daguerreotype plate. General Waterhouse's interesting experiment, which again excited astonishment at the Paris Exhibition, also belongs to this class. Waterhouse obtained an image by exposing a plate of pure silver, and developing it in the mercury box. It is quite contrary to our views to believe that a chemical change in the metal can have been caused by light. If we can neither accept the nascent silver nor the sub-haloid theory, we must ask ourselves the question, in the study of the nature of the latent image, whether we have reason to suppose that any kind of reduction of silver bromide, or that any chemical change whatever takes place, through the action of light?

Doubtless, there are various reasons for admitting chemical change. When a gelatino-bromide plate has been exposed for some time, bromine is liberated. This can be detected by the smell, after a plate has been exposed to bright light for a few hours. But this would not be of much weight in considering very brief exposures. It must, likewise, be conceded that the phenomena of solarisation are rendered in some degree intelligible, by supposing that a substance is formed by exposure to light, which stands somewhere between metal and bromide, as Eder has pointed out. But the indistinct conception we have of the processes of solarisation deprive this argument of much weight. It must also be acknowledged that the theory of chemical sensitisers pre-supposes absorption of bromine, and its consequent liberation at the moment of exposure, but the theory of sensitisers may also be incorrect. If we remember that the chief chemical sensitiser is nitrate of silver, we must freely admit that absorption of bromine by nitrate of silver is plausible. But we must not forget that we have, on the other hand, totally different rapidities with collodion emulsion, if we form the silver bromide in presence of an excess of silver nitrate, or bromide salt, and afterwards remove every trace of superfluous soluble salt. The physical modifications of silver bromine differ so enormously that by far the most important problem in photography appears to me to be "What have we upon the plate, before exposure, in the various cases of the different forms of silver bromide?" not "What is formed by exposure to light?" My experiments with the incorporation of molecular silver in emulsions also showed how different analogous cases turn out in photography, from a chemical point of view.

How is it possible to explain the enormous difference in the sensitiveness of silver bromide if we assume a simple chemical process in the formation of the latent image? In discussing chemical sensitisers Eder writes:—"The cause of the high sensitiveness of gelatine emulsions appears, however, to be mainly ascribable to the formation of a specially definite modification of silver bromide." What does the theory of chemical sensitisers still mean in this case? There is not the least doubt that gelatine absorbs bromine, but there is no proof that bromine is liberated in the process of exposure. If we consider that the difference in the sensitiveness of an emulsion for the Lippmann colour process, in comparison with a modern instantaneous plate, is as 1 to 20,000, what weight can we still attach to our idea of the liberation of bromine, when the absorbing substance, gelatine, is the same in both cases?

[1] Eder's "Handbuch der Photographie," part 2, section 6, p. 53.
[2] "Photographische Mittheilungen," 1899, p. 334.

According to my opinion, the formation of the latent image is not a simple process. Several processes seem to take place concurrently, and the "substance" of the latent image may differ in the various photographic processes.

We cannot definitely affirm that the process is chemical, neither are we entitled to conclude that the change in the silver bromide is purely physical, as the properties of the medium appear to have a species of chemical influence.

I think I have shown that not much can be attempted with the hypotheses that have been formulated. Perhaps further experimental investigation may soon lead to conclusions which will guide us to a true theory of the latent image formed by light.

Dr. Luppo-Cramer.

ELECTRICAL ACTINOMETERS.

When two copper plates, combined in a voltaic cell, are exposed unequally to light, an electric current is produced. Such a cell may be constructed of two plates of sheet copper, four inches in length by two inches in width, separated by half an inch, and suspended in a glass vessel containing water, each plate being insulated and joined by a foot of copper wire to the terminals of a sensitive galvanometer. A Thomson reflecting galvanometer is a convenient instrument to employ. On making the connexions, so completing the circuit, a deflection of the galvanometer mirror will at once occur, arising from a difference of potential between the various parts of the circuit. If now one of the plates is protected, whilst the other is exposed to a source of light, the mirror will be again slightly turned. By causing intermittent light to fall on the plate, a swing will be generated in the mirror, the spot of light reflected moving through several degrees of an arc. Assuming the copper to be clean and polished, and the source of light a candle at four inches distant from the plate, the E.M.F. (electric motive force) under these conditions will be very small. For purposes of comparison with what follows, it will be given the relative numerical value of .0002.

On removing the copper plates, and either oxidising or iodising them, and exposing under the same conditions, the E.M.F. of the cell will increase, and the value obtainable will rise to .0014. Oxidised copper plates have, up to the present, been found to yield the greatest E.M.F. The copper plates for these cells may be oxidised by heating to redness, and allowing to cool slowly, or by treating with nitric acid, and then heating until they blacken.

From this distinction between polished and blackened copper it follows that the plates act as absorbing media, since a dark body like copper oxide reflects less of the energy radiated from the candle than the surface of polished copper. It might thus be concluded that the currents obtained are simply thermo-electric, created from the heat rays of the illuminant, which are absorbed by the exposed plate. Water and glass, however, cut off the greater proportion of radiant heat, and an even better screen is potash alum. Removing the water, and filling the vessel with a saturated solution of alum, 90 per cent. of the heat rays will be stopped. With this cell the first effect noticeable will be an increase of the initial E.M.F. Allowing the needle to become stationary, and, again exposing one plate to light, there will be no marked falling off of the current. Actual experiment through an inch of alum solution gave the following:—

1 c. p. at 4 inches	.0014
2 ,, ,,	.0029
3 ,, ,,	.0043

A different cell, containing water, gave as under:—

2 c. p. at 4 inches	.0043
4 ,, ,,	.0087
4 ,, 12 ,,	.0011

Here there is no destruction of the current, though with water the E.M.F. obtained is greater; this, however, may be owing to the cell. It is also noticeable that in both cases the current increases proportionately with the power of the illuminant, and that, in the latter, the law of squares is clearly indicated. On employing magnesium wire as a source of light, making a comparative test between water and alum, using the same cell throughout, the values were as under:—

Magnesium through water	.0175.
Magnesium through alum	.0175.
1 candle power through alum	.0014.
1 candle power through water	.0014.

From this it is seen that the E.M.F. is identical with both solutions by candle or magnesium light, tending to prove that radiant heat is not the active agent in producing the effects. Magnesium gives an increase of current, the ratio with a candle being as 1:12.5. With these illuminants the percentage of energy is transformed thus: Candles 98 heat, 2 light; magnesium 85 heat, 15 light. With equal energy magnesium is 13 p. c. colder, and 7½ times more luminous than candle light, this, again, leading to the conclusion that the greater luminosity of magnesium is the direct cause of the increased E.M.F., rather than the radiant heat transmitted through glass, and a saturated solution of alum.

With both sources of light, the action upon the galvanometer needle is immediate; directly the light reaches the plate the current flows, being maintained alternately; that is, there appears to be a back current. The sensitiveness of these cells can be gathered from the fact that an exposure of one second to a candle at a foot distant will yield a distinct movement of the mirror. With a gelatine plate of ordinary rapidity one second's exposure at fifteen feet from the same candle will give a clearly defined image on development. Compared with the cells used in these experiments, this shows, as regards sensitiveness to faint impressions, an advantage of 225:1 on the side of the photographic plate. The galvanometer is, however, capable of discriminating more accurately between luminosities to which it is sensitive.

Assuming that these cells are truly photometers and actinometers, and not thermopiles, it becomes of importance to determine the effects of the different coloured rays. This can be done by filling the cells with coloured solutions. On testing in this manner the following readings were obtained:—

Chrome alum (candle)	.0014.
Chrome alum (magnesium)	.0175.
Aniline crimson (candle)	.0005.
Aniline crimson (magnesium)	.0043.
Aniline blue (candle)	.0002.
Aniline blue (magnesium)	.0040.
Aniline violet (candle)	.0002.
Aniline violet (magnesium)	.0043.

Here it is seen that with chrome alum, which transmits the red rays, there is no decrease in the E.M.F. compared with plain water or a saturated solution of alum. In itself, the chrome alum solution was of a deeper colour than the remainder. The crimson, blue, and violet dyes all reduced the E.M.F. to a marked degree. When red fabric is placed between the light and the cell, but a slight diminution of the E.M.F. occurs. In contrast with this, on colouring a solution of potash alum a pale blue, the current due from magnesium fell from .0174 to .0087. In every instance a blue or violet dye has lowered the E.M.F., though none has destroyed the action, whilst red solutions reduce the action to a smaller amount. This points to the conclusion that the red rays are the most active in creating the current.

It is stated that the E.M.F. of these electrical actinometers can be augmented by using dyes in the cells which act as sensitisers in a similar manner as they act on the photographic film. The experiments below, undertaken in daylight, illustrate this point. Using water in the cell for the first trials, followed by dyes:—

Daylight Feb. 1 (11 to 1) (water)	.0087.
,, ,, ,, ,, ,,	.0130.
,, ,, ,, ,, ,,	.0174.
,, ,, ,, ,, naphthol yellow	.0087.
,, ,, ,, ,, naphthol yellow	.0130.
,, ,, ,, ,, malachite green	.0087.
,, ,, ,, ,, malachite green.	.0043.
,, ,, ,, ,, erythrosine	.0087.
,, ,, ,, ,, erythrosine	.0043.

The highest reading secured is with plain water, the dyes giving under this figure, although at times the light was brighter whilst they were tested. The analogy between a gelatine plate and the cells, in regard to the sensitising action of dyes, thus breaks down, nor could the result be unexpected if the subject is closely examined. The copper oxide used in the cell approaches in absorptive power a surface of lampblack. The radiant energy from the illuminant is therefore almost totally absorbed, and cannot be affected by solutions the absorptive properties of which are below that of copper oxide. Gelatine plates being more reflective, it is evident that any dye which deepens their colour inasmuch adds to their absorptive capacity. To increase the E.M.F. of a copper oxide plate, a substance must be in contact with it capable of absorbing those rays the oxide alone reflects. It is thus quite possible that the E.M.F. may be higher by this amount.

In opposition to the foregoing, one experiment with naphthol yellow may be cited:—

3 c. p. at 4 inches	.0063.
Magnesium ,,	.0174.

This c. p. E.M.F. is higher than when using plain water. Naphthol yellow, if a sensitiser, would probably absorb reddish-yellow, and it is these rays in which candles are especially rich. Even supposing these electric actinometers give no higher E.M.F. under the action of dyes, they still remain as very sensitive analysers, as by placing various coloured solutions in the cells the effective energy of transmission can be accurately measured, their superiority over the actinometer depending on the darkening or decomposition of chemical substances, consisting in this, that they can be applied differently, as well as to discriminate between the chemical energies of coloured rays.

Tabulated below are the results of some experiments made to determine the absorptive properties of erythrosine, eosine, and malachite green in comparison with water. The two former solutions contained 30 grains of dye to 20 ounces of water, the green three grains to 20 ounces. In each instance the light traversed three-quarters of an inch of the liquid:—

	Water.	Eosine (yellow)	Erythrosine.	Malachite green.
1 c.p.	·0011	·0011	·0017	·0009
2 ,,	·0023	·0023	·0034	·0020
3 ,,	·0034	·0034	·0052	·0030
4 ,,	·0046	·0046	·0069	·0040
5 ,,	·0058	·0069	·0087	·0050
6 ,,	·0069	·0093	·0104	·0061
Mg.	·0349	·0175	·0262	·0130

With candle power erythrosine undoubtedly exercises a sensitising action. Eosine is doubtful, as only in the higher readings is the E.M.F. greater; it must, however, increase the absorption of copper oxide, since a solution of the strength used, acting as a screen, a proportion of energy is cut off; yet, allowing for this loss, the E.M.F. is still equal to the water cell. With malachite green there is a reduction of current. Magnesium wire acts differently, for water shows the highest reading, followed by erythrosine, eosine, and malachite green.

In this set of experiments the action of magnesium was more carefully measured, and its E.M.F., after repeated trials with a water cell, reached .0349, at six inches' distance from the plate. On testing the candle power at one foot the reading was .0002. This gives the relative energies of the two illuminants as 1:43.5 Photometrically, magnesium wire is taken as 74 times more luminous than one candle power at one foot, the relative photographic values being as 1:1110. Evidently, these cells measure that which is not strictly photometric, nor photographic, nor thermic, though all are included in the results. hence by the use of selective screens each may be definitely expressed in the one electrical unit.

JOHN A. RANDALL.

THE DISTINCTIVE USES OF THE HAND AND THE STAND CAMERA.

[A Paper read before the Edinburgh Photographic Society.]

The Hand Camera.

Its Construction.—The hand camera I shall describe is one of the best made, and by explaining its parts I hope to put before you information which may be of some use. The hand camera I use is the Newman and Guardia Special B, 5×4 size, and to more easily explain its construction I have brought it with me to aid me in describing its working parts. The woodwork is of seasoned mahogany and is covered with black morocco leather, is in the form of a box into which some fittings same as those of an ordinary camera are adjusted. The front of the camera comes off, leaving the back portion of the camera with bellows, focussing screen, and changing bag. This is of convenience for cleaning purposes. The front portion of the camera contains an automatic spring door which acts as a dust-protector to the lens; there is a pneumatic regulation shutter fitted between the lenses capable of giving exposures from half a second to a hundredth part of a second. The lens is a Zeiss Satz, series 7, the focus of each of the combinations being nine inches, and the focus of the combined lens five inches. The latter combination works at a full aperture of *f*-6.5, and the single combination at a full aperture of *f*-12.5. This places in the hands of the worker a doublet lens short focus, and a single or landscape lens of long focus. The view-finders give the correct reduced view, the camera racks from the central rack and pinion and has double extension. The settings of the shutter and the iris diaphragms are worked from the base of the front, rising and cross fronts are also fitted to the camera, the rise in each case being equal to one-fourth of the view shown in the view-finder, and this, of course, must be allowed for. It is worth bearing in mind that the lens is the part of the camera of primary importance, the other parts being auxiliaries. There is no question about the ease and facility with which a hand camera may be used, and in a good many cases records may be obtained which it would be impossible to secure with a stand camera.

Class of Subjects.—These are numerous. The following may be mentioned:—Athletic sports, military manœuvres, street incidents, animal studies, children on the sands, yachting, landscape and seascape photography. The classes I have mentioned are too well known to you to call for further remarks from me, and I will now show you on the screen some typical examples of hand camera work.

The Stand Camera.

Its Construction.—The square form of stand camera is, I consider, preferable to that with tapered bellows, as the corners are not cut off when a short focus lens is in use; rack and pinion should be of strong make. The camera should also be fitted with double extension, and where this is done, the tailboard bolted and hinged in the centre so that it may be folded down out of the way when necessary. The camera as well as the tripod should be of strong, solid make, as rigidity is of great importance. Avoid having a multiplicity of so-called ingenious devices, as they are of little use and often a hindrance rather than a help. Three kinds of lenses occur to me as being specially suitable for amateur work:—The wide angle lens for architectural subjects and use in confined places. The rectilinear or doublet lens, suitable for street scenes, animal subjects, flower studies, and certain landscape and marine photography. The single long focus or landscape lens is specially suited for woodland, landscape and seascape work, where it is of primary importance that mid-distance and distance are rendered in true relation to the rest of the subject. The camera should be fitted with levels on the top and sides. A good shutter to use is the Goerz Sector, fitted between the lens combinations. The flanges of the shutter open and shut from the centre; it is regulated for time and instantaneous exposure, with speeds ranging from a half-second to a hundred-and-fiftieth part of a second. I will be pleased to show this shutter, to any member anxious to examine it, after the meeting is over.

The stand camera is specially adapted for taking the following classes of subjects, and these are practically out of the range of hand camera work. Of foremost importance I place that of portraiture, and that in its highest sense, as shown by the beautiful work done by Messrs. Crooke, Craig Annan, Walter Barnett, Miss Alice Hughes, Baron von Meyer, and others. Architecture, more especially the interior architecture of our large cathedrals and mansion houses. Woodland scenery, particularly in the spring-time and autumn, is full of subtle attractions for the amateur. Flowers, fruit, and still-life form an interesting series of studies. British birds and their nests, as you have recently heard from Mr. Harold Raeburn, are keenly interesting to the lovers of ornithology. These instances alone, to my mind, go a long way to prove the utility of the stand camera. I do not for a moment consider that the hand camera is ineffective or of no use, but what I do think and emphasise is that the stand camera can do work which is out of the range of the hand camera, and, in many instances, can do work that the hand camera is specially suited for, equally well. One writer, who is known for his knowledge as well as his excellent work, recently referred to the hand camera in one of his articles as follows:—"The fatal facility of the hand camera," and there are few amongst us, I am sure, who have not felt this. Colonel Gale, in giving his lecture to the Royal Photographic Society in December last, remarked, "None of the views shown this evening are taken with the hand camera, or by the so-called instantaneous process, and yet it will be seen that figures, human or other, appear in most of the slides and play an important part in their composition."

I have left to the last the consideration of landscape and seascape photography. These, perhaps the most interesting to most of us, can be taken by both cameras; but in the hand camera the view is limited to the reduced image on the small view-finder. With the stand camera there is a considerable difference. After the view is selected, and the camera set up, you have the benefit of the full-sized focussing screen actually representing the view you wish to take, and because of this you have the power of altering and composing the picture until you get exactly what you are aiming at, and when doing this the extent of the luminosity and the effect colour has upon the scene must be borne in mind, for, alas, the photographer must reduce colour to monotone. I must say this in conclusion, that the person who takes up photography as a pastime, be the camera hand or stand, is brought into a closer touch with Nature, seeing her in many diverse and beautiful moods. The summer days spent in the open with our cameras are happy memories with most of us, and in the future I trust that these happy days and memories will come to all of us.

W. J. CROALL, F.R.P.S.

ROYAL Institution.—The following are the lecture arrangements at the Royal Institution, after Easter:—Dr. Allan Macfadyen, six lectures on Cellular Physiology, with special reference to the Enzymes and Ferments; Professor William Knight, two lectures on The Philosophical Undertones of Modern Poetry (the Tyndall Lectures); Mr. Roger Fry, two lectures on Naturalism in Italian Painting; Sir Alex. Campbell Mackenzie, three lectures on Arthur Sullivan (with vocal and instrumental illustrations); Professor Dewar, three lectures on The Chemistry of Carbon; Professor W. M. Flinders Petrie, three lectures on The Rise of Civilisation in Egypt; Professor J. B. Farmer, two lectures on The Biological Characters of Epiphytic Plants; Mr. J. Y. Buchanan, three lectures on Climate: its Causes and Effects. The Friday evening meetings will be resumed on April 19, when a discourse will be delivered by Professor J. J. Thompson on The Existence of Bodies Smaller than Atoms. Succeeding discourses will probably be given by Dr. Hans Gadow, Mr. Charles Mercier, Professor Jagadis Chunder Bose, Mr. Richard T. Glazebrook, Mr. A. Henry Savage Landor, Earl Percy, M.P., and other gentlemen.

MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

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THE CAMERA CLUB.

In the months of December and January last, we referred at some length to the excellent efforts being made by the new executive of the Camera Club to popularise that institution amongst photographers. It is not necessary for us to go over the ground again, but for the information of any of our readers who may be desirous of becoming members of the Club we append the essential portions of the prospectus. The annual subscription is: For town members, five guineas; for country members, two guineas; and for foreign members, one guinea. A member having a residence, place of business, or regular occupation within the London Postal District, is considered a town member. A member residing throughout the year aboard is considered a foreign member. Members admitted between April 30 and December 1 pay to the end of the year at the rate of ten shillings for each calendar month for town members, four shillings for country members, and two shillings for foreign members. Members elected on or after December 1, pay the full annual subscription, which covers the ensuing year.

The entrance fee is 5*l.*, but this will not be exacted in the case of the first 100 members elected after 1st January, 1901, in whose case the entrance fee will be 1*l.* The entrance fee for foreign members, as long as they continue to be such, remains as heretofore, 1*l.*, but foreign members becoming town or country members will pay an additional entrance fee of 4*l.* An ordinary fully paid share will be allotted without further payment in accordance with Rule 4.

Members may be admitted as life members on payment of ten years' subscription, from which those applying for life-membership within three months after election may deduct the previous payment for subscription.

Officers of the Army or Navy on the active list, and members of such recognised clubs as shall be approved by the Committee, may be elected without proposer or seconder.

The election of members is in the hands of the Committee.

The Club combines the ordinary advantages of a social club with the appliances and conveniences of a photographic and scientific society.

The Club premises include the following conveniences and advantages: a studio complete with all necessary apparatus, and an enlarging and reducing room, provided with artificial light, each with its own dark room attached; several separate dark rooms, a laboratory for daylight operations, an arc-lamp apparatus for printing, a workshop with fitted lathe and other mechanical appliances, a billiard room, library, dining room and large reading room.

During the winter season, from October to May, meetings are held on Mondays and Thursdays for the reading of papers, for demonstrations, or lantern-slide exhibitions, and during the season concerts are occasionally given. Photographic exhibitions are held in the Club house from time to time, the members' annual exhibition being held in the Spring.

A Club Journal is published, and sent free monthly to members.

Applications for membership should be addressed to the Secretary, 28 Charing Cross-road, W.C. A list of the members will be sent to any gentleman desiring it, to enable him to select a proposer and seconder. The applicant must be personally known to both proposer and seconder.

The officers of the Club are as follows:—

President: Sir William de Wiveleslie Abney, K.C.B., F.R.S., &c.

Committee: Andrew Pringle, *Chairman;* Enrico Ferrero, *Vice-Chairman;* Percy E. Marshall, *Chairman of Finance Committee;* H. Thomson Lyon, *Chairman of House Committee;* Phineas S. Abraham, M.D., F.R.C.S.I.; A. C. Beard; Thomas Bedding; J. W. Cadett; R. W. Craigie; Earl of Crawford, K.T., F.R.S.; H. E. Davis; Rev. N. R. Fitzpatrick, M.A.; E. H. Laurie; H. H. O'Farrell; A. R. Price; Earl of Rosse, K.P., F.R.S.; D. G. Thomson, M.D.

Hon. Legal Adviser: W. Asbury Greene.

Hon. Secretary: H. H. O'Farrell.

Hon. Librarian: Lyonel Clark.

Hon. Assistant Librarian: William Brooks.

Secretary and Manager: George A. Richardson.

Bankers: Martin's Bank, Limited, 61, Lombard-street, E.C.

PANORAMIC PHOTOGRAPHY EXTRAORDINARY.

By the courtesy of Mr. L. Hart, of Kekupua, Kanai, Hawaian Islands—a gentleman who contributed to these columns thirty-eight years ago—we have received a copy of a remarkably beautiful panoramic photograph of the port and town of Honolulu. It measures about thirty-six inches by six inches, is printed on bromide paper, and makes a magnificent panorama of cloud, mountains, shipping, town, and sea. Mr. Melvin Vaniman, of Messrs. King Brothers, Honolulu, who took the photograph, used a panoramic camera of his own construction, fitted with a Goerz lens of ten inches focus. Mr. Hart also kindly sends us a copy of a local paper from which we extract the following account of the difficulties faced and overcome by Mr. Vaniman in his attempt to take a panoramic photograph from the top of a ship's mast:—

"Melvin Vaniman, of King Brothers, found the opportunity for which he had been waiting for months, and at the risk of life and limb accomplished the triumph of a perfect reproduction of the beautiful view that bursts upon the gaze of the stranger as he enters Honolulu's harbour; from the curling white circles of surf at the foot of Diamond Head to the peaceful little valley settlement of

Kalihi, with a truth of detail unexcelled in photography and faultlessly catching the charm of cloud effects that add so much to the other beauties of the Islands. With a camera which had been studied out and built for the purpose by Mr. Vaniman himself, he climbed to the top of the tallest mast of the barque *Gerard C. Tobey*, and, in a gale of wind that threatened to blow the enterprising photographer aud his camera into the sea, lashed himself and apparatus to it. Captain Gove of the *Tobey* had invited Mr. Vaniman to use his vessel in any way that he might see fit, but when he found that it was the purpose of the photographer to climb the mast for his bird's-eye view, he was extremely doubtful, and advised him not to do it. Mr. Vaniman, however, on the keen scent of a great art triumph, refused to be dissuaded, and began to climb, lugging his apparatus under his free arm. Being a 'land-lubber,' his progress was slow, and the captain took his burden from him, hurrying nimbly up the rigging. Mr. Vaniman followed, and with much difficulty managed to get over the rim of the fore-top and ascend the mast. A dizzy climb of over ninety feet brought him to the royal yard at the top, where the captain waited with the apparatus. The captain and the photographer seated themselves upon the yard with the heavy camera between them, and the sailors below hoisted the yard as far as it would go, to the top of the ropes. It would have been impossible to have obtained the view at a lower point, as the ropes would have intervened. The captain descended, leaving the daring 'land-lubber' to his task.

"In speaking of his experience, Mr. Vaniman says it is one that he could never be prevailed upon to undergo again. The wind was blowing at a rate calculated to make one's hair stand on end to think about it, and the cumbersome camera-box, nearly a yard long and over a foot in width and thickness, bobbed about and threatened to fall from the yard with every pitch of the vessel. Down below the sailors looked like lively little pigmies at their work on deck. The great mast swayed back and forth, and the wind flapped loose ropes about and whistled through the taut ones. His hat gone and his head in a whirl from the dizzy height of his lonely perch, Mr. Vaniman got his apparatus in readiness, first lashing himself to the mast with a rope which he had worn about his waist.

"His feet rested on the wobbling block of the royal yard, and he was compelled to lurch each way with the swing of the mast to avoid losing this uncertain foothold. After securing himself, the photographer lashed a triangle, which he had provided for the purpose, to the mast, forming a support for the camera, which he put in position and focussed. While climbing up the mast the wind had blown the cap from the lens, and a substitute was made from a piece of paper which the photographer had in his pocket. Finally, when everything was in readiness to take the picture, a great cloud floated over the city, throwing the whole view into the shadow, and there on his lofty, uncertain perch, with the wind blowing at thirty-five miles an hour, the plucky photographer was compelled to wait for two hours and a half. But for the cloud it would have been an ideal moment, as the atmospheric conditions were perfect for the purpose, and the sun shone brightly over the whole scene. Mr. Vaniman has been for months studying chemical effects in photography, and he hoped to catch the natural form and shading of the clouds. He was about to give up his attempt in despair when the mass of cloud began to move and floated off Mauka way, trailing its vast shadow over the slopes leading up to the mountains. It was Mr. Vaniman's chance, and, waiting for the mast to swing level, he quickly touched the little lever that operates the shutter. He had every reason to believe his venture a success, but there is many a slip 'twixt the exposure and the print, and he sought to make sure. Three times he went through the process of taking out, turning around and replacing the plate-holders and pressing the lever. Each process was accomplished with the greatest difficulty.

"With one arm around the mast to secure himself and to grasp the camera, with the other he took out the plate-holders and replaced them. The swaying of the mast rendered it almost impossible to keep the plate horizontal with the view, and two of the plates were spoiled on this account. The third was a success. When the feat of descent had been safely accomplished, Mr. Vaniman found himself in a half-fainting condition, the two-hours-and-a-half nervous strain having taxed his strength severely. His triumph, however, when his success was assured, was enough to repay him for the experience, though he will climb no more masts for all the pictures in Christendom."

Mr. Vaniman has our congratulations on his assiduity and success.

CHAPTERS FOR BEGINNERS IN PHOTO-MICROGRAPHY.

II.—Medium-power Photo-micrography.

Having once become thoroughly at home with the general methods of low-power photo-micrography, and gained some modicum of success, it is not very long ere we find that it is quite impossible to work any longer without a microscope. In other words, we make up our mind to venture on new ground, and to try our luck with medium-power photo-micrography.

As regards the necessary apparatus, the same rule applies to medium-power, as to low-power photo-micrography, namely, that it can be as simple and inexpensive, or as elaborate and costly, as our purse and inclination will permit; and it is astonishing what good results may be obtained for a very small outlay. At first, it is most desirable that only apparatus which is absolutely necessary for the work in hand should be purchased; the little accessories and conveniences can very well wait—moreover, their aid will be better appreciated when sufficient experience has been gained to realise their value in helping to perfect or simplify our work.

The best plan is to decide upon the sum of money which is to be expended, and then look through the catalogues of the recognised makers of microscopes, and find out, *not* how *large* a quantity of apparatus can be obtained for the price, but how and where we can obtain the *best* for the amount at our disposal.

The microscope itself is the most important piece of apparatus, and therefore the bulk of the initial outlay should be expended upon it. It is far wiser to obtain a really good serviceable microscope at once, than a cheaper and inferior instrument which will have to be discarded later on. In the first place, a first-class instrument will last a life-time with proper care, it will always be a pleasure to work with, and additional apparatus can be added to it from time to time, as the necessity or opportunity arises; whereas, with an inferior instrument, really satisfactory results will only be obtainable with great difficulty, if at all, and when at last it is discarded in disgust, probably most of the additional apparatus that has been added to it, will not fit on to the new stand. Therefore it is better to get a good microscope stand and only one object-glass and one eye-piece, than an inferior stand and several lenses.

In choosing an instrument the tyro will do well to call in the aid of some one who is thoroughly familiar with the microscope and its construction. If however, he has no microscopical acquaintance, he cannot do better than pay a visit to one of the old-established and recognised firms of microscope makers, such as Messrs. R. and J. Beck, Ltd., of Cornhill; Messrs. Baker, or Watson & Son, both of High Holborn, who have all high and world-wide reputations, and in whose hands he may safely leave the selection.

A serviceable microscope stand must be as solid and rigid as possible, no matter at what angle the body-tube may be inclined. The body-tube and substage should be fitted with the standard thread and gauge of the Royal Microscopical Society, as all the lenses made by the best makers are fitted into mounts bearing this standard thread. The coarse-adjustment, for focussing with the low magnifying powers, should be by spiral rack and pinion; and the fine-adjustment for focussing with the higher powers, by fine micrometer screw.

Beneath the stage on which the objects to be examined or photographed are placed, there should be some form of mechanical substage to carry the substage-condenser and other apparatus. The "Student's" microscopes which the three firms quoted above supply at very reasonable prices, will be found to meet all requirements.

The microscope difficulty solved, we have to consider what lenses and additional apparatus we shall require. A couple of object-glasses, and two or three eye-pieces, will be found ample to begin

with, and will give us a very good range of magnification. The object-glasses should be 1 in. and ¼ in., or ⅔ in. and ⅙ in., respectively; and the eye-pieces, if by an English maker, Nos. 1, 2, and 3; if of Continental manufacture (such as those of Leitz), Nos. 0, II., and IV. This will give a range of magnification from 49 to 510 diameters with the 1 inch and ¼ inch object-glasses, or 68 to 760 with the ⅔ inch and ⅙ inch, when used in combination with the three eye-pieces.

In addition to the object-glasses and eye-pieces, some form of sub-stage condenser for use with the higher magnifying powers will be necessary; that known as the "Abbé Condenser," is a very useful form for general work, and can be obtained for about fifteen or twenty shillings to fit a "Student" model microscope. A "bull's-eye" condenser will also be required.

The whole of the apparatus I have just described, consisting of a Student's microscope, two object-glasses, three eye-pieces, Abbé sub-stage condenser, and a bull's-eye condenser, at the lowest estimate for real use and efficiency, will cost about 7*l.* 10*s.* to 8*l.*; but as all these parts can be purchased separately, the tyro may very well content himself with buying just the microscope stand, one object-glass (say the 1 inch or ⅔-inch), and two eye-pieces, to begin with. This small set of apparatus will enable him to make a very good start, and to obtain very satisfactory and interesting results.

Having obtained the microscope, the next proceeding is to make a stand to carry both the camera we have used for low-power photo-micrography, and the microscope. This stand is practically identical with the one already in use for low-power work, save that the rails on which the object-carrier travels are either altogether absent, or arranged for use with the camera-stage. It is very important that the bellows of the camera to be used for medium-power work may be extended by racking or pulling out backwards, as well as by the usual forward motion; the greater lengthening of the bellows must be obtained by the backward movement, as the microscope must remain in a firm and rigid position upon the baseboard. If, however, the camera is not capable of very great extension backwards (that is to say, the bellows can only be lengthened by racking them forward), the difficulty will have to be overcome by mounting it on a travelling stage that can be pushed backwards and forwards along the rails, and clamped in any desired position.

Having drawn a truly central and straight line down the whole length of the four-feet board, which acts as a baseboard to carry the camera and microscope, rack out the camera until its fullest extension of bellows is reached, then place it on the board, and carefully centre it with the aid of the central line. When racked out to its greatest length, the focussing screen and dark-slide of the camera should be flush with one end of the board. The camera centred, take the microscope and place it on the board at a little distance from the lens-flange of the camera, and bend the body back into a perfectly horizontal position, taking care that both the stand and body of the instrument are central. The now horizontal microscope tube will probably be a good deal above the lens-flange of the camera; to rectify this, several thin books and journals (The British Journal of Photography will do admirably), must be placed beneath the camera to raise it to the proper height, when the microscope tube will be exactly in the centre of the opening. As the opening into which the photographic lens fits will probably be a good deal larger than the tube of the microscope, a smaller flange with a tube just large enough to slip over the microscope body-tube must be made. This tube should be covered with a velvet hood, with a piece of silk eye-glass cord run in, so that it may be drawn tightly over the junction between the two tubes, and prevent any light getting through into the camera to fog the plate.

Screw the 1-inch object-glass on to the microscope, and remove the eye-piece; swing the mirror away to one side, and place the photo-micrographic lamp in such a position as to evenly illumine the field, which should appear on the centre of the ground-glass focussing screen of the camera as a bright circular disc.

Having made sure that the circular field of view on the ground-glass screen is perfectly central, carefully measure the exact height of the pile of journals, and build a wood stage of that height, to which the camera can be securely fastened. While the microscope is still in its proper central position on the board, take two fillets of wood and screw them, one on each side of the foot of the microscope stand, on to the baseboard, so as to form a perfectly central groove into which the microscope can be pushed. If this is done carefully, the microscope when placed between the two pieces of wood will always be central with the camera: and thereby much time and labour will be saved. The box or stand for the lamp used for illuminating the object to be photographed, may, with great advantage, be centred in the same manner.

A simple but effective arrangement for final focussing with the "fine-adjustment," may be made in the following manner: Procure from the ironmonger two of the small brass brackets generally used for fixing up light roller-blinds; on to the right-hand side of the baseboard, and almost flush with the camera, screw one of the brackets, fastening the other in a line with the first on the same side of the board, and just beyond the coarse-adjustment. Now obtain a thin brass rod, about three inches longer than the intervening space between the brackets, and thread it through the hole in each bracket intended for the ends of the roller-blind to fit into. A small wood or metal wheel with a groove turned round the top must be fastened on to the brass rod exactly opposite the fine-adjustment of the microscope; a similar wheel must be fastened at the camera end of the rod to act as a handle for focussing. A silk cord, which has been rubbed on a piece of resin to make it "bite," is fastened into a loop to go over the fine-adjustment milled head of the microscope and the wheel of the focussing-rod. It must only be just tight enough to "bite" the milled head and wheel, so that they revolve when the focussing-rod is gently turned, but must on no account be so tight as to produce any strain or pull upon the delicate fine-adjustment of the microscope.

A piece of cardboard, which can be placed either between the object-glass and the specimen, or, if the ¼-inch or ⅙-inch object-glass is being used, directly behind the stage of the microscope, forms the best shutter for cutting off the light when placing the dark slide in the camera and making the exposure.

The stand finished, and the camera, microscope, and lamp placed in position, we make our first attempt at Medium-power Photo-micrography. The one-inch object-glass is screwed on to the microscope, the eyepiece removed, and the velvet hood carefully fastened on to the body-tube of the instrument, and the lamp lit and centred so that the whole field of view is evenly illumined. On the stage of the microscope is placed the object we wish to photograph, say, the leg and foot of a Blow-fly or Drone-fly (Syrphus). Extend the camera bellows to eight inches, and focus the object roughly on the ground-glass screen, using the coarse-adjustment of the microscope for the purpose. Now substitute the sheet of plate-glass for the ground-glass, and connect the fine-adjustment with the focussing-rod by means of the silk cord. Examine the image on the plate-glass screen with the aid of the hand focussing-glass, gently turning the focussing-rod round to right or left until the object is perfectly sharp. Place the card in front of the object-glass to cut off the light, insert the dark slide in the camera, and proceed to expose the plate, taking the greatest care when removing the card not to touch or jar the apparatus, or the table on which it rests, in any way. The length of exposure will depend entirely upon the speed of the plate used, the actinic power of the illuminant, and the transparency of the object. Supposing the plate to be a backed Edwards' instantaneous isochromatic, the light a good round-wicked paraffin lamp, and the drone-fly's foot, mounted in Canada balsam, fairly transparent, from fifteen to eighteen seconds will be about the right exposure.

With the eight-inch extension of camera bellows and the one-inch object-glass, we shall have obtained a picture showing the general appearance of the leg and foot of the fly. Having taken a successful negative of this, we next proceed to take a photograph of the foot alone, to show its interesting structure and the curious "pads." To do this, the eye-piece is replaced in the tube of the microscope, and the camera bellows drawn out to twelve or fourteen inches. The object will probably have to be re-arranged, so as to bring the foot into the centre of the field; and the light adjusted to give an even illumination. The additional magnification will be found to have

cut off a good deal of light, and the focussing will require to be very delicately and carefully done, as a comparatively slight movement of the focussing-rod to the right or left upsets the focus. When the image appears to be satisfactorily sharp upon the screen, wait a few moments to allow for any expansion or contraction of either the microscope or camera to take place; and then, having made sure that the insect's foot is still perfectly in focus on the screen, place the card behind the microscope stage, to cut off the light, insert tne dark slide, and expose the plate. About thirty-five or forty seconds will be found to be sufficient exposure to obtain a satisfactory and plucky negative.

The beginner should practise taking photo-micrographs with the one-inch object-glass alone, in combination with the eye-piece, and with varying extension of bellows, until a fair amount of experience and proficiency has been gained. Indeed, he will find that there is a vast array of wonderful and interesting microscopic objects which do not require a higher magnifying power to reveal their hidden beauties, and which will keep him busily occupied for many a long day and evening.

With a thorough knowledge and experience of how to manipulate low and medium magnifying powers, the enthusiast will far more easily cope with the difficulties and troubles of high-power photo-micrography. F. Martin Duncan.

"THE MIRAGE OF BRISTOL," OR "THE SILENT CITY OF ALASKA."

By a curious coincidence, two London papers recently published reproductions of photographs purporting to be those of "the Silent City of Alaska." "It seems to be a work of supererogation to explain, at this late stage," says the *Western Daily Press* (Bristol), "that 'the Silent City of Alaska' is said to be a mirage of Bristol reflected over a distance of some five thousand miles. The story of this alleged phenomenon has already become quite elderly. It sprang into life about seven years ago, and during the interval it has passed through several phases of spasmodic vitality. It is remarkable, however, that some of the London papers have just discovered the story, and that they are inclined to treat it with all seriousness. There are evidences that the idea of 'the Silent City' is of American origin. The idea may have originally taken shape amongst the ice-bound solitudes of Alaska itself. Very probably it did, but the suggestion is that it was elaborated and 'improved' at the hands of some enterprising spiritualistic photographer in the United States At any rate, inquiry discloses the fact that some time in the year 1894 a fairly large photographic print was placed in the hands of the editor of The British Journal of Photography, and it was he who, jocularly, it is to be assumed, suggested that it represented, or resembled, a view of the city of Bristol that might have been taken from some such eminence as Brandon Hill. From this random identification the whole story appears to have been evolved, with such variations as seemed expedient for the time being. The editor of the British Journal of Photography, who is familiar with many aspects of Bristol, under varying atmospheric conditions, has more than once referred to this so-called 'mirage' in terms the reverse of complimentary regarding its authenticity. The journalist has been supported in his conclusions by Mr. W. H. Midwinter, the well-known photographic expert of Bristol. About a couple of years ago, Mr. Midwinter appears to have gone deeply into the subject, which is not devoid of the element of fascination, and he had no hesitation in declaring that the mirage picture of that time was the copy of a photograph of Bristol taken in the winter or early spring of the year on which the late Prince Albert Victor visited the city for the purpose of unveiling the Queen's Statue in College Green. Mr. Midwinter fixed that date because there was visible in the print the scaffolding erected around the western towers of the Bristol Cathedral, which were then in course of completion. The Royal visit to Bristol was in the summer of 1888, and it must, therefore, follow that if the photograph submitted to British experts as representing the 'mirage' as it appeared at Alaska, presumably about 1898, had been accurate, it certainly would not have shown the tell-tale scaffolding. Moreover, the mirage is said to only appear in the summer months, but the print shown had all the characteristics of a scene in early spring or winter.

"It would not be possible to find a more damaging analysis of the print than that formulated by Mr. Midwinter, who clearly suggests that no allowance was made by the exploiters of the print for those marks of identification that were merely temporary. Those who have taken the trouble to follow up the variations of this curious story of the freaks of refracted light, are now invited to believe that the aspects of the so-called 'Silent City' undergo constant change. The scaffolding may have by this time disappeared from the Cathedral towers, but with this exception, the alteration in the view presented, as it were, from Brandon Hill, has undergone extremely little change in these years. The Cabot Tower itself does not, of course, come within the purview of the camera, and that constitutes the most striking alteration in the locality said to be reproduced in the air-stratum that hovers above the Muir glacier in Alaska. The photographs reproduced in the London papers recently do not suggest any part of Bristol, as seen from Brandon Hill. There are towers and domes that cannot be recognised even by the most good-natured critics, anxious to perpetuate the fame of a natural curiosity. That some sort of atmospheric phenomenon, or optical illusion, may be witnessed during certain months of the year at Glacier Bay is scarcely to be gainsaid. The written testimony of explorers and scientists of eminence and integrity leaves to the sceptic no real ground from which he can adversely argue. But in the Arctic and semi-Arctic regions there are to be seen phenomena, startling in themselves, but fully explicable as the result of close investigation and the application of certain scientific rules. Nansen, and some of those who have preceded him, and followed in his footsteps, have beheld these curious sights, and the mirage in the tropical desert is a common phantasmagoria. What it is extremely hard to believe is that a mirage of Bristol city should be projected to the enormous distance specified, and yet remain compact and recognisable. Why should the city alone, and not only that, but a special district of it, be reproduced in the Alaskan atmosphere? Why should not some glimpse of the surrounding country be caught in this wonderful mirage? The more credible theory is that a unique cloud effect has been produced in Alaska; and that, in the first place, by an effort of imagination, combined with the skilful sophistication of a misty photographic negative, there has been presented some intangible conglomeration of spires and domes, and houses, that has been arbitrarily labelled as Bristol. The idea thus originated may have been elaborated in such a way as to bring, at one time, a real photograph of Bristol into use. But the chronological discrepancy detected by Mr. Midwinter seems to have shaken the foundation of belief for the time being, and something else has been substituted to keep the so-called scientific interest alive in the literally nebulous enterprise. A 'scientific expedition' is to visit the Muir glacier in the ensuing summer for the purpose of witnessing the 'mirage' and taking photographs of it. The *bona-fides* of this expedition may be beyond cavil; but it is necessary that the members should be in telegraphic touch with some one in Bristol, so that the precise conditions of atmosphere in this city should be ascertained at the moment the photograph of the 'mirage' is taken. These atmospheric conditions, which are evanescent, must be reproduced in the picture of 'The Silent City.' If they are not, then the whole theory of an aerial Bristol, reproduced five thousand miles away, falls to the ground. Mr. Midwinter is an expert on the question, and might well be the gentleman selected to perform the office of correspondent if he cared to accept it. Moreover, it is naturally to Mr. Midwinter that the members of the scientific mission ought to submit their photographic prints when they arrive in Bristol with the view to the pursuit of their inquiries as to identification. Either this 'mirage' story is the product of an abnormally fertile brain, or it is a scientific manifestation of the most exceptional character. The verdict as to the tenability of one hypothesis or the other ought to be recorded with the least possible delay."

OPTICAL CONSIDERATIONS OF THE LENS INVENTED BY DR. GRUN.

The principles involved in the formation of optical images are worthy of a short consideration. The source of all natural light is the sun. The rays of light proceeding from the sun must, on entering the terrestrial atmosphere, undergo refraction as coming from a rarer to a denser medium: this refraction appears sufficient to bring the rays to a diffused focus at or about the surface of the earth. This is capable of demonstration by aid of a card with a pin-hole in it. If a ray of sunshine coming through a window be intercepted with this card about six inches from the wall, where it would otherwise strike, it will be found that an image of the sun is formed on the wall, that is, it becomes visible, because it is not blurred by the diffusion of the adjacent images. If the card is removed some six or eight inches further from the wall, an image of the window becomes visible. This image is not formed by the pin-hole in the card, as is generally supposed. It is there all the time, but was not visible to the eye, any more than the stars are visible in the daytime. The interposition of the card, by cutting off the adjacent and superabundant light, has simply rendered the image of the window visible. All natural bodies act in regard to light in one of three ways. They either reflect, absorb, or transmit light. In the sun image formed on the wall of the darkened room, the image would be there whether the room were darkened or not, but it would not be visible to our eyes if the room were not darkened, as there would be a succession of images impinging on one another, these images giving rise to our impression known as light.

If, however, the light does not pass direct into the room, but first falls upon an object, such as a mirror, it may be reflected from that object, then an image of the sun is still obtained, or maybe the object absorbs a portion of the light and returns only certain rays, which may be either red, blue, or green; these rays pass through the aperture and still form an image of the sun, but of a different colour. At the same time the shape of the image may be altered, by certain irregularities of its edge, as well as colour, so the sun image is no longer round, but has an irregular shape, which we recognise as the image of a man, a house, or a tree. A number of these images more or less irregular in outline, and varied in colour, presented upon a plane surface, we describe as a picture, but they are nothing but altered sun images. If there be material of greater density than air fixed in our shutter aperture, the rays will be more strongly refracted, and will form an image nearer to the aperture or, as is said come to a focus sooner. If the transparent medium is bounded by convex surfaces a still greater shortening is effected. This shortening instrument is known as a lens. It is not essential that our shortening instrument should be of glass, but as nearly all other solid bodies do not transmit light, and as liquids must be contained within a solid receptacle, and as that receptacle must be transparent, it follows practically that glass must be used. If this be so, what is gained by using a substance other than glass? This is a question worthy of further consideration. In the first place, glass is not a fixed chemical compound, but is a mechanical mixture, difficult to produce, in exact proportions, every specimen varying more or less in composition; and even in solid block it is difficult to ensure homogeneity, hence the impossibility of making lenses of more than a limited thickness, or to guarantee the character of a lens when made.

These considerations led me to consider the possibility of constructing a lens of material other than glass. Dr. Blair many years ago had constructed a lens of hydrochloric acid, but this lens, owing to defects as to details of construction, was not a practical possibility, although the principle was correct. Subsequent to this the idea seems to have lain dormant, and it has remained to me to have the felicity of producing a lens which appears to be optically correct, and at the same time to be capable of standing the test of practical use. By making use of a fluid of the same refractive index as glass, not affected by temperature, without the liability of having currents set up within its confines, I have produced a lens of greater aperture than has hitherto been possible, a lens which has also much less obstruction to the passage of light, thereby giving greater illumination than a glass lens of the same relative aperture, and which I have now employed for three months without apparent deterioration. Such a lens requires more care than an ordinary lens, and can be renewed at much less cost than a high-class glass lens of similar aperture.

A lens of this aperture can always, if required, be reduced in aperture for daylight use, but with very rapid exposure the larger apertures can be used equally well for day as for night. With the aperture f-1 the light of one incandescent lamp immediately over the object will give a photographic impression in one second. By calculation I consider that strong daylight is equal to 1600 incandescent lamps, so that an impression should be obtained in $\frac{1}{1600}$ of a second by daylight. In conclusion, I beg to state that though the opinions expressed as to the formation of images may be somewhat original, they are based upon actual experiment, and are open to further discussion.

Edward F. Grun, M.R.C.S., L.R.C.P. Lond.

SCOPE FOR INVENTIVE BRAINS.

Dr. Grun announces in The British Journal of Photography of the 12th ult., that he has evolved a lens working at f-1.5 and f-0.84. The Editors of the Journal, after an inspection of the lens, set their independent seal of approbation upon it, stating that "instantaneous work by ordinary artificial illumination may be successfully accomplished by its means." This is an immense stride onwards, patent to anybody with the slightest knowledge of the rigid bonds that enclose him as a photographic worker. The possibility of working, as Dr. Grün has done, "by ordinary gaslight," and of gaining "stage effects with ordinary illumination, instantaneously from the auditorium," at once means more than doubling the present area of photographic work. The pleasantest portion of the life of the majority is lived more under gaslight than sunlight. We are but a short distance from the practicability of preserving a Salisbury, Rosebery, or Chamberlain laying Empire blocks in a speech. Such a lens as Dr. Grün's used in a panoramic camera might have given us the late Irish disturbance in the House of Commons as an edifying picture in the next morning's illustrated paper. Combined with a cinematographic element, it would be more effective still, and the result used to advantage—or disadvantage—upon a screen in a political meeting. The possibility of being so embalmed on a film would also certainly react to great advantage upon speakers and actors. Church interiors, very beautiful as they have been portrayed, can now have the breath of life, hitherto rather painfully absent, put into them by the added congregation, choir, and clergyman. Still better than in recording public functions, which, however interesting and important, cannot touch so closely as the immediate personal, the recording of home scenes around the fire side is brought within reach. There is no need to enlarge upon this point, for surely all who have watched children at work and play must often have been struck with regret at the impossibility of preserving a telling attitude or situation. It is now evidently possible, and will soon become easily practicable.

Dr. Grün's success suggests more broadly still the very extensive and agreeable possibilities open to an inventive brain in the photographic field. The inventive faculty is so much a thing of itself that there is no necessity for bracketing as essential with it, at least the highest, technical knowledge. Striking inventions have come, as a rule, from outside the professional ranks most concerned with them. The deeper the wearing down of a confining groove the more difficult is it for the one in it to take the broader look around necessary to successful invention. A fair knowledge is, of course, needed No one unfamiliar with the principles of optics and the forms of lenses, for instance, could reasonably be expected to invent a new lens. A fair knowledge of chemistry is essential to the evolving of a new emulsion, or fresh method of development; of electricity, to improving upon the construction of Röntgen ray apparatus.

But beyond all these technical necessities there is a wide field for an observant eye that can form a pathway for itself, shorter or pleasanter than the existing one, from one point to another. It goes without saying that it may also prove an exceedingly profitable field. How can the dark room be done away with? It certainly will be done away with in due course, and the man who shows how will have his name handed down to photographic posterity as one upon which

to always call a blessing. Until such time, is there no way of doing away with some of the dark room discomforts? For instance, must all the light come in through one small coloured square? Is it not practicable to have as well a band of similar, or of a safe other coloured light, introduced above the working level, that would make the room wonderfully more cheerful, and yet leave the worker perfectly safe in the only working position he always takes in it? Such a light directed against a shelf of bottles, and the door, would be a great convenience. Another item in which the exercise of a little inventive power would be well directed would be in a simple and easy method by which the right side of a piece of bromide paper could be instantly seen, and confidently accepted. The direction to place it on the hand, and watch its curling, is all very well, but it wants too big a hand for a 10×8 piece. Neither, for smaller pieces, can hands be kept perfectly dry and chemically clean—a fact sometimes made evident in the finished print if the sensitive side should have been placed downwards in the test.

To those sprightly individuals with so much sunshine in their souls that the inconveniences and the depression of the dark room do not affect them, there are plenty of other directions for the exercise of their thoughtful inventive energies. The printing frame is far from perfect. The print cannot be seen as a whole, and the part we particularly wish to see, seems to be generally clipped tightly down on the negative at the joint. It can hardly be said that the camera has not lent itself to the inventor—within certain bounds, that is. The latest up-to-date camera, like its user, is wonderfully and fearfully made. Not the least remarkable part about it is that so many good pictures have been taken by it, the possibility of forgetting something or other amongst its many movements and screws being so great. But the camera in essentials to-day is the same as it was thirty years back. It is still "a concertina on sticks." With aluminium as light and flaky as paper, is there no room for a novelty, if not an improvement? The tripod, "combining," according to the advertisement, "great rigidity with extreme lightness," has yet to be constructed. Possibly it might be found more easily in a quadrupod! The focussing cloth could not be regarded as anything but a remnant of the "dark ages," were photography old enough to father it so far back. With the lightest breeze blowing it is extremely trying and inconvenient; and, breeze or no breeze, makes one feel small, and look silly, when using it. Some substitutes there admittedly are, but they cannot be of much value, or their adoption would have been general.

And so on, if need were, along the whole photographic line, from buying the plate to hanging the picture, weak spots that need strengthening could be pointed out. The pointing out that has been attempted has not been done in any carping and disagreeable, but rather in a reasonably tolerant and good-natured way, we trust. The aim has been to suggest the room for improvements, and the wide scope for active and inventive brains. There is money in it, too. If we drop into a state of satisfaction with things as they are, there will never be any advance. We will unconsciously accept the existing order of things as permanent and unalterable, or, at the best, simply devote time and energy to polishing up within narrow limits. A departure, such as Dr. Grün's, apart from its own intrinsic value, acts as a stimulant and a bracing tonic. We are, by comparison, but on the fringes of photographic possibility. The future photographer will probably not carry a camera at all. Instead, he will pass a small pocket lens in front of a block of prepared papers, such as we see now put up for use of sketchers, and by rubbing half a thimbleful of developing powder over the surface gain his picture as a direct positive, and in colours. It looks improbable enough to-day, it must be admitted, but so would the possibility of telegraphing through a chalk cliff without using wires a dozen years back. This has been accomplished. So will in due course the at present apparent photographic impossibility, little by little, the best inventive brain power being used in the process.

J. Rees.

PATENT-LAW REFORM.

[A Paper read before the Society of Arts, April 24, and printed in its Journal.]

I.

During the last few few years a growing dissatisfaction has manifested itself with the working of the patent laws in this country, and various suggestions have been made as to how they could be improved, most of which advocate a strict preliminary examination.

As the Society of Arts initiated the agitation which led to the "Patents Act, 1883," it may not be out of place to raise the question again before its members, and this paper is intended to start a discussion on the subject by making suggestions how alterations of the present law might be made to the advantage of the public as well as of the inventor.

In order to fully appreciate the present position of the patent laws, it will be useful to give a brief outline of their historical development, and also to indicate a few of the characteristic points of foreign patent laws by way of comparison.

The earliest grant of a monopoly appears to have been made by Edward III. in 1331 when he granted letters of protection to John Kempe, a native of Flanders, to enable him to set up the industry of cloth-making in England;[1] but this Royal prerogative was not often exercised until the reigns of Henry VIII. and of Elizabeth. During the latter's reign serious complaints were raised in the House of Commons in reference to abuses of this privilege.[2]

It is significant that the Queen did not pretend that she could create monopolies at her pleasure, but the preambles to the instruments conveying the grants always set forth some public benefit to be derived from their action. Towards the end of her reign the incidents of a valid monopoly patent were stated by Fuller, one of the counsel for the defendant in the case of Darcy v. Allin, in the following passage, which has been frequently quoted as a correct exposition of the law:—[3]

"Now therefore, I will show you how the judges have heretofore allowed of monopoly patents, which is that where any man of his own charge and industry or of his own wit and invention doth bring any trade into the Realm, or any engine tending to the furtherance of trade that never was used before, and that for the good of the Realm; that in such cases the King may grant him a monopoly patent for some reasonable time until the subjects may learn the same, in consideration of the good that he does bring by his invention to the commonwealth; otherwise not."

In spite of promises to the contrary, the abuses in granting monopolies continued, until, during the first Parliament of James I., a "Committee of Grievances" was appointed to investigate the whole subject.[4]

As a result, after a protracted struggle with the King, the "Statute of Monopolies (1623)" was passed, by which all monopolies were abolished with a few exceptions of a temporary character, and the most important exception set out in Section 6:—[5]

"Provided also . . . . that any declaration before-mentioned shall not extend to any letters patents and grants of privilege for the term of 14 years or under, hereafter to be made, of the sole working or making of any manner of new manufactures within this Realm to the true and first inventor and inventors of such manufactures, which others at the time of making such letters patent and grants shall not use, so as also they be not contrary to the law nor mischievous to the State by raising prices of commodities at home, or hurt of trade, or generally inconvenient . . . . ."

On the limiting words, "within this Realm," the interpretation has been based, which Lord Brougham expressed in the following terms:—[6]

"The patent law is framed in a way to include two species of public benefactors; they are those who benefit the public by their ingenuity, industry, and science and invention and personal capability; the other those who benefit the public without any ingenuity or invention of their own, by the importation of the results of foreign inventions. Now the latter is a benefit to the public incontestably, and therefore they render themselves entitled to be put upon somewhat, if not entirely the same footing as inventors."

On these principles the whole patent legislation of the United Kingdom has been founded, but as Sections 10, 11, and 12 of the "Statute of Monopolies (1623)" and all subsequent Acts or sections of Acts referring to patents were revoked[7] by the "Patents Act (1883)" and its amending Acts (1885-8), it would be superfluous to enter into the details of the various stages of its development, and it is sufficient to give a succinct statement of the law as it now stands.

Monopolies for a limited period are granted to such persons who invent or import useful novelties, provided they describe in their specification the invention or importation in such a manner that a skilled person can carry out the manufacture after the patent has expired.

Every application for provisional protection and every complete specification is submitted to the Examiner, who has to consider and report to the Comptroller on the following points:—[8]

1. Whether the applicant has fairly described the nature of the invention.

2. Whether the specifications and drawings (if any) have been prepared in the prescribed manner.

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1 Wallace and Williamson, the "Law of Letters Patent for Inventions," page 3.
2 Ency. Brit., vol. xvi, p. 757.
3 W. and W., p. 7.
4 Ency. Brit., vol. xvi., p. 757.
5 W. and W., p. 608.
6 W. and W., p. 32.
7 W. and W., p. 645.
8 W. and W., pp. 286 and 288; also Sections 6, 7, and 9 of "Patents Act, 1888."

3. Whether the title sufficiently indicates the subject matter.
4. Whether the invention particularly described in the complete specification is substantially the same as that described in the provisional specification.

Where the Comptroller, after receiving the report of the examiner, refuses to accept a specification, or requires an amendment, the applicant may appeal from him to the law officer, whose decision is final.

The acceptance of the complete specification is advertised, and any person may give notice of opposition, within two months, to the grant of the patent on certain very limited grounds; if there is no opposition, or if it fails, the patent is sealed.

Simple as this procedure is, the patent law of France, passed 5th July, 1844, is still less exacting. An inventor or his assignee may obtain a patent for fifteen years for a useful and novel invention provided the application is made before the filing of the complete specification in foreign countries with certain exceptions, and provided that the invention is worked in France within two years of the date of the grant, and the working does not cease for any two consecutive years afterwards. In addition, the importation of the patented article invalidates the grant, except from a country belonging to the Union for the Protection of Industrial Property.

The French law stipulates further, that all articles labelled "patented" must bear in addition the letters "S.G.D.G." signifying "not guaranteed by Government," and the questions, whether a patented invention is really useful and novel, are only investigated in case of litigation.

In strong contrast to Great Britain and France, there is a very strict preliminary examination in the United States and also in Germany.

A highly trained staff of experts examine into the novelty of each application, calling the attention of the inventor to any prior publication that they may discover in any country.

In the United States the practice is to put the application in interference with any other application or patent already granted relating, in the opinion of the examiner, to the same subject, and a regular lawsuit follows to determine the priority of the inventions.

After one interference has been disposed of another may be discovered by the examiner and the whole procedure of hearing evidence of both sides has to be repeated, so that it happens not infrequently that a patent application is kept for years before the examiners.

In Germany the specifications and drawings, after they have passed the official examiner, are open to public inspection, and any objection raised by a member of the public will be considered by the examiners.

The object in both these countries is to give the inventor an opportunity of eliminating from his specification anything that may clash with prior rights, and to make his patent, after it has passed through the ordeal of severe examination, practically unassailable.

As already stated, this system has many admirers in this country, and lately the grievances of inventors relating to the preliminary examination of applications for patents have been exhaustively treated by Mr. Lloyd Wise in a paper read before the London Section of the Society of Chemical Industry. The remedies suggested by him were summarised in "Engineering" of the 23rd November, 1900, as follows:—

"The scheme is based upon the lines that:—

"1. It is desirable as far as practicable to afford to applicants for patents and to the public full information concerning the novelty of inventions in respect of which patents are sought.

"2. As, however, patents have sometimes been ultimately supported in respect of inventions which even eminent judges have regarded as non-patentable, it is not advisable in any unopposed case that a patent should be refused on the ground that the invention or alleged invention is obviously old or has been previously patented in this country, provided the applicant (if required) so amends his specification as to indicate what was previously known, thus protecting the public against being misled.

"3. Furthermore (provided that, if necessary, the applicant suitably amends his specification), it is not advisable either to make it publicly known that the specification has been amended at the instance of the Patent Office authorities or to give publicity to any official communication of any kind (whether by endorsement on the specification or otherwise), implying doubt as to the novelty of the subject matter in respect of which the patent is granted; because such publicity would obviously create prejudice against the patent, and where based upon erroneous opinion, would operate unjustly."

For the present purpose it is not necessary to enter upon the considerations which led Mr. Lloyd Wise to propound this scheme, as the summary clearly shows that he is in favour of making the examination for novelty much more exhaustive than it is at present in this country.

Before discussing this view further, it is very instructive to observe the trend of public opinion in a country where the examination is as strict as it can be made, viz., in Germany.

The position of affairs is very clearly explained in a paper read by M. von Hefner Alteneck before the Elektr. Techn. Verein, in Berlin, on the 27th March, 1900, in which he made certain proposals to alter the German patent law.[9]

In his opinion the examination system has serious drawbacks, which he summarises as follows:—

1. Important patents are not secured thereby against litigation.
2. Very heavy cost has to be incurred before the true value of an application is ascertained.
3. After a long examination the invention may become valueless through something better being found out in the meantime.

As M. von Hefner Alteneck expresses it: "At the time of application the invention is at such a tender age that it is unable to sustain the burden of a severe examination. All the same the inventor is forced to apply for a patent to secure his rights against other people whom he has to employ to work out the details of his invention."

As a remedy for these evils M. von Hefner Alteneck recommends that the inventor should have the option at the time of making his application, either to demand a patent in accordance with the present (German) practice, viz., strictly examined for novelty and utility, or to have the invention merely registered, in which case it would be examined somewhat in the same way as English patents are.

A registered patent should be convertible into an examined patent at any subsequent time whenever the inventor desires it. Should the registered patent fail to pass the examination, or if the examination is stopped before it is concluded, the patent becomes void altogether. It should also be competent for anybody to petition the Patent Office to annul a registered patent for specified reasons, but even if such a petition were successfully resisted the patent would remain a registered one. Any attempt to pass off a registered patent as an examined patent should be punishable.

M. von Hefner Alteneck mentioned in the paper that he had for a long time considered the American system greatly superior to the German system of examination until his faith was shaken by hearing an American inventor of great experience in patent matters express the fervent conviction that the German system was ever so much better than the American one.

During the discussion of that paper,[10] Mr. West defended the strict examination on the plea that a patent should be considered to be of the nature of a contract by which the Government for the valuable consideration of the invention, granted a monopoly which the Government should guarantee by establishing the novelty and utility of the invention at the time of granting the patent, and to meet M. von Hefner Alteneck's objection, Mr. West suggested the introduction of the American system of "caveat," to give the inventor time to develop his invention.

He further approved of the system of placing an application "in interference" with an existing patent for a similar invention, as this tended to diminish the necessity for large firms to have their own patent staff looking out for applications that might interfere with their rights.

Lastly, he suggested that no patent or publication more than fifteen years old at the time of application should be available for proving want of novelty, as he considered that an invention which has failed to find favour for fifteen years should not stand in the way of an inventor who may have hit upon an old idea which has become practicable through the general progress since it was abandoned. It may be added that the present practice in Germany is to preclude publications more than 100 years old from being used as anticipations.

On the other hand, Mr. Stort considered the existing patent system of Germany as inherently faulty, pointing out that none of the most important inventions had been successful in passing the ordeal, *e.g.*, in electrical engineering, no general patents had been granted for telephones, glow lamps, arc lamps, differential regulations of arc lamps, core carbons and wireless telegraphy; and that the master patent for three-phase currents had been declared void on account of not being worked.

He, therefore, supported M. von Hefner Alteneck's proposal, with the modification that anybody might ask the Patent Office to examine strictly a registered patent. He felt sure that by the system of merely registering patents in the first instance the work of the Patent Office would be greatly reduced, and, therefore, much improved.

The Chairman of the German Society for the Legal Protection of Industrial Property also spoke in the discussion and invited the Elektr. Techn. Verein to take part in a Congress of his Society at Frankfurt, where the subject would be further discussed, intimating that their proposal would include the recommendation to divide the examination, so that an application should at once be tested for novelty, and only later on for utility and ingenuity.

The proposals of M. von Hefner Alteneck were laid before the Frankfurt Congress by the delegation of the Elektr. Techn. Verein with the additional recommendation that the rule of the German

[9] E.T.Z., 5.4.00—p. 278. [10] E.T.Z., 10.5.00—p. 387.

patent law, limiting the right of the public to demand the revocation of a patent to five years from the date of the grant, should be abolished.

In the report[11] at the Kiel meeting of the Verband Deutscher Elektrotechniker, on the 18th June, 1900, it was stated that these proposals had not been accepted by the Frankfurt Congress, and in the discussion the fact was mentioned that at the end of five years three-quarters of the number of patents granted in Germany are void, or have been dropped. As a result another Committee was appointed to report on the advisability of advocating the establishment of registered patents in the sense explained in M. von Hefner Alteneck's paper. All these proceedings clearly demonstrate that the strict preliminary examination does not fulfil its object; nor is this to be wondered at, for no staff of examiners can possess the latest information in every branch of invention; moreover, such an inquiry is really an attempt at proving a negative. In addition, the improved means of communication place all civilised countries on such a footing of equality, that each phase of development in technical matters is known and studied in many countries at the same time. Hence it frequently happens that patents are applied for in several countries for similar inventions about the same time by different inventors. To minimise the difficulty arising therefrom a Union for the Protection of Industrial Property was founded in Paris in 1883[12] between the Governments of a number of countries, which Great Britain joined in 1884, as foreshadowed in Section 103 of the Patent Act (1883),[13] and the International Convention for the Protection of Industrial Property lays down the principles on which inventors are to be treated in the States belonging to the Union.

The most important articles of this Convention[14] are:—

"Art. IV. Any person who has duly applied for a patent, industrial design or model, or trade mark in one of the contracting States shall enjoy, as regards registration in the other States, and reserving the rights of third parties, a right of priority during the periods hereinafter stated.

"Consequently, subsequent registration in any of the other States of the Union before expiry of these periods shall not be invalidated through any acts accomplished in the interval, either, for instance, by another registration, by publication of the invention, or by the working of it by a third party, by the sale of copies of the design or model, or by use of the trade mark.

"The above-mentioned terms of priority shall be six months for patents, and three months for industrial designs and models, and trade marks. A month longer is allowed for countries beyond sea."

"Art. 5. The introduction by the patentee into the country where the patent has been granted of objects manufactured in any of the States of the Union shall not entail forfeiture. Nevertheless, the patentee shall remain bound to work his patent in conformity with the laws of the country into which he introduces the patented objects."

"Art. XII. Each of the high contracting parties agrees to establish a special Government department for industrial property, and a central office for communication to the public of patents, industrial designs or models, and trade marks."

Since this paper was first drafted the report of the Committee has been published which was appointed on the 24th May, 1900, by the Board of Trade to inquire:—

1. Whether any additional powers should be given to the Patent Office to prevent the issue of patents for inventions either obviously old or previously protected by Letters Patent in this country.
2. Whether any amendments are necessary respecting the granting of compulsory licenses (Section 22 of the Patents Act, 1883).
3. Whether the period of seven months allowed by Section 103 of the Patents Act, 1883, may properly be extended.

This last period refers really to the International Convention, and the Committee recommends the extension of the time to twelve months, subject to certain conditions, which do not concern this paper.

The subject of "strict preliminary examination" was very fully treated in the Presidential Address of Mr. J. D. Abel which he delivered to the Chartered Institute of Patent Agents on December 15th, 1897.

Among other objections he more particularly proved by the actual outcome of patent lawsuits in the various countries, that examined patents are by no means more secure against being declared invalid on litigation, than registered patents.

All this evidence clearly shows that a strict preliminary examination is not the final solution of the problem, and the dissatisfaction which exists at the same time regarding the mere registration of patents leads to the conviction that the modern efforts at legislation in patent matters must be based on faulty principles.

From the short historical summary given above it would appear that under both systems reformers and legislators have endeavoured to secure for the inventor a valuable monopoly as a reward for his ingenuity, and have lost sight of the considerations for which originally monopolies were to be allowed, in accordance with the wording of the Statute of Monopolies which permits "grants of privilege . . . of the sole working or making of any manner of new manufactures . . . which others at the time . . . . shall not use . . . . ." In other words, the privilege may be granted to inventors who "work" and "make," and it is made invalid only by prior "user." This view has been the keynote underlying the interpretation of the English law by the judges, who have held that the merit, which is rewarded by a monopoly, lies not in the invention of a new manufacture, but in the introduction of such a new manufacture to the public, so that the public derive a benefit from it.

In addition to the quotations given above, the words of Bacon may be cited in further support of this view, who says:—[15] "All prerogatives must be for the advantage and good of the people, otherwise they ought not to be allowed by law." Rewarding the inventor is, in short, a means to attain this end, but it should not be the ultimate object of the law. Mr. Abel expresses the same idea in a different way by the following words:—

"The patent should be granted to him (the inventor), first, as an incentive to him to use his best endeavours to practically carry out his invention, and to get it taken up by the industrial world; and, secondly, as a reward, not for his ingenuity, but for having produced something that will advance manufactures or otherwise benefit the community."

A reformed patent law should, therefore, have for its principal object the introduction of new inventions to the general use of the public, and while the interest of the inventor should not be entirely neglected, it should be subordinate to the "advantage and good of the people." To carry out this object, information about new inventions should be made readily accessible to the public, and every facility should be given to persons desiring to utilise an invention to obtain licenses from the patentee, and to overcome vexatious obstruction of any kind. As a matter of fact, a good deal has already been done to make information about novelties easily accessible to the public.

In accordance with Article XII. of the International Convention, the Governments belonging to the Union are exchanging their published patents, and exhibit them in their Patent Offices. Moreover, of late years, careful indexes have been drawn up at the Patent Offices, divided into classes, according to the subject-matter of patents, and abstracts of the patents are published, greatly facilitating research.

In addition to these official steps, an International Society has been founded for the Protection of Industrial Property, with a central office in Berne and an official organ, "La Propriété Industrielle." The aims and the work of this Society were explained to the members of the Society of Arts, by Mr. J. F. Iselin, in a paper read on the 18th February, 1898.

Last, but not least, the technical press describes every novelty at the earliest possible moment, so that there is ample material for the searcher after novelties, in the "patent" sense. All the same, great improvements can still be effected by collecting all these sources of information at the Patent Office, and indexing the contents, in a systematic way, according to their subject-matter. A manufacturer could then send, from time to time, to this office and ascertain what the latest discoveries in his particular branch were, and where he could communicate with the patentee, if a novelty is announced that appears useful to him. It is quite clear that for this part of the subject the provisions of Section 101 of the Patents Act, 1883, are sufficient, and that the actual steps already taken indicate that the demand for quick and complete information about useful novelties has made itself felt, and has been acknowledged to be a just one.

In reporting on the first point submitted to them, the Board of Trade Committee recommends that the staff of the Patent Office be considerably increased so as to be capable of examining every application whether it had been anticipated by any claims or descriptions in specifications of Letters Patent granted not more than fifty years before the date of the application under examination. If any such specifications are found, the inventor has to amend his specification, or a list is appended to it of prior patents which in the opinion of the examiner anticipate the claims. This recommendation agrees to a certain extent with the view expressed above, but the suggestion of Colonel Harding, supported by Mr. Spring-Rice, would exactly carry out the idea of making the Patent Office really useful for imparting information. This is practically that an inventor should not have the right of requiring the officials to make a search for him, but they should assist him, as they are in the habit of doing now, by pointing out to him how and where he can find information about the particular branch of industry to which his invention refers. A search among complete specifications only, as contemplated by the Minute of the Board of Trade appointing the Committee, is not satisfactory, as a negative result would tend to mislead the public and the inventor by inspiring a sense of security as to the validity of the patent; and the experience of other countries has abundantly shown that even the strictest preliminary examination fails to make a patent secure.

ALEX. SIEMENS.

[11] E.T.Z., 2.8.00.
[12] W. and W., p. 718.
[13] W. and W., p. 637.
[14] W. and W., p. 718, &c.
[15] W. and W., p. 2.

MONTHLY SUPPLEMENT

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AN AUDIT OF PHOTOGRAPHIC STORES.

It may have been in the West Indies, but perhaps it was in Australia; of the exact *locale* it is best to be uncertain. At any rate it was in one of His Britannic Majesty's Colonial establishments to which a small photographic department was annexed, and the Secretary came over to discuss matters of business with the Photographer, his first business being to fill and light his pipe. You see the Photographer had long claimed the privilege of smoking in his peculiar domain, even in office hours, as part and parcel of his work; for, said he, "it is necessary to counteract the irritating effect that the red light has on the nerves." Then the Secretary communicated the intelligence that the latest piece of "red tape" was to the effect that all photographic stores were to be taken stock of, and duly audited at least once a year.

"A pretty lively job," said the Photographer; "why, some of this stuff has been bought by the ounce, and used by the grain, for purely experimental purposes, in addition to which some of the stuff dates back to the *Challenger* Expedition. Now, there's that bottle of cyanide; I never open it now, except when somebody wants a dog poisoned, and, as that does not require much out of a jar that holds enough for fifty thousand dogs, the same amount will go on the list year by year, and they will wonder what the deuce we ever got it for."

"Can't be helped," said the Secretary. "Official regulations must be enforced. Now, you take stock to-day of all you have, and keep a credit account of all you take out. To make matters easy, let us tick off the titles of all you are likely to have on this dealer's list, so that I can fill up the form ready to hand over to the Auditor with the last year's accounts."

It was done. In due course the Auditor arrived, and with the Secretary invaded the Photographer's domain. Apparatus and plates were speedily disposed of, and duly ticked off in blue pencil. Then came the chemicals.

"Acids," said the Auditor. "Acetic, two pounds. Now look here! That's liquid, and how can you weigh it out?"

"Twenty ounces to the pint, and here's about a pint and a half," said the Photographer.

"Well, I suppose it's all right! Citric, twenty ounces. That's all right. Nitric—stop—that bottle is labelled 'Aqua fortis pur,' and I see it mentioned in these invoices."

"Same thing," said the Photographer. "Nitric acid is its chemical name, and 'Aqua fortis' its common or garden name."

"Very good," said the Auditor, "but don't attempt any weak jokes; this is business. Muriatic—three and a half pounds—confound your way of taking liquids by the pound, you'll talk of pounds of soup next; but stop a minute—there's hydrochloric on your list and on the bottle."

"Same thing is it? Then stick to one name, let's have your common or garden name that's on the invoice. Pyrogallic—how is it you have not got this down on your list? What do you say? Got it down with your other developing agents? Not exactly an acid? Then what do they call it one for? A nice job I seem to have this morning! Acetate of ammonia, one and a quarter pounds, nitrate of ammonia six pounds—yes, feels like that weight. Bromide of ammonium—say, what's the difference between ammonia and ammonium?"

The Photographer tried to explain.

"Dare say you're right but we'll take it as read. 'Liquor ammonia fort. ·880 and distilled water'—where's the distilled water—oh! so it's mixed, eh? Keep it half strength—then we'll call it Liquor ammonia ·440. What, no? Say its ·920 or thereabouts? How do you make that out? Half strength? Well, then, call it half strength and have done with it. How much did you say there was? Looks a very small five pints!"

"I've taken out two thousand two hundred and fifty cubic centimetres within the last few days," said the Photographer.

The Auditor sat on the edge of the hypo cask and mopped his brow. The Photographer got out a book of tables and worked out the sum-total. Then an inspiration seized the Auditor. "I'll tell you what to do, for if you cannot simplify matters you will be using logarithms next, and that sort of thing is weakening to the brain in this climate. Pour it into the ounce measure first, then into the other one, and deduct the ounces you put back into the bottle."

The Photographer promised to comply and the audit proceeded.

"Eikonogen. It's a wonder that you only have one name for that!" said the Auditor.

"I believe, if my memory does not play me false, that the correct name is the sodium salt of Beta-Naphthol-Amido-Sulphinol," said the Photographer.

The Auditor frowned severely and passed on to other items.

"Nitrate of Silver, twenty-four ounces. Stay! that bottle is labelled 'Arg. Nit.' When was it got? Five months ago? I don't see it on these invoices. What! One name on your bottles, another on the official form, and called Silver on the dealer's account. A word to you, young man; in fact, to both of you. Possibly you see something funny in this, but let me tell you that it is a serious matter to play practical jokes with His Majesty's Audit Office, or to amuse yourselves at the expense of the officials."

The Photographer meekly explained that it was purely unintentional, that this was the first audit, and that he had overlooked the multiplicity of names in chemical nomenclature, as well as the matter of liquid pounds and ounces, to say nothing of buying by the English system and using by the metric.

"That may be very true," said the Auditor, "but this sort of thing

is very informal, and may lead to abuse. I shall go through the remainder very strictly, and should I find any irregularity I shall at once report it. Now the next item is Sulphide of ammonium—a liquid, I see. Be so good as to measure it out that I may check the quantity."

Scarcely thinking of what he was about, the Photographer mechanically obeyed. "Great heaven!" said the Auditor. "Open that window."

"It's not made to open, sir. The ventilation blows in by the drainpipe, and goes out by that funnel near the roof."

"Then turn on the drainpipe, for it cannot be worse than this. While you are airing the place I will smoke a cigar outside."

Fortunately the Auditor had laid the papers down on the bench. Arising to the gravity of the situation, the Photographer and the Secretary proceeded to amend such apparent discrepancies as auric chloride and chloride of gold, ferrous sulphate and protosulphite of iron, sulphuric acid and oil of vitriol, spirits of turpentine and ol. terebinth, benzene and benzole, and so on. When the Auditor returned the inspection proceeded with comparative smoothness. And then the Auditor looked into the dark room. "What are all these bottles?" said he.

"Solutions made up, sir. The quantities are small, and as soon as taken into active use are marked off as actually used. You see, I thought you would consider grains and drachms too trifling to be noted minutely."

"You showed some sense there, any way. But, now, what is that in the corner that looks like a whisky-bottle?"

"John Robertson three star," said the photographer, "but you will not find it on the list of stock, nor yet on the invoices."

"No matter, I will audit that too." But the tone of voice, though apparently menacing, had a slight quiver in it, and the ghost of a twinkle appeared in the Auditor's eye. "Just hand me over one of those clean measures."

What he measured out he slightly diluted, and it was not returned to the bottle.

"Well, thank goodness I shall not be troubled again over this business for another twelvemonth! but, my dear fellows, do please have everything straightforward and shipshape on the next occasion. I have not *put down*, by the way, all the contents and quantity of that last bottle. Well, yes, I don't mind if I do!" SCIATHERAS.

RECENT AND PROPOSED METHODS OF PHOTOGRAPHING THE SUN'S CORONA.

[A paper read at the Stated Meeting of the Photographic Society of Philadelphia, March 13, 1901.]

THE problem of successfully photographing the outermost layer of the sun known as the corona, is a very difficult one to accomplish. This is chiefly due to the fact, that the brightness of the inner corona is several hundred times greater than its outward extensions. A proper time exposure for the inner corona is entirely too short to record the fainter impressions of the outer parts. The corona is visible only at the time of a total solar eclipse. The experience gained at one eclipse may not be of much advantage for gauging the time of exposure, as the brightness of the corona varies greatly at different eclipses. The same variation is true of the general sky illumination, which determines the character of the background upon which to photograph. In the shorter eclipses of two minutes or less, the general illumination of the sky is frequently quite bright, which is a great disadvantage.

The probable re-occurrence of an eclipse at any one locality is only once in nearly four hundred years.

With the possible exception of the eclipse which occurred in the Southern States last May, total eclipses of the sun seem to have a special fondness for the less-inhabited portions of the globe, so that the difficulties and cost of transportation of instruments is a very serious matter. This would not be so bad if there was a reasonable chance of the weather being clear, which is frequently not the case. Owing to the above and other difficulties, attempts have been made to photograph the corona in full sunlight. The reason the corona is not visible ordinarily, is due to the illumination of the earth's atmosphere. If it were possible to get above our atmosphere, simply screening off the sun's disc would render visible the corona. The brightness of our illuminated atmosphere is over sixty times that of the corona. Dr. Huggins and others have thought it possible, by means of photography, to detect differences of illumination less than one-sixtieth of that of our atmosphere and so obtain a picture of the corona in full sunlight. This was thought quite feasible, as the corona is much richer in ultra-violet light than the general sunlight. The photographs obtained from these experiments had an halation effect which was at first mistaken for the general outlines of the corona. Although successful results in this direction have been announced from time to time, none of them have been confirmed.

Within the last few weeks it has been announced by Deslandres, that he has been able to map the outline of the corona, by means of a very delicate thermometric apparatus. This, however, is not a photographic record of the corona.

The usual practice in photographing the corona is to have such an assortment of lenses, of varying focal length from a few inches up to 135 feet, such as was used in the eclipse of last May, with such a variety of exposure times, that at least some of the exposures will be correctly timed for the various parts of the corona. Negatives thus obtained show only one or rarely more special features successfully. In order to get the best results, as far as the whole corona is concerned, it has been found desirable to combine the special features from each of the negatives into a composite drawing. By this means some approach has been made to the appearance of the corona, as seen by the unaided eye or as viewed through the telescope. It will thus be seen that the great desideratum is a method of controlling the exposure of the various parts of the corona.

Professor Charles Burckhalter, of the Chabot Observatory, California, has succeeded in devising such a method of control. By means of a series of revolving diaphragms immediately in front of the plate and moving concentrically with the moon's image, it is thus possible to reduce the equivalent exposure time of the inner corona. By this arrangement, any desired increase of exposure can be given, from the sun's edge outwards to the end of the corona. Thus during a four-second exposure of the plate, the innermost parts of the corona can be given an equivalent exposure of ·02 of a second, so on increasing according to the relative distance from the sun, until the outermost extensions will have the full four seconds exposure. As the whole apparatus is under electrical control, it is simply a matter of turning a lever to the right or left, which will enable exposures to be made with an accuracy of ·01 of a second. The resulting negatives give the finest details of the whole corona that have ever been secured on a single plate. One of the negatives obtained by this method was quite unique in that the inner corona was greatly under-exposed, owing to the equivalent exposure being reduced to ·02 of a second. A comparison of a negative taken in the usual way, without this system of controlling exposures, in the same instrument as was subsequently used with the controlling device, shows at once the great superiority of this method, in not only giving details of the inner corona, but the outermost extensions as well.

But even with this arrangement, there is amply opportunity to make errors in the proper exposure times. This was the case when this method was tried in the India eclipse of 1898, when three times the proper exposure was made, giving a negative with no detail of the inner corona. If the corona was always of the same brilliancy in each eclipse, the matter would be simplified.

In this connexion, the method of coronal photography suggested by Professor Nipher is of considerable interest. He proposes exposing a plate to the corona long enough to obtain a positive, which is then developed in the light. The advantage of this method consists in the fact than an over-exposure, in the ordinary sense, is practically impossible.

In order to fully appreciate the nature of this method, a brief reference will be made to the subject of the production of positives.

Positives can be made from normally exposed plates, developed in he usual way in the dark room and then subjected to a strong light.

Negatives which are not completely developed reverse quicker than those fully developed. The writer has frequently completely reversed negatives into positives, after they have been over-developed as negatives, by subjecting them to the direct light of a Welsbach burner.

E. S. King, of the Harvard Observatory, has o served the reversal of negatives under similar conditions, in connexion with star spectra.

In some photographs sent to the writer, of the spectra of two adjacent stars, one star had all its lines reversed, while the star immediately alongside of it had only the lines of the shorter wavelength (in the violet) reversed.

The observations of Janssen, as published in the *Comptes Rendus* for 1880 and 1881, showed that the reversal of the negative produced by over-exposure was of a recurrent character.

By suitable over-exposure a positive is produced, whereas had it been exposed for a much longer time, a second negative would have been obtained. The positives were developed, however, in the dark room.

Professor Nipher has called attention to the fact, that as darkness is the proper condition for negative development, so is light the suitable one for positive development. The action of the development in the light, simply enables a good positive to be secured with much less time exposure than if the development were made in the dark.

When the proper exposure for a negative has been somewhat exceeded, the result will be an approach to a zero condition, which we understand generally by saying that it is fogged and nothing definite will develop. This condition can, of course, be averted by the use of restrainers, if the over-exposure is not too great.

If the over-exposure has been several thousand times too great for a negative, it will pass the zero stage and begin to enter the condition of a positive. In other words, it is an under-exposed positive, and what it wants is more light to help it along into the complete positive state, and hence the use of light in the process of development. In positive photography there is no danger from over-exposure. It is not my intention to go into manipulative details, as Professor Nipher has already published these, although from private correspondence I learn that he has made some improvements over his published work, to which, out of courtesy, I will not be able to refer.

The time of exposure for a well-lighted outdoor subject is from two to five minutes, which is rather long for the majority of eclipses.

The eclipse that occurs in Sumatra next May* will be of six minutes' duration, although in this case it would be desirable to take several photographs with the same instrument.

Professor Nipher's treatment of plates is not confined to positives, but negatives many hundreds of times over-exposed can be successfully developed as negatives in the dark room. This is a distinct advantage, and will be of great service in preventing the loss of plates (negatives) exposed in the ordinary way to the corona.

The great desideratum in this positive work is to reduce the time of exposure. In this line of experimentation the writer has been mostly interested. The plan of the investigation is to give the plate greatly reduced exposures for positive work, then trying to make up this deficiency of exposure by such subsequent treatment in various ways that the action on the plate will be similar to the action of light.

A very interesting line of investigation is to subject such an under-exposed plate to the influence of such radio-active substances as uranium, polonium, radium, and actinium. Such substances will produce radiographs of objects in the dark by the emission of the so-called Becquerel rays. These substances do not act by virtue of direct chemical action on the plate, but by invisible radiations which penetrate the great majority of substances.

The theory of the action of these substances is to carry along the light impression which the plate has already received to such a state that a satisfactory positive can be obtained. The action is, of course, much more gradual than in the case of the production of positives from negatives upon which light is allowed to fall during the process of development.

The researches of Abney have shown that the reversal of a negative is connected with the oxidation of the image. The treatment of the plate subsequent to exposure to the influence of oxidising solutions, such as potassium permanganate and potassium bichromate, serves to reduce the time of exposure somewhat.

A variation of the above oxidising treatment is to subject the plate to the emanations from fresh surfaces of zinc, magnesium, and other metals. These emanations will also produce photographs of objects in the dark. This action has been found recently by Russell to be due to the formation of hydrogen peroxide. Consequently it is much more convenient to employ weak solutions of hydrogen peroxide in water to produce the same effects. The experiments in this direction are not entirely completed, but the results will be communicated in the near future.

Through the courtesy of Dr. S. P. Langley, Secretary of the Smithsonian Institution, I am enabled to show two slides which were taken during the eclipse of last May, according to the ordinary methods, but with an instrument of extraordinary size. The lens was twelve inches in diameter, having a focal length of one hundred and thirty-five feet. This gave an image of the sun at the focal plane, of fifteen inches in diameter. The telescope was mounted horizontally and the light from the corona was reflected into it by means of an instrument called a Siderostat, the function of which is to counteract the motion due to the rotation of the earth, thus keeping the image stationary on the plate during the exposure of sixteen seconds. One of these photographs shows the polar streamers very distinctly, although the inner corona is over-exposed. The other photograph shows the large prominences, extending many thousands of miles beyond the main body of the sun.

The lantern slides which are now shown, are direct positives made without the usual intervening negatives, by contact printing, as well as direct outdoor exposures. The development was made both in sunlight and by the light of a Welsbach burner. The reversal of the image does not leave the film perfectly transparent, which is specially noticed in pictures having a good amount of sky in them.

In the process of the reversal from the negative to the positive, absolute chemical equilibrium does not seem to be established and there results the slight veiling of the film noticeable only in the high lights, which, however, does not affect the most minute details of the picture. When the electric lantern is used, this slight veiling is not noticed.

The subject of positive photography is highly interesting from a scientific standpoint; whether it will make any changes in ordinary photographic practice remains to be seen. There is a possibility that it may prove the practical method for photographing the corona in full sunlight. The photographing of the stars in full sunlight, is another very interesting possibility. HOWARD W. DUBOIS.

* This paper was read in March last.—EDS. *B. J. P.*

AN AMYL-ACETATE LAMP FOR SENSITOMETRY.

[Translated from the "Archiv für Wissenschaftliche Photographie."]

FOR exact experiments with photographic films I have used for the last two years an amyl-acetate lamp that was originally constructed for benzine. I have already described this lamp in the "Archiv für Wissenschaftliche Photographie" (ii., pages 131 and 179, 1900). Although the lamp burnt well, and the intensity of the light did not fluctuate, I found it desirable to reconstruct it completely. From the communications of Eder and Precht, and the discussion which followed, there is no doubt that the Hefner and the Scheiner lamps yield light differing in composition when examined with the spectroscope, and that amyl acetate cannot be burnt in the Scheiner lamp. Eder at least admits that the composition of both sources of light are so much alike that the Scheiner lamp may be used for all practical purposes, but that for all exact work the Hefner lamp must be employed. However, for sensitometry, the Hefner lamp has the disadvantage of too great intensity, and this has caused me to abandon my old benzine lamp. At my request Mr. Georg Schurr, mechanician of the Physical Institute of Tübingen University, has constructed a lamp for me which has the outward appearance of the Hefner lamp provided with a simple gauge. I have given up the ring with which

the Scheiner apparatus is provided, and use instead two metal plates on either side of the flame to measure its height. The old Hefner lamp had a similar gauge, but it was abandoned because the metal plates affected the height of the flame, but such is not the case with the new lamp: firstly, because the flame is very much smaller than that of the Hefner lamp; and secondly, because the distance at which the metal plates are placed is such that the flame may freely burn without interference. The height of the flame is fixed in such a manner that the Hefner lamp and the amyl lamp exactly agree in their spectral composition. It follows, therefore, that for all purposes both lamps may be compared by reduction, and the new lamp may be advantageously employed instead of the Hefner for experiments in sensitometry, especially where space is limited. Its much lower price may also be a consideration. The lamp has been thoroughly tested for the height of flame specified, and under such conditions burns faultlessly.

As in the case of the Scheiner lamp, the use of a chimney is not advantageous. The flame varies and the aperture in the chimney has the further disadvantage that the intensity of the light cannot always be calculated directly, by the well-known law, according to the distance of the lamp. The size of the aperture projected upon the flame, measured from the distance of the object, must be taken into account.

The absence of a chimney, however, makes it necessary that the walls of the room should be painted black, but in most cases a sheet of black paper bent to enclose three-quarters of a circle will suffice. The diameter of this cylinder should at least be 15 c.m., and it is desirable to notch the lower edge, or cut some holes in it, so that the supply of air may not be impeded.

SPECIFICATION OF THE LAMP.

Diameter of the Amyl-acetate receiver	60 m.m.
Height	36 „
Contents	18 c.c.
Height of lamp to end of wick-tube.....	68 „
Wick	63 m.m.
Height of flame from end of wick-tube to bright tip of flame (the edge of low intensity is not included in the measurement of the flame of Hefner's standard lamp)	19 „
Intensity of light.....	0·32 Hefner.

Mr. G. Schurr, of Tübingen, supplies the lamps.

DR. E. ENGLISCH.

THE HAND CAMERA AND ITS CAPABILITIES.

[A Paper read before the Edinburgh Photographic Society.]

I.

THERE is nothing more interesting in connexion with modern photographic appliances and methods of working than the manner in which the hand camera has pushed its way to the front, and proved itself to be one of the most valuable, because one of the most powerful, instruments which science has placed in the hands of the careful worker.

POPULARITY OF THE HAND CAMERA.

The popularity of the hand camera is made evident to us on every side; photography is practised by thousands who before the advent of the little black box took no more than a passing interest in the art, and it almost looks as if the holiday-maker of the near future will be as likely to forget his railway ticket as his films or plates.

The hand camera is so easily carried, so very compact, and has the reputation of being so easily worked with a certain degree of success, that they who wish to take photographs but dislike learning photography, find in the instrument a ready means of gratifying their desire.

Again, there are many people who are really attracted towards photography by the fascination of the whole process, and take to the hand camera as a first step—it ought to be the last—because of the portability and small bulk of the apparatus. Now, he who is desirous of learning photography thoroughly can make no greater mistake than to go in for a hand camera at the start. This has been preached by experienced workers again and again, but still we hear that the instrument is so easy to work, it only requires the turning of a few screws and the picture is taken. Well, perhaps it is, but possibly it is not. Then we hear about So-and-So, who knew nothing about photography, yet has turned out splendid work with a hand camera. This, of course, only shows that the good work was turned out by chance. Probably the successful turner of screws and presser of knobs had been told by the dealer who sold the camera that he must work only in bright sunshine, that he must use a certain stop and a particular plate, and let off the shutter at such-and-such a speed, and being wise in his day and generation, he followed the instructions and scored a success. But wait; by-and-by our friend gets tired of this, he wants to try another maker's plates, and would like to take a picture later in the day; or a friend has told him that his shutter is too slow for trains going at express speed, and that sharper pictures will result if a smaller stop be used. The tyro tries a few of these things, probably tries all of them, tries all the combinations his instrument is capable of, and then discovers he will have to learn photography or be content to work like a machine. There are many workers who know that by following certain lines good results may be obtained, but do not know why. If photography is to be learned earnestly and thoroughly, it must be by means of the stand camera. The hand camera is capable of turning out the very highest class of work with certainty in the hands only of the expert photographer. For most hand-camera work the instrument must be manipulated at very short notice. The point of view for the picture, the size of stop to be used, the distance for which the focus must be set, the speed at which the shutter should be worked, must all be gone over in the mind and settled instantly; and it is only the experienced worker who is able to decide all these points quickly, and act with certainty. The beginner may argue that time may be taken and each point carefully considered before exposure is made, but then the greatest value of the hand camera would be lost, for if the instrument cannot be used at once, at a moment's notice, it might as well be mounted on a stand, when slow plates and a careful calculation, which would be more conducive to success, could be employed.

There are many, however, who have no desire to go deeply into the mysteries of photography, and have no particular wish to produce work of high pictorial merit; they are satisfied if the camera supplies a representation of some place or event in which they feel interested. The hand camera is used to an enormous extent by the tourist who desires to carry away with him some record of places visited or incidents witnessed, and by the worker who finds his chief pleasure in taking what he calls "snap-shots." You know the sort of work alluded to; the photograph of a steamer; a railway train in motion; a street scene; a group of friends; just the sort of work the hand camera is so well suited to, and which has the greatest fascination for so many workers because most of the objects are in motion. It is rather curious, yet most of us have felt, at any rate when beginning, that there is a peculiar attraction about taking objects in motion. We feel we are able to arrest the movement, as it were, and we long to exercise our power. It is the same spirit that impels workers to take photographs from the deck of a moving steamer, or from a quickly travelling railway carriage. The subjects are probably not nearly so good as hundreds that might be had any day during a short ramble, but they have a peculiar interest in that they have been taken from a moving platform.

IN THE HANDS OF NOVICES—CHANCE WORK.

The hand camera, then, is used to a very great extent by inexperienced workers, with the natural result that there are floating about a tremendous number of bad or indifferent photographs. In consequence of this, the instrument has come to be looked upon by many people as a sort of toy; that the instrument is capable of serious work is never for a moment dreamt of. The remark may often be heard, "It's only a snap-shot;" or, "It's not bad for a snap-shot." Errors arising from an unevenly held camera, wrong exposure, bad composition, careless printing, are all pardoned: "It's only a snap-shot, what else can you expect?" "Just think of the fun it must be to take such things as these," our friends say; "we must get one of these cameras next summer, and we'll ask Mr. Take-em-all if we can take snap-shots in the drawing-room."

It is not intended here to deprecate the use of the hand camera as a means of recording hard facts or as a pastime when one is on holiday. I sometimes think that experienced workers are apt to condemn too severely the employment of the instrument for what we may call work of a lighter sort. As has already been pointed out, the adoption of the hand camera by the novice who means to take photography seriously must be strongly protested against, but I do not expect that every person would wish to take up the art as a means of serious picture-making or of scientific research. I feel that the instrument has taken a valuable place in supplying a pleasant and harmless recreation. If using the camera as has been indicated has given pleasure and furnished what was desired, then we should rest satisfied, but I should like to point out that the little box is capable of really serious work; indeed, it may be fairly said that the hand camera is the finest instrument for pictorial work that modern photography has at its command.

One of the peculiar advantages of photography over other means of pictorial representation lies in the fact that a picture which chance or

accident has thrown in the worker's way may be secured in a space of time which would be altogether useless for any other method. There is undoubtedly a great deal of chance work in the practice of our art; this is one of the most attractive features of photography. The worker knows that at any moment an opportunity of securing something uncommon in the way of a picture may present itself, and he is conscious of the possession of the power whereby he can take advantage of the occasion. It is this power which makes hand camera work so interesting; the instrument can be used so readily and so effectively at the shortest notice. The photographer may go out with the idea of securing a certain picture, and return with something entirely different, simply because the latter was thrown in his way, and he was able by means of the little camera to seize the chance at once.

Although there is this element of uncertainty in photography, though some of the finest pictures are those which are secured by chance, it must not be deduced that the best plan to follow in general practice would be to go for an outing with the camera and trust to luck for the subjects. To do this is an extremely pleasant method of taking a holiday, but there is no doubt that the worker who goes out with some definite end in view, with the idea for a picture and the desire to follow out that idea, keeps his energies ever on the alert, and in this way becomes far more capable of seizing a picture which he happens to stumble upon. In the hand camera the artist photographer at once finds the means of recording a scene with which he is impressed, but he can only do so if he has become a thorough master of the technical side of his art. It is only the worker who thoroughly understands practical photography and has worked the instrument on the tripod carefully and methodically, who is really qualified to take full advantage of the capabilities of the hand camera.

As a Companion to the Tourist.

It is not always that the photographer is accompanied by the camera while on his rambles into the country. The reason may be that the spot to be visited does not seem to offer anything worth exposing a plate upon, or the worker may not feel in a mood for photography just at the time. We may feel quite certain that on the occasion on which the camera has been laid aside the photographer will come across the finest subjects to be wished for; indeed the absence of the means of representation will serve to magnify in his eyes the pictorial qualities of each scene to a very great extent. It is all very well to make a note of the place, point of view, &c., with the object of photographing the scene on some future occasion, but the charm of the subject at the time it was seen may be such as would be altogether beyond the power of the camerist to secure at a future time. Perhaps the atmospheric conditions were just exactly suited to show all that was desirable in a scene, and hid all that would be objectionable; a slight haze might be just what was wanted to do this, and such a condition of atmosphere might have prevailed when the subject was first viewed.

Again, perhaps the particular cloud-form was just what was required to harmonise with the landscape, or the angle at which the light was falling showed some features in the scene which appealed strongly to the spectator. Any of these points might be the cause of the particular charm of a scene at the moment it was viewed, but as the subject was probably never before observed by the photographer, it is quite likely that what the scene owed of its attractiveness to present conditions would be unrecognised; the worker would be pleased with the scene without being able to point out the causes which had brought about its beauty. On a second visit, however, the photographer would be almost sure to be able to tell why he did not like the scene, he would then become conscious of the one or more elements of the picture which had disappeared. A valuable lesson perhaps, but the camerist will not be able to forgive himself for leaving his instrument at home on the first occasion. How different a scene may look under changed aspects! In our wanderings we may cover the same ground again and again, and yet find something different each time. It is not only that the scene is altered at the different seasons, that is apparent to every one, but it is quite possible to obtain representations of the same place within a day or two, sometimes indeed within an hour or two of each other, which would be altogether different pictures. We may go to a spot in the early part of a day when everything is bright and sparkling, and the sky is full of light clouds, and bring away an impression of the scene; but let us go again in the evening when the brilliant light is gone, when little detail is seen in the shadows and the sky has quite a changed character, and a picture altogether different may be obtained. There are many scenes which at one time of the day are extremely commonplace, and at another hour, owing to the different massing of light and shade, may be very beautiful. Considerations such as these speak very strongly of the advisability of carrying the camera with us when in search of the pictorial, and the hand camera, always prepared for action and of little bulk, will readily be conceded to be the most desirable. We may come across so many subjects that are well within the scope of the instrument; it may be a roadside cottage, a nicely arranged group of trees, an interesting sky, workers in the field, or perhaps a fine piece of architecture or building of interest that may claim attention. A well-composed group of animals may be met with, and here we have the sort of thing that must be secured instantly, and which will be lost by a little hesitation on the part of the worker. Just come upon a well-arranged group of cattle and see how much time may be put off. If these animals be not secured at once, before they have time to decide that it is their duty to go into the worst possible positions, then a long wait is in store for the photographer. With a hand camera one can move round a group of animals and secure half-a-dozen different views in a few minutes. Out-of-door figure subjects lend themselves to most successful treatment by the little camera. In view of the extremely rapid plates and lenses now to be had, perhaps this branch of work should receive more attention than it does.

Seascape Work with the Hand Camera.

Of all the branches of photography to which we may turn, perhaps there is none so fascinating as seascape work. There is nothing more delightful than to ramble along a picturesque bit of beach on a day when there are plenty of clouds in the sky and a smart breeze is blowing; for on a day like this there will be observed an infinite variety of cloud-forms, and the play of light and shadow on the water will be a never-ending source of pleasure. The camerist might take up a position on a day like this, and secure a whole series of pictures from the same place, yet no two need be alike; a different arrangement of waves in the foreground and a changed sky would give a fresh picture for each exposure. It is a most interesting study, and one which I have frequently enjoyed, to select a suitable group of rocks, &c., near the shore, and, taking these as the groundwork of the picture, photograph the scene under different aspects from time to time. Many aspects under which such a scene might be taken will readily suggest themselves; morning and evening, storm and calm, under light fleecy clouds, or under the blackness of an approaching storm, when the tide is ebbing or flowing. Under all these conditions might the scene be represented, and such a study would well repay the trouble taken. Some particularly pleasing effects may be secured by representations of the sand as it is left by the tide; an arrangement of only a few stones and a stretch of sand will, under a suitable sky, supply all that is wanted to make a successful picture. For this class of work the hand camera is eminently suited. Sometimes, indeed, when the weather is very stormy, it is impossible to use any other form of instrument.

In order to secure the very best results when photographing constantly changing scenes like sea and sky studies, we must be ready to act at a moment's notice; if we are not able to seize the fleeting gleam of light on the water or the burst of brightness through the clouds at once then we are not working to the best advantage.

Seascape subjects lend themselves most admirably to successful treatment by photography, on account of the fact that their prevailing tone is more or less grey. There are no vivid colours to trouble us; no dark greens with deep shadows to contrast with the sky, as we have in landscape work, and no yellows and reds to speak of, unless, of course, we happen to be working in the early morning or in the evening. There will thus be no necessity for isochromatic plates, as those of ordinary make will render the tone values pretty correctly. It sometimes does happen, however, that the employment of colour sensitive plates is a distinct advantage. For instance, when it is desired to photograph light clouds against a blue sky, an isochromatic plate used in conjunction with a light yellow screen will be found to give a much better result than the ordinary plate. In seascape work it is quite an easy matter to employ isochromatic plates, even of a slow make, together with a pale yellow screen, for hand camera work. The photography of sky and sea is particularly well adapted to this class of work, because the use of slow plates is permissible—indeed, during the bright part of the day, almost necessary—if the best results are desired. With the employment of slow plates comes ease of development, and consequently increased chances of success. Over-exposure is a frequent cause of failure in seascape work, but the use of slow plates will reduce the danger, and render the task of overcoming the results of too prolonged exposure—by subsequent manipulation of plate and chemicals—an easy matter, on account of the great latitude of exposure which plates of slow make allow. It does not follow that quite as successful pictures will be secured by the use of fast plates, stopping down the lens, and working the shutter at a very high speed; such a course is to be strongly deprecated on account of the cruelly hard and unnatural results obtained.

Practical Advice.

We may sometimes hear a remark such as "this got the 100th part of a second," or "that was given the 80th of a second." We might expect to find, in the photographs referred to, representations of quickly moving objects, but it is quite possible that a view of some peaceful scene, showing nothing that would necessitate an extremely short exposure, will be brought forward. Probably the subjects shown would have been infinitely better rendered had an exposure two or three times as long been given, besides the trouble of developing the plate would have been much less. The fact is, that for most hand-camera work, there is seldom any necessity for a shorter exposure than from a 15th

to a 30th of a second. So long as the worker is able to hold the camera steadily there need be little fear of too much appearance of blurring on moving objects, provided these are not moving directly across the field of view and near at hand. To show how long an exposure may be made with safety, so far as movement of the object photographed is concerned, I may say that a friend of mine who used to take many views in the streets of Edinburgh, made all his exposures by hand, simply removing the cap of the lens and replacing it very quickly, yet all his moving objects were rendered sharply enough. It will be understood that the camera was used on a support, and I daresay this worker was more expert at rapid exposing than most of us would be, but the time taken to remove the cap and replace it must have been considerably longer than most shutter exposures.

It may be that some of you who have hitherto been using the instrument on the tripod have in view the purchasing of a hand camera for the present summer. Until experience in this class of work has been gained, it would be well to arrange that the movements necessary to obtain a picture will be as few and simple as possible. To illustrate what is meant, if the camera be one with a focussing arrangement, it will be advisable to focus on some object at say 20 feet to 30 feet distance and stop down the lens to about *f*-11. With a tolerably good lens it will be found that everything at and beyond this distance will be in focus, and that the plate will be well covered. Now, as there will be no object in stopping down the lens any more than is necessary for sharp definition—a smaller stop would be rather a disadvantage than otherwise—and as the focus of the lens has been fixed, we have two factors less to consider in taking the photograph, and therefore more chance of success. The speed of the shutter should be adjustable, however, so that allowance may be made for variations of light. If this method be followed by those who have no very great experience in hand-camera work, a much larger percentage of satisfactory pictures will result. There is little doubt that the value of the hand camera as a means of securing fleeting effects is often considerably lessened by the anxiety of workers to make sure that the picture is quite in focus and the plate well covered by the lens.

When experience has been gained, and the photographer is able to decide without loss of time what stop he should use, and for what distance he must set the focus of the camera, and at what rate the shutter should be worked, then the instrument may be used to its full capabilities. The artistic worker will not long be content with the camera which will not allow him to do full justice to his work, and one of the points about which he will be most particular will be the size of the view-finder. Many hand cameras are fitted with finders which are altogether inadequate for precise work. Workers may be seen twisting themselves into all sorts of positions that they may be enabled to see the image properly on a most insignificant finder, and it is quite likely that, after all, development will show a view different from what was expected. What is required by the artistic worker is an instrument which will enable him to see the image easily. The image must be of such size that the composition of the subject to be photographed may be studied, and the camera may with advantage be constructed so that it will be possible to focus by actual observation exactly what it is desired should appear sharp in the picture; in fact, the instrument should allow the worker to see exactly what he is doing, and thus ensure the success of every exposure.

A camera of the twin lens or of the reflector pattern will answer these requirements, and besides making the production of good pictures a matter of more certainty, will add to the comfort of the photographer in no small degree.

There is no doubt that the hand camera, in conjunction with the extremely rapid modern plates, and fitted with lenses working at very wide apertures, has been able to overtake a class of work which not so very long ago would have been considered beyond the instrument's power.

I feel that the little camera is destined to occupy an even more important position than it at present holds as a means of turning out work of the highest artistic and technical excellence.

J. B. Johnston.

A MECHANICAL SILHOUETTE SLIDE.

There are many hundreds of mechanical lantern slides now in use, of every sort and description; but this fact does not deter me from bringing before the notice of my readers another mechanical slide—one of my own invention—which, being original and effective, will, I feel sure, be of some interest to them. I have always found in actual practice that the slides depicting some of the commoner every-day occurrences and scenes "take" better than those representing more complex, less-known incidents.

Accordingly, the subject of the slide I now intend describing will be found to be well known, and, in some respects, simple, but those lanternists who trouble to construct the slide themselves from the details I shall give will assuredly find its effectiveness when exhibited upon the screen will repay them for their time and labour.

The slide represents a boy sitting upon a donkey's back. The boy tries to urge the donkey onwards, but it is stubborn—no unusual thing!—and will not do as its rider wishes it to. Instead, it does just the reverse, and, after several plungings and kickings, succeeds in throwing him over its head on to the ground.

For the construction of this slide three glasses are used, fitted into the ordinary wooden framework. It is hardly necessary for me to give details for the construction of this framework. It would be needlessly taking up valuable space; and a reference to one of his own mechanical slides will show every lanternist who wishes to construct the present slide how to make the necessary framework.

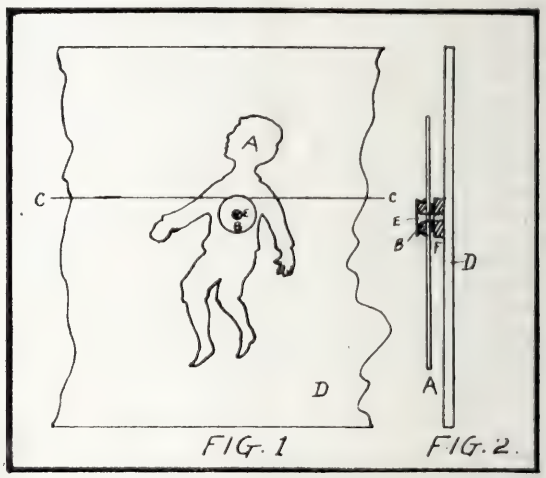
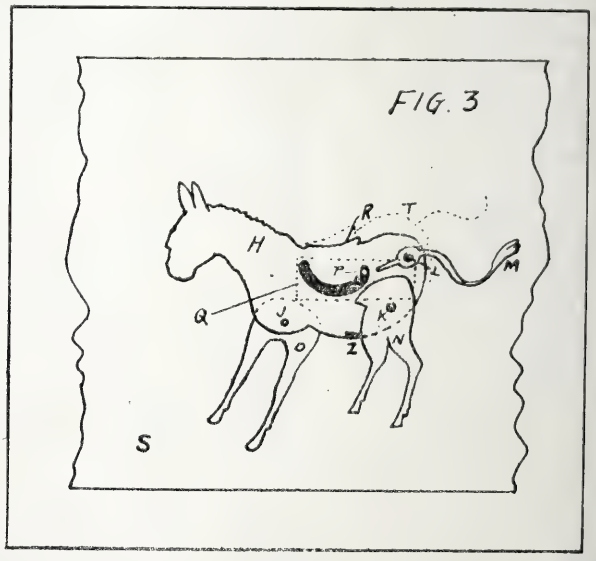


FIG. 1 FIG. 2.

The two outside glasses are fixed and the centre one is movable in a groove provided for it in the framework. They are all shown in fig. 4.

The working parts of the boy are fitted up on one side of the centre movable glass and the working parts of the donkey are fitted up on the interior surface of the fixed glass furthest away from the boy.

Referring to fig. 1 the boy, A, is made of thin metal in one piece, as shown. To his body is glued a small grooved wheel, B. He is then pivoted to a small block, F (fig. 2), glued to the surface of the centre glass, D, by means of the screw, E.



A thread, C C (fig. 1), is then passed round the grooved wheel, B, and the ends are fastened to two blocks, one at each end of the fixed glass which is nearest the boy. It will thus be seen that if the centre sliding glass is pushed along its groove the boy will be caused to revolve or turn "head over heels" by means of the stationary thread passing round the wheel glued to his body. At the same time, because he is attached to the sliding glass by means of the block, F (fig. 2), he will be carried on with the glass.

The method of fitting up the donkey will now be dealt with. As before stated, it is fitted up on the fixed glass farthest away from the boy. In order to fully explain the relation of the donkey and boy let reference be made to fig 4. Then, if the boy is attached to the left-hand side of the centre glass, B^3, the donkey will be fitted up on the interior surface of the fixed glass, C^3. The blocks bearing the thread which causes the revolution of the boy would, of course, be glued to the extreme ends of the fixed glass, A^1.

In fig. 3, S corresponds to the fixed glass, C^3, in fig. 4. We will now refer to fig. 3 more definitely, in order to show the method of fitting up the donkey.

The two front legs, O, are cut out of one piece of thin wood, and glued to the fixed glass, S. The head and body, H, are cut out of a piece of thin metal and pivoted to the front legs by the stationary pivot, J. It will be noticed that the donkey's back is so cut as to leave a slightly projecting piece, R, which serves as a saddle. It goes without saying, of course, that the donkey is so fitted up that the boy will appear to be really sitting on its back.

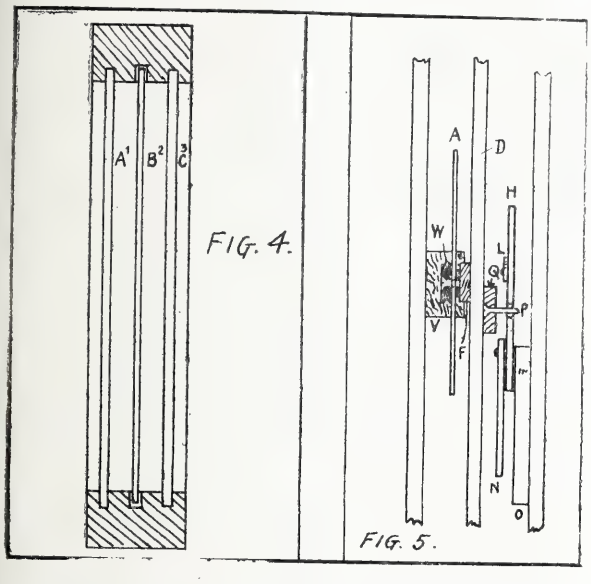


FIG. 4.

FIG. 5.

In the donkey's body will be noticed a semi-circular slot. Its use will be seen later. The legs, N, and tail, M, are pivoted to the body at the points L and K. In this diagram Z is a small projecting part of the donkey's body turned up at right angles to the body, and prevents the legs, N, from swinging too far forward.

Now, upon the surface of the centre sliding glass opposite that to which the boy is attached is glued a small block bearing a pin, P, which works in the semi-circular slot in the donkey's body. The dotted line, Q, in fig. 3 indicates the position of this block with reference to the donkey. The pin, P, is shown working in the slot.

Before the action of the slide is verbally explained, it may be as well to briefly state the purpose of each of the diagrams.

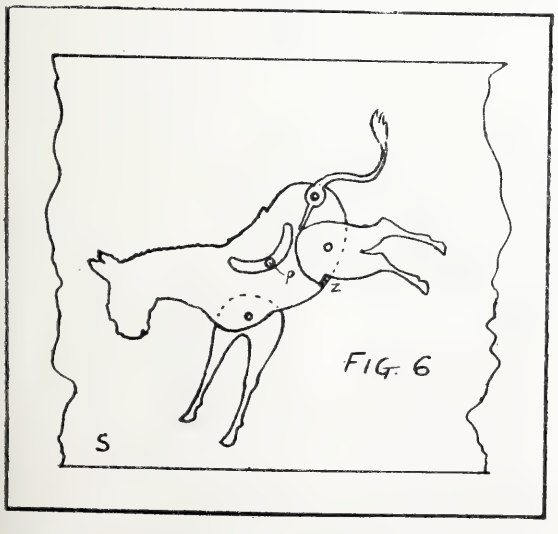


FIG. 6

Fig. 1, then, shows the boy with the wheel glued to his body, and thread passing round the wheel. Fig. 2 is a sectional diagram of the movable glass showing more clearly the manner in which the boy is attached to it by means of the small block, F. Fig. 3 shows all the working parts of the donkey, and the method in which they are fitted up. Fig. 4 represents a sectional view of the three glasses alone, with no parts attached to them. Fig. 5 is a sectional diagram of the three glasses showing the manner in which all the working parts are fitted up, and their relation to one another. In this diagram it may be necessary to state that W represents the thread on which the boy revolves, and V is one of the blocks at the ends of the fixed glass to which are secured the ends of the thread. Fig. 6 shows the attitude the donkey takes up when the sliding glass is pushed in half-way.

We will now see what takes place when the centre movable glass is pushed in. Reference being made first to fig. 3, it will be seen that the pin, P, would slide along the semi-circular slot, and, in so far as the donkey is pivoted at J, cause it to throw up its hindquarters a little. The legs, N, and tail, M, would move up also. When the sliding glass is pushed half-way, or, in other words, when the pin, P, has slid half-way along the slot in the donkey's body, the donkey will have thrown up its hind legs to their fullest extent, and will have assumed the attitude shown in fig. 6. Then, as the sliding glass is pushed farther still the pin, P, will move right along the slot, and the donkey will "descend" again. If the sliding glass be now pulled back the donkey will repeat its "evolutions."

But at the same time as the donkey is kicking up its hind legs, the boy upon its back is, by reason of the fact that the sliding glass to which he is indirectly attached is being shifted, caused to partly "turn over" along the stationary thread. It thus appears as though he were being thrown off the donkey's back. When the sliding glass is pushed right in he will apparently completely leave the donkey's back—being thrown off over its head—and pass out of view just before touching the ground.

Before pushing it right in the operator would, of course, push the glass in a little way, and then draw it back again several times. The total effect thus obtained would be that of a donkey making several attempts to free itself of its rider by rearing up on its hind legs, and, at last, by a supreme effort, succeeding in accomplishing its purpose.

If the sliding glass be pulled back sharply the boy will re-seat himself upon the beast's back, ready to go through the performance again if necessary. Such a movement would, of course, be unnatural, but it is effected so suddenly that the audience could not detect this.

One word in conclusion. To hide the thread from view it can be made to coincide with the top rail of a fence painted on the fixed glass in black. It will thus escape observation. A circular mask may be added to complete the slide, which will be found in every way very effective.

THEODORE BROWN.

CARE AND STORAGE OF NEGATIVES.

UNLIKE the professional worker, it cannot be said that, as a rule, amateurs bestow much thought regarding the adoption of certain precautions against their negatives suffering serious deterioration after a few prints have been obtained from them, and in many instances negatives that in after years are likely to prove of value and interest are so carelessly stored away, that they are practically worthless just when they are required to fill up some link or fond remembrance of the time in which they were taken. Since gelatine has become supreme in negative work, there is little doubt that the practice of varnishing a plate has, with amateurs at least, been totally ignored, and it is perhaps not saying too much to aver that ninety per cent. of the amateur workers of the present day never varnished a negative in their lives. With them the operation is considered superfluous, doubtless on the score that, only one or two prints being required, there is no need to take the precautions found necessary, as in the case where a large and continuous number of prints are required from what may be termed commercial negatives. At no period of the year is the result of this carelessness more likely to show itself than at the present, for unvarnished negatives which have been used to throw off prints during the late autumn and winter, and which have been stored away in unsuitable places, on coming to be examined will, in nine cases out of ten, show serious damage by reason of "silver staining." These stains are the dread of all professional workers, and they know well how difficult it is to utilise any negative which has contracted such damage. Hence the care they bestow to guard in every possible way against their property becoming hopelessly ruined. Quite recently the writer of this article was waited upon by a gentleman who prided himself on his photographic ability. Three years ago he had made a journey round the world, the outcome of which was a series of highly interesting negatives. These in due course were printed in scrap form, and provided a pleasant souvenir of his tour in the shape of a neat album, and now his desire is to compile a series of lantern-slides from these negatives. Alas, however, on coming to overhaul them, he finds them, as he says, all over metallic spots and brown stains that make the production of transparencies from them a matter of impossibility. It is just the same old story of a highly valuable set of negatives being ruined by sheer carelessness, was the writer's reply, on being asked what he was to do to overcome the difficulty. Now, in this little episode of real life we have the thing in a nutshell. The negatives were unvarnished; they were printed on gelatino-chloride paper in the month of October; and they were stowed away in ordinary plate boxes in the porter's bedroom, where a fire was never lighted from one year's end to another, and in which the cupboard where the negatives were placed was built in the gable of the house. No doubt there are hundreds of amateur workers who can tell a similar story, and who even are not aware of the cause of

these stains attacking their negatives. Fortunately, however, on this matter there is no doubt, for, as is well known, they are contracted by damp, *i.e.*, either the gelatine film of the negative was not perfectly dried before it was placed in contact with the printing paper, or, it may be, on the other hand, that the printing paper was damp when placed on the surface of the negative. Every one knows how liable a gelatine film is to contract dampness even from the atmosphere, and not only is this the case in regard to negatives, it is equally so in the case of gelatino-chloride paper. Any novice who has misgivings as to the truth of this statement should just try the effect of placing first a negative that has been unvarnished and stored in a damp place before a fire. A few seconds will suffice to show the dampness present escaping in the shape of a light vapour; and if the same treatment be accorded to a sheet of ordinary gelatino-chloride printing paper the effect is quite apparent. The truth is, since the introduction of gelatine or emulsion printing papers, the liability to stain negatives in printing has been largely increased, and it follows that unless the utmost care and precautions be taken it is scarcely possible to manipulate the printing of gelatine negatives with such paper during the damp months of autumn, winter, and early spring without damaging them.

The application of a good sample of hard varnish is, no doubt, a useful precaution, for, if the silver stain should chance to put in an appearance, it would first attack and show its presence on the film of varnish before eating down into the gelatine film, and hence allows of the varnish being removed by means of a bath of methylated spirit, and with it the dreaded stain. A good preventive is also that of applying to the wet negative, *i.e.*, when it is finally washed, an application of water varnish, composed of borax, shellac, and water, the formula for which can easily be derived from the back numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY. It should, however, always be borne in mind that the varnishing of a film is only a precaution against the film contracting dampness from the atmosphere before and during the operation of printing, and, unless further precautions are taken to see that the printing paper, the backing of the printing frame, and the printing are not governed by conditions of dampness, even a varnished film will suffer unless the stain is detected in its early stages. It is surprising how soon this stain affects a damp negative. In forty-eight hours it will begin to show itself, possibly in the shape of a thin band of metallic lustre on the face of the gelatine, and lucky is the worker who, on discovering the mischief already done, is able to apply such a treatment to his negative as will save the same from utter ruin. Keen watchfulness is another precaution of the greatest import. On every occasion when printing has to be conducted in damp, unfavourable weather, necessitating the printing paper being in contact with a negative for an abnormal length of time, such negatives ought never to be placed away when printed, and treated as if in a proper condition for being stored as unwanted. They should be placed in what may be termed positions of observation, *i.e.*, where they can be examined for several days, and on no account should failure be made in scrutinising their surfaces at regular intervals, and the moment the first symptoms of the dreaded stain appear they should be treated straightaway to the only treatment known to the writer as really efficacious for their preservation. There is another very fruitful source whereby these stains are contracted. Every printer knows how, in the dark months of winter, the temptation is very great to take advantage of the slightest blink of sunshine to bring up some slow printing negative that may have been in the frame for days, and very likely never for a moment dreams that there would be any likelihood of damage arising from damp by placing a frame in sunlight. Yet the fact remains this is in reality a most dangerous act, for the sudden rise of temperature that accrues by bringing the frame suddenly into the sunlight draws whatever moisture the film and paper contains, and this being bottled up, or having no means of escape, may, in aggravated cases, go so far as even to form beads of moisture on the under surface of the negative, *i.e.*, the film side, and when this occurs the liability to ruin a negative is very great. Practically we see the same effect displayed when a lantern-slide is placed in an optical lantern in a damp condition. In this case the sudden rise of temperature caused by the heat passing through the condenser generates from the surface of the damp slide a vapour which settles down like steam on the cover glass of the slide, and lucky it is in lantern work that there is no staining agent present, or the lives of our lantern-slides would be of shorter duration than they are. Such treatment, however, never improves slides, and often seriously injures them when they are kept a long time in the lantern after having generated moisture in this manner. Did amateur workers only realise the importance of the operation of printing as a professional does when dealing with valuable negatives, they would never look so lightly upon printing as being a mere mechanical operation that can be entrusted to their boy, man, or domestic servants during their absence at business, or otherwise conducted in the slip-shod manner we see it performed at house windows in all sorts of weather. The truth is the printing-room is the most important sanctum of all well-appointed studios, and the head printer a personage by no means a cypher in such establishments.

An object-lesson in this matter can easily be provided by those desirous of becoming acquainted with the insidious manner in which these stains make appearance. To obtain this, let an unvarnished gelatine negative be stored away for a few days in a damp cupboard, at the same time placing a sheet of paper intended to be used in printing the same, in the same cupboard. In a few days' time let the printing be performed at, say, any ordinary window, and when printed the resulting prints will show no signs of damage, but most likely appear all that is desired. A few days afterwards, however, on coming to examine the negative, it will be found that some mysterious brown spots are here and there scattered over the surface of the negative. These brown spots on being examined by reflected light appear like metallic spots of silver, which, as days roll on, gradually become more and more pronounced, and get deeper and deeper embedded into the gelatine film. Of course, all negatives so attacked are practically unprintable, for no amount of spotting can get rid of the white patches containing no detail which results in printing them in this condition; and it is a patent fact that, among professionals even, there is an idea that such negatives are beyond restoration when in this condition. This, however, is a statement which goes too far. In many cases when the evil is detected at the outset a cure can be effected, although no doubt there are many aggravated cases as are beyond any treatment for their removal, such as would be the case where the stain has been of sufficiently long standing as to eat right through the gelatine film down to the glass. When the stain is only of short duration the writer has found that it is only the surface of the gelatine that has been damaged, and by taking the following prompt action these stains can be removed and the negative saved from utter destruction. It is fortunate that their removal does not entail any treatment liable to affect or injure the other parts of the negative which are unaffected, an opinion held, no doubt, by many who have attempted to remove silver stains by means of such agents as cyanide and iodide of potassium. True, these can be made to remove the stains, but at the same time they attack the silver as well to such an extent as to render the negative useless for future use.

For many years the writer has given these stains and their removal a good deal of consideration, and the result of this thought has led him to the following method of treatment, which, in one sense, is extremely simple, and has the advantage of employing no chemicals liable to injure those portions of the negative which are unaffected with stain. Whenever the stains are detected no time must be lost in subjecting them to the following treatment. First of all, let a clean cambric handkerchief be wetted with methylated spirit, and with this let the portions of the negative containing the metallic spots be rubbed until the spots have lost their lustrous appearance when examined by reflected light. If the negative now be examined by transmitted light it will show more or less dense brown stains underneath where these metallic spots were. These brown spots the writer believes to be composed of chloride of silver and some organic matter contained in the gelatine film, and the simplest way to get rid of them is to place the entire negative, first of all, in a bath of weak salt and water, and then afterwards in a strong and freshly made-up solution of hypo. Any one who for the first time applies such treatment to a case of this kind might come to the conclusion that the treatment was of no use, for, in some instances, it takes several hours before there are signs that the stains are affected. In other cases, but a few minutes are needed to bring only a partial removal. Patience is required, and after immersion in the hypo for an hour or two aggravated cases will be found to yield to the treatment without any loss of detail at those parts where the brown stains were located. This shows that such stains are on the surface of the film only during the early stages of attack. When it is seen that the stains are gradually becoming less in dimensions, for the hypo seems to attack them at their sides as well, patience will effect their entire removal. The negative is then rewashed, and if the worker is wise he will take better care in future to protect valuable negatives from injuries of this nature. Faulty storage has much to do with bringing about this trouble, and only the keenest watchfulness will enable the presence of these dreaded stains being detected, and a worker to get rid of them easily when they put in a first appearance.

T. N. ARMSTRONG.

A BALLOON Commission.—The value of the balloon in scientific investigations, as well as in warfare, is becoming more and more recognised every year. The Berlin correspondent of the "Standard" telegraphing one day last week, says that a permanent International Aeronautic Commission has been formed by prominent savants and officers. The President is M. Janssen, director of the observatory at Meudon. The Vice-Presidents are M. Morey and Colonel Vevard. The German members of the Commission include Dr. Hergesell, professor at the University of Strasbourg, Dr. Emden, lecturer at the University of Munich, who is Secretary of the Commission. England, America, Belgium, Italy, Austria, Russia, and Switzerland are also represented. The object of the Commission will be to promote both science and sport in regard to aeronautics. We should imagine from the names of the savants who are prominent members of the Commission that science will receive more attention than sport.



SIR WILLIAM J. HERSCHEL, Bart.

President Photographic Convention of the United Kingdom,
Oxford Meeting, 1901.

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[THE LANTERN RECORD]

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PHOTO-MICROGRAPHY AND THE DETECTION OF ARSENIC.

The late beer-poisoning epidemic has awakened a very general interest, and desire for more information as to the amount of injurious "doctoring" and adulteration which is being carried on in the manufacture of the necessaries of daily life. Unfortunately "faking" is by no means restricted to the working up of unsatisfactory negatives, and a little diligent investigation shows that "doctoring" and adulteration are well-nigh omnipresent; nor is arsenic the only poisonous or harmful agent employed, many of the preservatives used for milk, butter, meat, bottled and canned goods, &c., having a most harmful action on the coats of the stomach. So, although we have been up in arms against the brewers of late, they are by no means the only or the greatest sinners; indeed, there is often just as much, and sometimes more, deadly poison in a glass of mineral water (particularly the aerated lemonade), or London "sky-blue," as in the "heel-tap" which masquerades as beer, in some of the poorer districts of our cities.

Arsenic is largely employed in the production of colours used for tinting dress fabrics, cheap sweets, wall-papers, and many other articles of daily use; and the photo-micrographer, with a little care and patience, may easily test for himself a piece of material or paper for arsenic. The process is a comparatively simple one, and many interesting and instructive photo-micrographs will be obtained.

For applying the photo-micrographic tests to arsenical deposits, two or three standard microscopic slides must be prepared. To do this the following standard solution mnst be made up: Place an exactly weighed half-grain of powdered white arsenic in a flask, and pour on to it about 10 drops of strong hydrochloric acid; allow this to stand for a short time, then add 1500 grains of distilled water, and boil until the arsenic is quite dissolved. Let the solution cool, and then make up the bulk to 5000 grains. Ten grains of this standard solution will then be equal to ·001 grain of arsenic.

Using moderate heat, evaporate on to some glass slips, 10 grains and 20 grains respectively of the standard solution, which will give slides with a deposit of ·001 grain and ·002 grain of arsenic. A ring of gold size may then be turned, so as to enclose the whole of the deposit within its circle, and, when nearly dry, a cover-glass pressed firmly down upon it, with an even pressure, so as to secure the thin glass to the cement ring at all points. No balsam must be used, as it renders the crystals too transparent for photo-micrography.

From these slides made from the standard solution, photo-micrographs should be taken, a $\frac{1}{4}$-in., $\frac{1}{6}$-in., or $\frac{1}{8}$-in. objective being used; care being taken to make an accurate memorandum of the lens, length of camera bellows, and exact magnification employed in taking each photo-micrograph. That portion of the slide which shows the best distribution of the crystals should be selected for photographing. The light must not be too powerful, or a flat negative will result; a pale blue glass screen, placed in front of the source of illumination, will be found very useful in modifying the light, and helping to increase the contrasts.

As crystals of arsenious acid are very transparent, a comparatively short exposure will be required, the tendency when first attempting this interesting branch of photo-micrography being to over, rather than under-expose. A few trial exposures will soon put this defect right; while, until the exact length of exposure has been determined a somewhat restrained developer may, with advantage, be used. As the length of exposure will depend entirely upon the source and actinic power of the illuminant, the magnification, and the speed of the plate used, it is impossible to give any fixed rules; experience alone can lead to success. With a little practice, the photo-micrographer will also find that he can easily distinguish which are the ·002 grain and which the ·001 grain deposits of arsenic on the slides, the ·002 grain slides having larger and more numerous crystals than the ·001 grain slides; while, should the ·002 grain deposit be a fine one, the crystals will be found to make up by numbers what they lack in individual size.

Having obtained a set of standard photo-micrographs of the arsenic solution, material for testing may be collected.

We will suppose that it is a wall-paper that has fallen under suspicion, for many wall-papers still unfortunately contain an injurious amount of arsenic; indeed, few, if any, are absolutely free from it, for which reason they form very suitable material for testing. However, it must be borne in mind that a wall-paper containing half a grain of arsenic to the "piece" (a "piece" is twelve yards long and twenty-one inches wide) is considered quite harmless, and would have no injurious effect upon the inhabitants of rooms whose walls were adorned with it; moreover, this standard of half a grain of arsenic to the "piece," allows a very fair margin for accidental and unavoidable contamination during the manufacture of the paper.

If we take half a grain per "piece" as a safe limit, we shall get ·001 grain per sample of sixteen square inches, and this will be found a very convenient and suitable size for a sample. From the doubtful paper a sample including all the colours, or at any rate the particular colours suspected, measuring exactly sixteen square inches, must be cut. The sample is then cut up into small pieces, and placed in a test-tube; the tube is then half filled with dilute hydrochloric acid (one part acid to four parts of water), and suspended, by the aid of a retort stand, over the flame of a spirit lamp.

A piece of copper foil, $1 \times \frac{1}{2}$ inch, with a hole punched at one end, must be thoroughly cleaned with the aid of a piece of emery paper. A piece of fine platinum wire is then passed through the hole in the copper foil; and directly the contents of the tube begin to boil, the copper foil is lowered into it, and the flame of the spirit lamp moderated, so as to keep the material in the tube just on the

simmer. A careful note of the exact time should be made, as the copper foil is lowered into the hot dilute hydrochloric acid. If the sample should contain much arsenic, the copper foil will almost instantly be coated a dark steel or black tint. According to the amount of arsenic present, so the length of time required to darken the copper foil will vary from ten to fifteen seconds to thirty minutes, which is the extreme limit of time for boiling; if at the end of thirty minutes, the copper foil is not coated all over a dark steel or lamp-black colour, the sample may be considered as practically free from arsenic. Supposing, however, the copper foil has become coated all over, it is then washed in clean water, care being taken on no account to touch it with the fingers—suspending it by the platinum wire will be found the simplest method. It is then dried first between a couple of sheets of blotting-paper, from which it is transferred to a heated brass plate, where it should remain for a few moments to become thoroughly dry.

When quite dry, take up the copper foil with a small pair of forceps, and, with the aid of a pair of scissors, cut it up into small pieces. A small test-tube, 1¼ inches long, which has been dried by heating to redness in the flame of the spirit lamp, is suspended through a hole cut in the centre of a thin sheet of brass measuring 4 × 1½ inches, supported on the ring of a retort stand. The pieces of copper foil are then picked up with the forceps, transferred to the suspended test-tube, and a microscopic slide, previously heated and dried in the flame of the spirit lamp, is placed in position over the mouth of the test-tube. The spirit lamp is then placed on the retort stand, so that its flame will play on the test-tube and copper plate. In about three or four seconds a sublimate will make its appearance on the slide, and this must be carefully watched until it is seen to begin to shrink at the edges, forming a patch just the size of the mouth of the test-tube, when the spirit lamp must be removed, and the slide allowed to cool. Some of the crystals may form upon the sides of the tube, but, with a little practice and manipulation of the flame of the spirit lamp, they can be successfully driven off on to the slide.

When the slide has properly cooled, a ring of shellac cement or gold size should be painted round the edge of the deposit, and, when nearly dry, a cover-glass carefully lowered and pressed down upon it. The sublimate may then be examined and photographed, care being taken to use the same magnification, length of camera bellows, &c, as were employed in taking the photo-micrographs of the standard solution deposits.

On comparing the photo-micrographs of the standard deposits with those of the deposits obtained by the above analysis, there will be no difficulty in arriving at a very accurate determination of the amount of arsenical contamination.

In purchasing the copper foil and hydrochloric acid, care must be taken that only pure material is supplied, and some of the copper foil and acid should be boiled alone for an hour, at the end of which time, should the bright copper foil show the least trace of becoming coated, it is certain that either the acid or the copper foil is impure, and must be rejected as useless for analytical purposes.

F. Martin Duncan.

THE PHOTO-MICROGRAPHY OF TISSUES WITH SIMPLE APPARATUS.

[Reprinted from the "Journal of Applied Microscopy."]

The growing importance of photo-micrography has been greatly enhanced within a few years by improvements in the half-tone processes of reproducing prints—improvements which have now reached such a degree of perfection as to make the reproductions in many cases excel the originals, and this work, being done at a very trifling cost, places in the hands of every microscopist ideal facilities for illustrating the result of his labours to an extended audience, provided, of course, he is familiar with photo-micrography, and can make micrographs of his subjects.

The appliances for doing this have kept pace with the general progress in all microscopical manipulations and technique. With homogeneous apochromatics, projection oculars, substage condensers of high numerical apertures, and stands of marvellously perfect workmanship constructed especially for the purpose, and having every conceivable convenience, it would seem that the limit of optical possibilities had been reached. If to these we add the specially designed cameras, combining in one the suggestions of many workers, orthochromatic or "colour correct" plates, and the many new, clearly and very perfectly developing reagents, it would likewise seem that the photographic branch of the subject has kept pace with the optical. In artificial illuminants we are equally fortunate. The electric current is almost universally available, and arc lamps of great simplicity and steadiness are to be had at comparatively moderate cost. The new acetylene light, one of the most perfect of radiants for photo-micrography, is also available everywhere at no more expense than the old coal-oil flame. In short, to the man with a desire for photo-micrography and a full purse, the world's workshops are open for the supply of an unlimited amount of perfect apparatus for his purpose.

But to most students and the great mass of workers, these doors are closed. They simply have not the money to spare for such necessarily costly appliances, and doubtless many turn aside in despair at the impossibility of commanding their use. But they need not. It is quite possible to do most of the work they would need with appliances already in their possession or quite within their means.

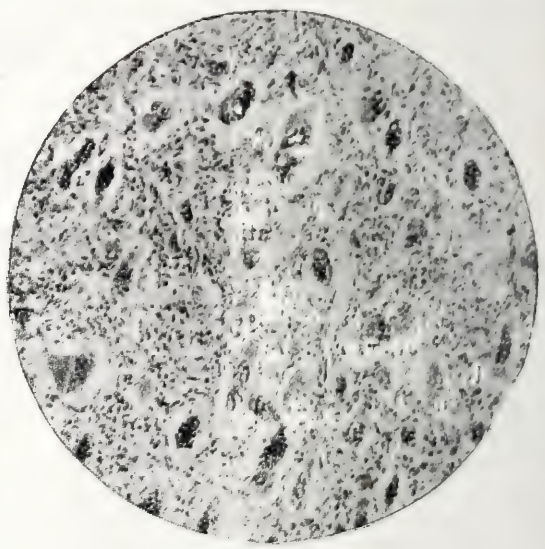


Fig. 1.—Giant Cell Sarcoma. ×100.

The so-called student's microscope, generally in use in our colleges and high schools, usually has an inclinable stand with two eyepieces, two objectives of about 1 or ⅔ inch and ¼ or ⅙ inch focus, and an Abbe condenser. With such an instrument it is quite possible to do most excellent photographing with amplifications ranging from about 50 to 600 diameters. Very little tissue work requires over 500, while most of it may be acceptably done at 100 to 200. All objectives of reputable makers are now so well corrected chromatically that there is little need to give the old bugaboo of focus difference consideration. Every student has such a microscope at his disposal, so we find the optical part of the question needs no further outlay.

You will probably ask, "What about the camera—this must make an extra cost?" Not at all. While very convenient and highly to be desired, good work can be done without a camera specially designed for the purpose. In fact, *any* camera provided with a focussing screen, and from which the lens may be removed, can be utilised in photo-micrography. A hand camera with these features is just as good for the purpose as any other form, though probably not so convenient. It merely requires to be firmly fastened to some support at such a height as to permit the tube of the microscope (when inclined to the horizontal position) to enter the lens opening and project the image of the object on the stage upon the focussing screen. The latter will be found too coarse for fine focussing, but the old device of attaching a disc of cover-glass to the ground slide

with Canada balsam will offer a perfect surface for delicate focussing. A sheet of plain glass may be substituted for the focussing screen, or the aerial image may be found by means of a hand lens. The illumination may be obtained by means of a coal-oil lamp standing at such a height as to bring the centre of its flame up to the optical axis of the microscope.

For many years I have been profoundly impressed with the importance of photo-micrography as an educational agent, which the successful introduction of the half-tone process of reproduction greatly intensified. At first the great cost of everything *necessary* for the work was no doubt a bar to its more general introduction, but happily this no longer exists. Quite recently one of a type of student's microscopes generally adopted by our best institutions of learning fell into my hands. It was a revelation to me of the wonderful progress made in the mechanism and optics of the microscope, and made my own apparatus, only some two decades old, seem quite ancient in comparison. Yet some of the objectives of my outfit represented an outlay much more than the cost of this entire apparatus.

The microscope in question was fitted with two eye-pieces, $\frac{2}{3}$ and $\frac{1}{6}$ inch objectives, Abbe condenser and iris diaphragm; a plain working stand costing very little money but of admirable workmanship throughout.

My test of a microscope and objectives being their adaptability to photography, I proceeded to apply it to this outfit, but came a shade further than usual in discarding the use of my special camera, and making up, instead, an improvised affair, that any one can do for himself in a very few moments. A small quarter-plate camera was pressed into the service, secured to a block at just the proper height to bring its axis in line with that of the microscope. An old focussing cloth, wound around the tube of the microscope at its junction with the camera, made this light-tight. A coal-oil lamp with an inch flame adjustable to any height afforded the necessary illumination for most of the tests, though the far more actinic light of an acetylene flame was also used at times.

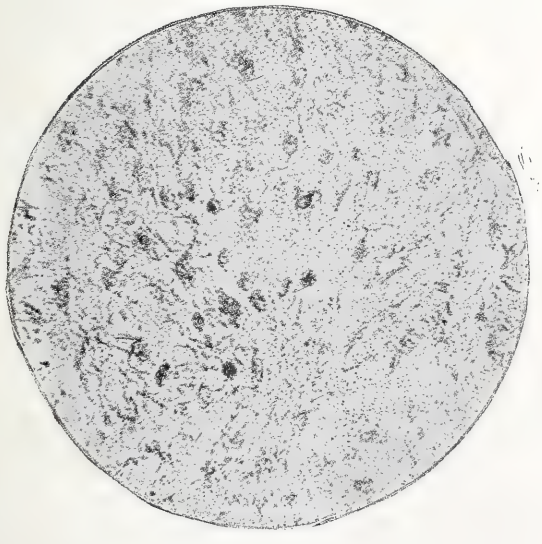


Fig. 2.—Myxomatous Tissue. ×250.

With this very simple apparatus, I made a number of negatives, most of tissues normal and diseased and varying in amplification from 100 to 500 diameters, the range of most useful enlargements in that class of work. While these might perhaps be exceeded in absolute perfection by the employment of the very highest attainable excellence in optical appliances, my conclusion is that they are good enough for all practical purposes, and quite within the means and ability of every student to make for himself in illustrating his own microscopical work. For this reason it is urged upon every one to make the attempt.

Among these negatives are two which may serve to illustrate the excellence of the optical work of this microscope. Both were made by the aid of the usual Huyghenian eyepieces furnished with the instrument, a form that we are told in the books is totally unsuited to the purpose. One was made with the Abbe condenser, a form which we are likewise told is useless in photography. But negatives and prints tell a different story. It is obviously impossible to give a detailed account of their working, within the limits of space at my disposal; but a synopsis may prove useful to many seeking information on the subject.

No. 1.

Giant cell sarcoma x 100.
Object, thin section, carmine stained.
Objective, $\frac{2}{3}$ inch, achromatic.
Ocular, ordinary Huyghenian $1\frac{1}{2}$ inch.
Condenser, none, flat side of flame used.
Light, Acetylene gas flame, 1 foot burner.
Plate, Seed's Non-halation.
Screen, green glass.
Exposure, 6 minutes (at least three times too short).
Developer, metol—quinol.

No. 2.

Myxomatous tissue x 250.
Object, very thick section, deeply stained.
Objective, $\frac{1}{6}$ inch achromatic.
Ocular, ordinary Huyghenian 2 inch.
Condenser, Abbe, iris diaphragm.
Light, Acetylene gas flame, 1 foot burner.
Plate, Wuestner's "Jersey Beauty."
Screen, cobalt blue (Rainig's Moderator).
Exposure, 90 seconds.
Developer, eikonogen-hydroquinone.

Prints on Velox Glossy Paper. W. H. Walmsley.

A SIMPLE AND INCLUSIVE METHOD OF TESTING PLATES.

[A Paper read before the Royal Photographic Society.]

I.

Probably every user of photographic plates has felt the need for a more direct methods of testing them than the mere observation of the results they give in their ordinary work. During the last few years, some makers have done a great deal for us with regard to general sensitiveness, indeed, there is rather a tendency to be hyper-critical in this matter, but so far as sensitiveness to different colours in concerned we still have to be satisfied with such vague descriptions as "isochromatic," "sensitive to yellow," "sensitive to red," and so on. With regard to the effective thickness of the film, if this is referred to it is in such terms as "thick films," and "richly coated," and, as in the case of worldly possessions, what is rich to one man may be very poor to another. Most makers advise a deep red light for use in the dark room whether it is necessary or not, and we are now getting accustomed to the advice to develop in absolute darkness, though no one has shown that such extreme precaution is necessary.

But even if makers gave an exact description of their plates, this would not obviate the necessity for testing on the part of the users of them. Plates when used are not always in the same condition as they were when issued from the factory. They may have been lying by for some months or years, and it may be a question whether they are still fit for use; and the properties of plates are not exactly definable in a useful way, so that tests performed in different factories would always be liable to vary.

The general methods of testing plates at present in vogue, if approximating to a useful exactness, require the use of cumbersome and costly apparatus and are tedious in their performance. If simple and rapid, they are generally uselessly uncertain and vague. Of course the exact methods of the expert will always remain the ultimate criteria, but for the vast majority of purposes such methods are very wasteful of energy and time, giving a refinement of accuracy that is rarely of use.

We want for testing plates a rapid and inexpensive method, and one that is easy to carry out. We want to know by a mere glance at

the result of the test the general characteristics of a plate, and to be able to get by further examination usefully quantitative indications. We want *one* operation to give us results that will show all the properties of the plate that affect our work: Comparative sensitiveness, as a whole, comparative sensitiveness to various colours, and therefore the kind of light that will be safe to use for their development, &c., the range of gradation, the effective thickness of film, fogging tendency, and other minor matters such as the character of the deposit in different densities. And if by the use of the same apparatus it is possible to value the effect of colour screens on the plates to be used, to adjust the screen to the plate where several screens are at hand, to adjust developers to get the most out of a plate as for instantaneous work, or to get great contrast and clear glass shadows as for copying black and white subjects, and in short to get all the information wanted in connexion with plates and their use, if this can be done with the same apparatus, so much the better. And it is desirable that the results of the tests of the qualities of the plates shall be of a permanent character, so that new batches may be compared with last year's, or even those of many years ago. This is a matter of especial importance to any who may ever seek to reproduce conditions that gave specific results in the past.

The use of a simple graduated screen will give many of the results wanted; but it tells us nothing about colour-sensitiveness. The Abney colour sensitometer is an ingeniously simple instrument for this purpose, and I therefore added to a graduated screen four colours, red, yellow, green, and blue, and a strip of uncoloured space, all adjusted to approximately equal luminosity. Now the combination of these two is worth a great deal more than just the two tests added together, although it requires only one exposure instead of two, because the graduated screen gives a quantitative character to the indications of the other. Using an Abney colour sensitometer alone, it is possible to under-expose and get no result under a yellow tint although the plate has considerable sensitiveness to yellow light; or with over-exposure, the effects under the colours may approximate to each other, although the sensitiveness to the various colours is really very different indeed. By comparing the densities produced under the different colours with the graduated series, their proportional values are indicated at once. In under-exposure a maximum limit to the special colour-sensitiveness can be set, and in over-exposure the large range of possible interpretations, and therefore, perhaps, their uselessness, is obvious at a glance.

But this combination is not sufficient. It is not possible to exactly locate the want of sensitiveness, or indeed often to discover it, by the use of mixed colours. I therefore made another set of colour patches dividing up the spectrum into distinct portions, and just those portions into which it is practically divided by the plates at present available. Ordinary plates are practically sensitive to the ultra-violet, violet, blue, and green up to about the Fraunhofer line *b* or E, so the first patch is a blue that transmits this light, cutting off the rest of the green, the yellow, and the red. Isochromatic plates have an added range of sensitiveness extending from about E to D. The next patch is therefore a green that transmits this light. With the usual range of exposures an "ordinary" plate will show an effect under the blue patch only, while isochromatic plates show effects under both the blue and green patches. Then follows a red patch that transmits light from D upwards, which distinguishes red sensitiveness. And a further red patch distinguishes between the red from D to C, and that less refrangible than C by transmitting only the light less refrangible than C. The arrangement is shown in fig. 1.

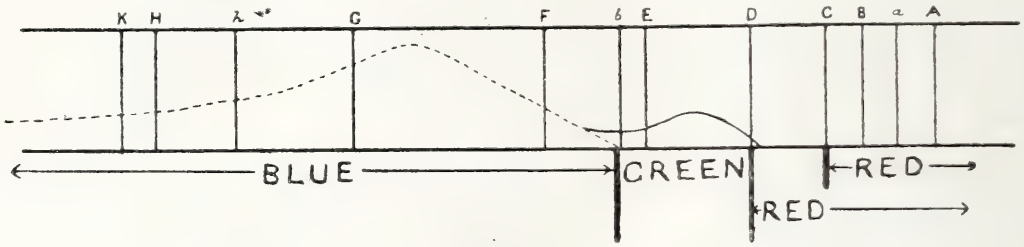


FIG. 1.

This series of definite colours, being on the same screen with the graduated tints, can also be treated quantitatively by comparing the densities given under each with the graduated tints, and there is exactly the same safeguard against over or under-exposure, as explained in connexion with the Abney colour sensitometer.

Such is the instrument that I first made. By its use, a single exposure and development gives a plate that shows literally at a glance whether the plate is an "ordinary" one, i.e., not specially sensitised, or isochromatic, i.e., sensitised to green and yellow, or of the nature of the spectrum plates, i.e., sensitive to red in addition; or also sensitive to the extreme red. The merest glance, if the exposure has been suitable, shows whether it is safe to use a yellow light for manipulating it in, or whether red is necessary, or, finally, whether only the least refrangible red is permissible. It shows at once, for example, that Cadett's spectrum plates may be manipulated in a light consisting of the least refrangible red, while Lumière's red and yellow sensitive plates are best worked in a feeble green light. Such information is a mere matter of a momentary inspection of the plate. If the exposure should have happened not to fall within the wide range generally available, this fact is at once obvious by comparing the densities under the coloured patches with the series of graduated tints, and the extent to which the exposure must be varied to secure a successful test is clearly shown.

By devoting a minute or two to the examination of two plates of different kinds, it is further possible to determine which is the more sensitive, and how much so, which has the greater proportion of sensitiveness to any particular colour, such as green, yellow, or red or, taking into account the relative general sensitiveness, which has the greater absolute sensitiveness to any such colour. Of course these determinations do not equal in accuracy the results that can be obtained by the expenditure of considerable time and the use of more elaborate experimental means, but for most purposes they are sufficient and, therefore, quite as useful. The further uses of the instrument in the adjustment of any of the conditions applicable to plates, such as developer formulæ, the selection of colour screens, and so on, will be referred to more in detail when discussing the methods of using the apparatus.

THE SCREEN.

The graduated tints in my original compound screen were cut out from the plate of an old Warnerke sensitometer. To make a thoroughly satisfactory instrument it was necessary to improve on this in many ways, particularly to keep the numbers small so that as large a portion of each tint as possible should be available for measurement. I showed my rough model to Mr. Sanger Shepherd, and from it and a few suggestions he has prepared the beautifully neat and, I think we may say, perfect instrument now available. It is, I think, perfect within the limits that must be acknowledged with reference to any such instrument. The series of graduated tints is better than any I have had previous experience with. The pigmented gelatine is cast in an accurately made gun-metal mould. The numbers are small and in the corners of the squares, leaving a large surface available for use. The range of exposures given is greater than in most graduating devices, extending to twenty-five tints, each alternate tint almost exactly halving the light transmitted. The range of exposures is therefore about from one to more than four thousand.

The four colour patches and neutral strip that constitute the Abney sensitometer are equalised in luminosity to daylight and not

candle-light. My first idea was to use candle-light entirely as it is always available, but Mr. Sanger Shepherd found that as there is only a small proportion of blue in candle-light, the discriminative power of a series of colours adjusted to it was so small that it was very much less useful than a series adjusted to daylight. And as colour screens are always (or practically always) used for daylight, it was better to discard the use of artificial illumination for this purpose. My original idea was to equalise the luminosity of *all* the colour patches, the four colours indicated in fig. 1 as well as the others, but Mr. Sanger Shepherd found that this would require a considerable reduction of the brightness of most of them and would therefore be inconvenient.

The inclusion of a half-tone negative, which gives results that may be more easily interpreted by some than the graduated tints, is due to Mr. Sanger Shepherd, and to him also is due the working out of the many details that are necessary before the embodiment of such an idea as my original instrument was, becomes transformed into an apparatus that can be made in quantities in a form suitable for general use. The compound screen is arranged as shown in fig. 2.

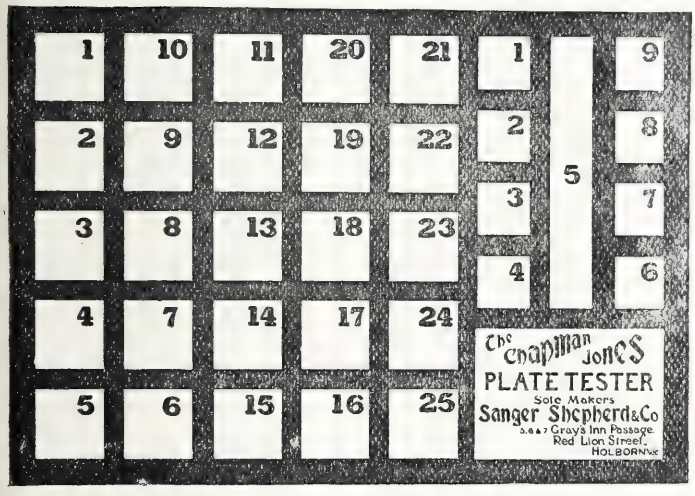


Fig. 2.

The squares numbered 1 to 25 form the graduated tints. Of the other squares, 1, 2, 3, and 4 are red, yellow, green, and blue respectively, 5 is the neutral grey, and these form the colour sensitometer on Abney's principle. The squares 6, 7, 8, and 9 are colours that represent definite regions in the spectrum, the least refrangible red, all the red, green, and blue respectively, as already described. A piece of a thin negative made from a plaster cast is superposed on the square containing the inscription.

The Light.

For the estimation of general sensitivenes a standard light becomes necessary. If there is such a thing as an absolute standard, it is not practically available. A simple instrument such as this is must have a simple and easily available light. A candle has the advantage of being easy to use, easy to carry about, and of being always ready, but it is not very constant. But for such purposes as the use of the compound screen, a difference of twenty-five per cent. is not of prime importance, being approximately half the difference between one square and the next of the graduated tints. It is not very easy to find the difference between two ordinary half-tone negatives taken under the same conditions when one has had fifty per cent. more exposure than the other, especially if they are developed separately. Moreover the aim of this apparatus is to be simple and inclusive, and not to compete with complex apparatus that finds a place in the scientific or the manufacturer's laboratory. This instrument is not intended to distinguish between two plates that are respectively, say, twenty or twenty-one times as sensitive as another, but rather whether they are one and a half, two, three, four, six, eight times, and so on, more sensitive. For this purpose a carefully selected candle, used intelligently, is quite good enough. But the apparatus is equally available for the use of any other light that may be preferred. It may be added that a constant light is only wanted for the determination of general sensitiveness, the sensitiveness to special colours being determined by means of the graduated tints, and being largely independent of exposure, as will be subsequently shown. A convenient stand has been devised to carry the candle and properly shield it from draughts, and to support the frame that carries the compound screen and the plate at a fixed distance, that is, one foot, from the light. This is shown in fig. 3.

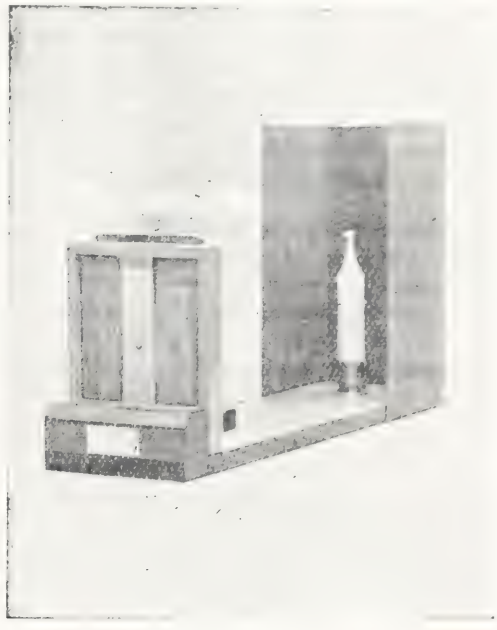


Fig. 3.

Estimating General Sensitiveness.

The method of estimating the comparative general sensitiveness of plates must be left to each worker. Some will compare the highest numbers shown. Others will say that the thinnest deposits are of no use, having no printing value. It may be useful to put the plates to be compared face downwards on rough paper as this obliterates the very thinnest squares.

It will doubtless be objected by some that this is practically a reversion to the old method of determining sensitiveness by the reading of a single density. If it were I should not be ashamed of it, for such a method is often just the method that is required. Moreover this method fell into disrepute chiefly, I believe, because of the very poor character of the Warnerke screens and because of the unsuitableness of the light employed. We have on this graduated screen a series of tints that will be found above suspicion. The candle is a more suitable light than the phosphorescent screen. And as a matter of fact, after trying a considerable variety of plates now on the market, I have not found any that do not give very good results by this method. I have found none that give that long drawn out series of feeble impressions with no practical differences between each and the next, that one sometimes used to meet with years ago. If such a plate was found, its faultiness would be at once obvious. An intelligent use of this method of testing will indicate the comparative rapidities of plates with a very useful degree of accuracy.

This method, with its modifications, is the simplest and doubtless will be that most generally adopted. It is comparable to the exposure of two plates in the camera for differing times until equally good results are obtained, and inferring sensitiveness from the exposures necessary, but superior to this method because (1) the light is more constant, and (2) if the two exposures do not give exactly the same results, the exact effect of altering either exposure is clearly obvious, *without another experiment*. If, for one example, the two plates give a similar range of gradation, but one is throughout two numbers lower than the other, this one with a doubled exposure would give a result equal to the other.

But if the Hurter & Driffield method of speed determination is

preferred, this apparatus is still available. Is is only necessary to measure the densities of the graduated squares, and plot the required part of the characteristic curve, as illustrated below. This, of course, involves the need for a suitable opacity measurer, as is always the case for this method of speed determination.

In the determination of general sensitiveness by any method whatever there is one point that obviously must receive attention, namely, the character of the light used, when the plates compared vary in their colour sensitiveness. This restriction applies to all methods when the light used for the test is not of exactly the same kind as that to be afterwards used in the work done with the plates. An isochromatic plate and an ordinary plate will have a different ratio of sensitiveness to different lights; the isochromatic may be more sensitive than the other to candlelight but less sensitive than the other to daylight. In this matter the present instrument possesses peculiar advantages, because a difference in colour sensitiveness is strikingly obvious by the results obtained on the same plates as the records from which the sensitiveness is deduced. I may repeat here what I have often said before, that a plate has not a sensitiveness or speed that can be expressed, unless the exact conditions to which the given speed refers are defined. Under altered conditions whether of light or development the comparative speeds of plates will vary, so that an exact determination of speed means nothing unless the exact conditions to which it applies are specified, and it will hold good only under those conditions. It is on this account that exact determinations are of no more use than approximate determinations for ordinary work of various kinds.

Character of the Gradation.

The relative values of the numbers of the graduated tints will be found to be as nearly as possible such that, taking *either* the even or the odd numbers, they form a series in which the next denser requires double the exposure to give the same result. This can easily be confirmed or the exact relationship found, by exposing two similar plates to a constant light for times proportional to, say, one to four or one to eight, developing both plates together and comparing the results. With the screen I have been working with, each time the exposure is doubled any given density goes up two numbers. The character of the gradation yielded by the plate, and the range of exposure that gives useful results can be judged of by an inspection of the deposits obtained through the graduating part of the screen. The difference between a long flat gradation and a short steep one is obvious at a glance. Those who are able to measure opacities, as by means of the opacity meter that I described a few years ago before this Society, can measure the densities obtained, or a selection of them, for example, each alternate square, and plot the results in the usual way, and so get the characteristic curve of the plate. And it is worthy of note that this curve can be obtained at any future time for any plate that has been tested in this apparatus. Every plate carries with it the record of gradation as long as the plate lasts. The apparatus gives a great range of exposures. To illustrate this and the drawing of the curve, I give in fig. 4 the results of the measurement of a plate sufficiently exposed to bring out all the numbers of the series. In this case every square is measured and plotted, the exposures ranging from one to over four thousand. The irregularities in the densest parts have been carefully

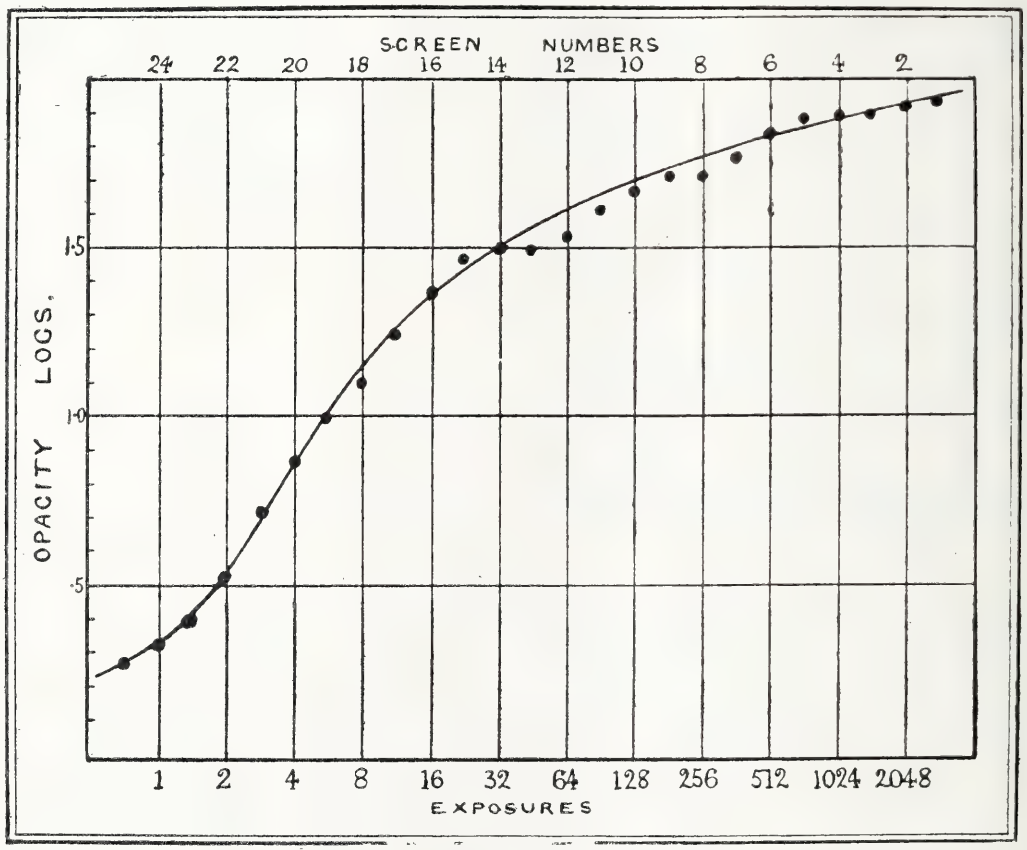


Fig. 4.

confirmed and are not due to errors of measurement. Nor are they due to errors in the instrument. There is a certain area near the middle of this plate that gives abnormally low densities, presumably because of the thinness of the film at that part, an effect that is well known. In this case, however, it is exaggerated because between the sensitive film and the glass there was a gelatine film stained a dark brown (an "anti-halation" plate), which practically absorbed all the light that penetrated the sensitive film. In ordinary plates, a thin place gets a little reinforcement by the reflection from the glass surface of some of the light that penetrates the film.

Chapman Jones.

PHOTOGRAPHERS AS DRAUGHTSMEN: THE CAMERA OBSCURA.

A correspondent writes: "I am under the impression that some years ago you mentioned in one of the Almanacs, which I must have lent to a friend, for I cannot lay my hands on it, that you made or got made a little machine for a friend who knew little about drawing, by which an image was thrown down on a bit of drawing-paper, and the gentleman in question was enabled to make very fair

drawings. I should be deeply grateful if you could tell me something of the nature of this sketching camera or whatever it is, for the above is exactly my case. I am often in Brittany, where are most picturesque subjects, and don't always take my camera. I am not a young man, but still very keen on matters of this kind. I may mention that owing to an accident my right eye is useless, so the peephole or otherwise should be arranged to look through with the left eye. I wonder whether a prism or something of the kind is provided for non-inversion of the image, which, I think, would be desirable, and of course portability and lightness would be considered. Can you help me? I take it this little affair could be screwed on to a camera-stand. What sized paper would you recommend? Pieces could be detached from an ordinary sketching-block I take it. Would paper about half-plate size do, or do you think this a little too big?—W. S. B."

We here reprint the article referred to, which may interest others besides our correspondent:—

It is on record that those past masters of our science—Daguerre and H. Fox Talbot—used to prowl around fine scenery, making sketches thereof by means of the camera obscura, the camera lucida, and, failing these, by the unaided pencil.

The camera obscura has many different forms, according to the purpose for which it is to be employed. Although the celebrated Baptista Porta has been said to have been its inventor, there is some reason for believing that it was known before his time. The photographic camera is, in a strict sense, a camera obscura (dark chamber), but not in the sense in which the term is now employed, which may be said to be the visual examination of external objects depicted on a white table as in life. Almost every reader will have seen the instrument on a large scale in popular observatories or at the seaside resorts. It here assumes the form of a large lens of long focus at the top of an erection to which no light is admitted save that which passes through the lens, the image thus formed being projected downwards upon a flatted white table, around which the spectators sit.

Those little finders with which so many hand-cameras are now fitted are also cameræ obscuræ, but are of no use as drawing cameras, any more than are the much larger ones of the fancy bazaars or toyshops. They all show nature as it is, in its forms, colours, and all; but everything is reversed as regards right and left, and consequently are useless for the purpose which we are now advocating, viz., projecting a scene on a flat tablet capable of being traced in outline by the pencil.

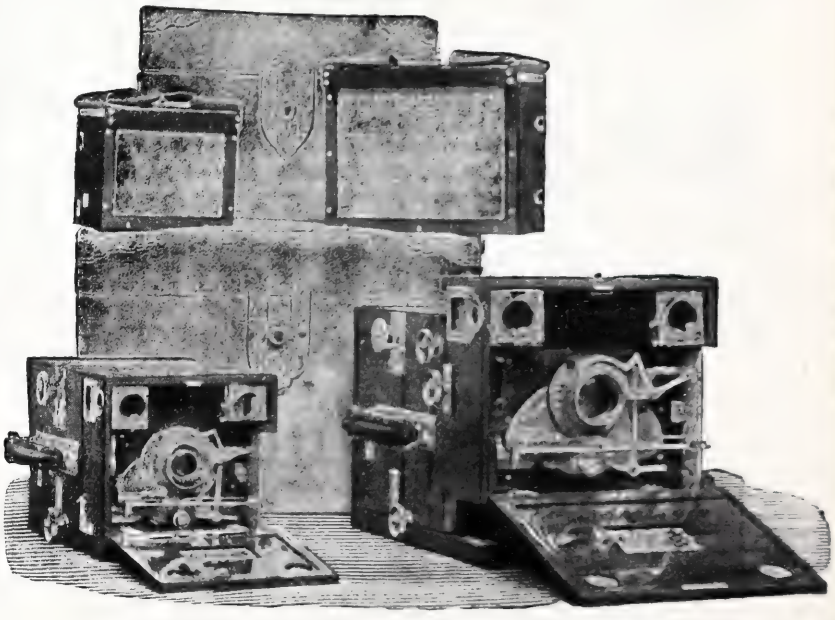
That artists do not—or, at any rate, *did* not in former times—disdain to make use of the drawing camera obscura is evinced by the numerous and ingenious portable contrivances brought into the field some years since, and, for all we know, may still be so; only I have an idea that photography has had an influence in revolutionising this.

A good portable instrument of this nature may be made to serve many useful ends in addition to giving a good "copy" for the budding artist who is learning to draw. But the first thing one should do is to acquire the art of interpreting nature when depicted on his tablet, with a few free-hand touches of a pencil, so as to leave no doubt as to which tree of a series is an oak, an ash, an elm, or a weeping willow. This is an art that can be readily acquired by the study of any of the numerous handbooks on drawing from nature, sold by artists' colourmen usually for a shilling.

A missionary friend was about to go to some place on the Zambesi, and was desirous of educating himself before starting as to the best means of enabling himself to send home views which should enable him to depict the scenes among which he should be located with a fair degree of accuracy. Photography was out of the question at that time, and he could not draw. The advice I gave savoured of what has just been written, and I designed for him a very portable camera obscura, which, when folded up, could easily be carried in his coat pocket, all but a stand on which it was to be erected. Its principle was this, and I commend it to photographers who wish to learn how to make pencil sketches without the aid of photography: A lens, of about fifteen inches focus, is mounted at the head of a pyramidally mounted opaque black cloth, erected on a stand, having at one side an aperture, through which is inserted the right hand with a pencil, on the base being spread out a sheet of paper, and in the ear of the cover cloth an aperture through which the face of the observer can be directed downwards, so as to see the image formed by the lens, outside of which is a small mirror, placed at an angle of forty-five degrees, so that external nature is thrown down and sharply focussed upon the paper below. It is not of vital consequence that the dark covering cloth be absolutely light-tight, as it would be were the operation a purely photographic one, for it requires a very considerable leakage of light to obliterate or render unduly dim the image formed by the lens, which, by the way, and for this purpose, need not necessarily be an achromatic one, worked with a small diaphragm. It may be here stated that, through the humble instrument described, the friend spoken of ultimately became a fairly expert draughtsman, even without its aid.

THE LAST WORD IN PHOTOGRAPHIC CAMERAS.

If one of the genii who figure so prominently in that delightful companion of our boyhood, "The Arabian Nights," could have had the opportunity of gratifying the wish of a favourite for the possession of the finest hand camera that money could produce, may we not imagine that he would have bestowed upon the fortunate recipient an Adams de Luxe camera of the kind that has been on view at 26, Charing Cross-road, London, this week? The Sultan of Morocco is shortly to claim the privilege of using two such instruments; one a quarter-plate, costing 2100*l.*, of which the whole of the metallic fittings are in gold, the other a half-plate costing 900*l.*, in which silver is employed. Some few details of the construction of these remarkable cameras will be of interest. The precious metals are hall-marked—the gold being eighteen carat—and are used throughout for the fittings of the instruments, exterior and interior, down to the screws; the sheaths, shutters, lens mounts, &c., being also ither gold or silver as the case may be.



Several months have been occupied in the production of the cameras, which carry Zeiss convertible anastigmat lenses, and it is superfluous to add that they are superbly finished. Something like ten pounds of pure gold have been used in the quarter-plate instrument, which weighs all told about thirteen pounds, and cannot be considered, in the special circumstances of the case, excessively heavy. The Adams de Luxe camera of 1901 is well known to most photographers, and it should be a double satisfaction to the Sultan of Morocco to feel that he is not only using the most expensively produced cameras in the world, but also those which, in point of practical value and amenability to the needs of the "serious" users of the hand-camera, are not excelled by any similar instruments that are in existence. We congratulate Messrs. Adams on their share in establishing a "record" which is hardly likely to be challenged, or, if challenged, to be beaten.

A MECHANICAL SILHOUETTE SLIDE.

The subject of the present original mechanical slide is two men engaged in sawing through a log of wood. As will be seen, the construction and action is very simple, but the effect obtained when the slide is exhibited upon a screen by means of the optical lantern is very natural and realistic.

For its construction two glasses are employed, fitted into the ordinary framework, too well known to need description. One of the glasses is fixed, and the other is movable in a groove provided for it in the framework. The parts comprising the two sawers are fitted

to the fixed glass. The saw is attached to the sliding glass, and the log of wood is painted on the fixed glass in dead black. We will now deal with the fitting up of each glass in greater detail.

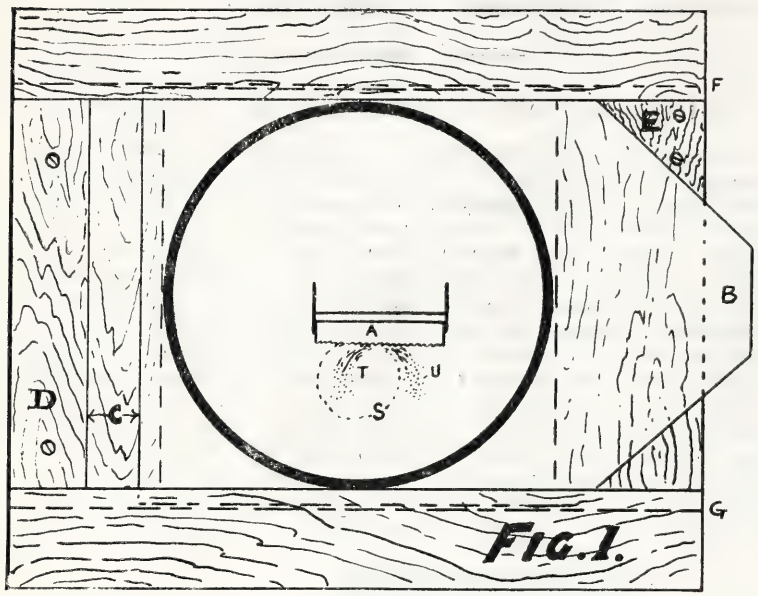


FIG. 1.

The legs of the two men, Q and R (fig. 2), are cut out of wood, and glued to the interior surface of the fixed glass in their proper positions. The bodies, M and N, are pivoted to the legs at the places indicated. To the bodies are pivoted the arms, O and P, of the two men (fig. 2). It will be noticed that the ends of the arms are bent round, and fit over the handles of the saw.

A block of wood, A (fig. 2), cut to the shape of a saw, is now glued in its proper position to the interior surface of the movable glass. The handles are formed by lengths of wire bent at right angles, one end of each forming the handle, and the other ends being thrust into the ends of the block forming the saw, as shown in fig. 2, by the dotted lines, H and I. A wire, L, is soldered to the top of the saw, in order to impart the proper finish to it.

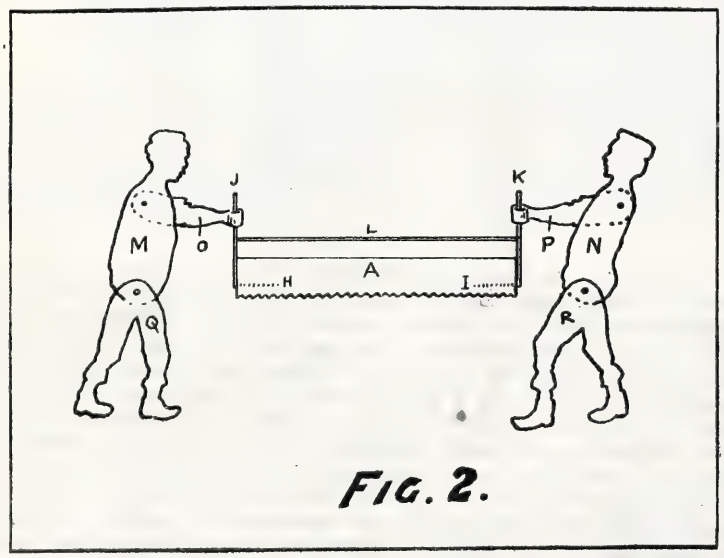


FIG. 2.

To thoroughly understand the way in which the various parts are fitted up, and their relation to one another, reference should be made to the sectional diagram, fig. 3. There it will be easily seen how the various parts are connected. All of them are named, so the diagram is self-explanatory.

The log of wood is painted upon the interior surface of the fixed glass, and is shown by the dotted line, S (fig. 1). In this, figure B represents the sliding glass, E the stop block that prevents it being pulled out too far, and C, the space through which it can move.

On the sliding glass near the saw are painted two separate "streams" of sawdust, T and U (fig. 1). Their use will be seen presently.

A little scenery painted upon the fixed glass and a circular mask will complete the slide, which is then ready for exhibition. We will consider the effect of moving the sliding glass in and out.

Reference being made to fig. 2, it will be seen that if the sliding glass be pushed in, the saw, which is fixed to it, will move from right to left. The body of the left-hand sawer will thus be pushed back, because it is connected to the saw by the arm, O, and pivoted to the leg, R. The body of the right-hand sawer, however, will be pulled forward. Then when the glass is pulled out again, the saw

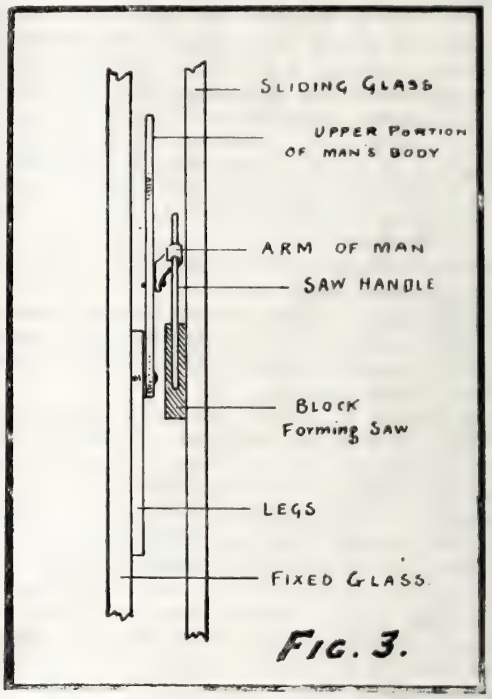


FIG. 3.

will move from left to right, and whilst the body of the left-hand sawer will be pulled forward, that of the other will be pushed back. Thus it will appear as though the two men were actually engaged in working the saw, and cutting the log.

At the same time it will be seen (by reference to fig. 1) that as the glass moves from right to left, the shower of sawdust, T, will suddenly appear in view from behind the log, S, and seem to have been caused



FIG. 4.

by the apparent cutting of the log. When the glass is pulled back this shower will be hidden again behind the log, and the other, U, will appear on the other side of the log. It will easily be understood therefore that the effect of all this is to cause the audience to be under the impression that the wood is actually being sawn through by the two hard-working sawers.

THEODORE BROWN.

MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

To the "British Journal of Photography." *August* 2, 1901.

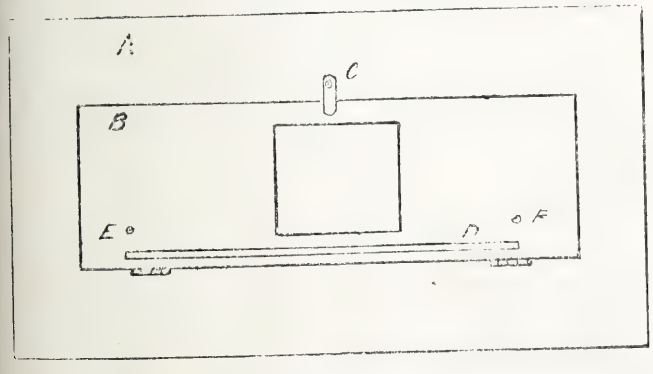
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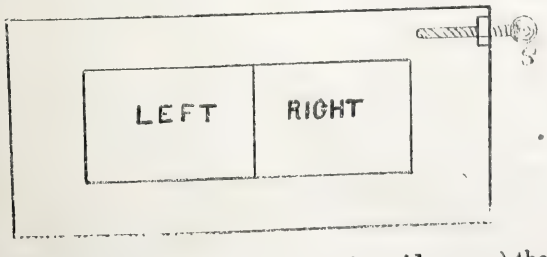
STEREOSCOPIC TRANSPARENCIES.

It is commonly supposed that if stereoscopic transparencies are to be made by artificial light, contact printing must be resorted to. There is no ground for this idea, as they can easily be made in a lantern with a condenser large enough to cover one-half of the negative, and making two exposures on one plate, as has to be done in contact printing.

All that is necessary is a small addition to the easel. A thin board, B, about 10×4 inches, with an opening $2\frac{3}{4} \times 3$ inches high, is



hinged to the easel, A, and secured by a catch, C; a thin strip, D, for the transparency plate to rest on; and two stop pins, E and F, $9\frac{1}{2}$ inches apart, to mark its position. The negative carrier in the lantern has also a stop screw, S, to limit its travel.



In making a transparency (or a print on bromide paper) the procedure is as follows: Place the negative in the carrier, film side next to the condenser, upside down, with right negative in line with the lens, and focus on the opening in the easel, enlarging or reducing as required. When the picture is correct, adjust the stop, S, against the edge of the lantern, so that the carrier may afterwards be returned to exactly the same position. Make a mark on the easel at some prominent object in the foreground of the picture, and withdraw the carrier until the corresponding object is in the same position. Now place the transparency plate behind the board, B, with its end against the stop, E, and make the first exposure. Cap the lens and move the carrier back against the stop, S, and also move the transparency plate to the stop, F, and make the second exposure.

The great advantage of printing in the lantern is the power of using any part of the negative and enlarging to the standard size, and consequently of using a smaller hand-camera than required for plate $6\frac{1}{2} \times 3\frac{1}{4}$.

For some time past I have been using a plate 5×2, half of a 5×4, with $2\frac{1}{2}$-inch lenses, 3 inches apart, which gives negatives $1\frac{3}{4}$ inches square, and enlarging in an ordinary projection lantern to the usual stereoscopic size, and the results are quite equal to full-size taken direct.

Another advantage is that transparencies made in this way require only a ground-glass back, and no cover-glass, as contact ones do.

J. Ritchie.

PHOTOGRAPHY AT THE PARIS INTERNATIONAL EXHIBITION, 1900: THE JURORS' REPORT.

[The following report on Photography, at the Paris International Exhibition of 1900, is extracted from the official Blue Book containing the Reports of His Majesty's Commissioners, which has been recently published by Messrs. Eyre & Spottiswoode. The Juror in the photographic class was Mr. E. Cecil Hertslet, F.R.P.S., who drew up the Report, and to whom we are indebted for directing our attention to it. Mr. Hertslet's report it will be observed is a comprehensive one, dealing as it does with the whole of the photographic exhibits. The Juror's notes are necessarily brief, but they nevertheless give an excellent idea of the comparative position of photography in the various countries that took part in the Paris Exhibition, and their presentation in full in these pages will no doubt be welcomed by readers at home and abroad.—Eds. B. J. P.]

The Photographic Section of the Exhibition is the largest and most complete collection of apparatus, materials, and finished photographs ever brought together; but it is dispersed over so great an area that it is difficult, without special study, to appreciate it as a whole. It is true that the French section in the Champ de Mars forms the nucleus of Class 12, from which the British pictorial and scientific exhibits are at no great distance and on the same level; but the British trade exhibits and the most important sections of other countries are on the ground floor of the building, and so separated from their own class, while the German photographs and those of many countries of minor importance so far as Class 12 is concerned, the exhibits of India and the British Colonies, and the French colonial exhibits are scattered among the various pavilions in the Rue des Nations and the Trocadéro Gardens.

The proceedings of the Jury, which were much influenced by the

counsels and experience of the aged President, M. Davanne, were marked by complete harmony, and the exhibitors of every nationality may feel assured that no time or pains were spared to arrive at a just decision on every point.

The most remarkable exhibits are those of France, Great Britain, Austria, Germany, Italy, Russia, Switzerland, and the United States.

Great Britain and British Possessions.

It has been estimated by competent authorities that the output of photographic materials in the United Kingdom is four times as large as that of France, and it is regrettable that while the latter country is worthily, indeed lavishly, represented by examples of all its principal manufacturers and photographers, the British exhibits should form, comparatively, but a small feature of the Exhibition, the British trade exhibits being confined to five manufacturing firms, and the professional photographers limited to a few specimens in a collective exhibit. This may be accounted for by considerations of space, but it is also partly due to an impression on the part of some British firms that it is hardly worth their while to exhibit their apparatus on the Continent, owing to the difference between the standard sizes in use in England and abroad.

It will be convenient to consider the British exhibits under three headings: (1) Manufacturers of Materials and Apparatus, (2) Scientific and Pictorial Photography, (3) India and the Colonies.

(1) *Manufacturers and Dealers.*

The British manufacturers and dealers who take part in the Exhibition are Messrs. J. H. Dallmeyer, Ltd., Messrs. Newman & Guardia, Messrs. Ross, Ltd., Messrs. W. Watson & Sons, and Messrs. A. W. Penrose & Co., and it is a matter for congratulation that these few firms, on whom fell the burden of worthily representing their country, should have acquitted themselves in such a satisfactory manner that each was awarded a Gold Medal.

Messrs. J. H. Dallmeyer show their various series of stigmatic lenses intended for portraiture, as well as for the most rapid instantaneous views, tele-photographic lenses, hand and stand cameras, and a new camera for tele-photographic work.

Messrs. Newman & Guardia have a strong exhibit of cameras of excellent workmanship, photographic accessories of various kinds, and a complete set of apparatus for cinematographs. This firm has not hitherto shown its work at an international exhibition. Its exhibit at Paris is of great merit, and its illustrated catalogues, published in English and French, favourably impressed the members of the Jury.

Messrs. Ross's exhibit consists principally of lenses for portraits, landscapes, and reproductions. These include a new series of symmetric anastigmats working at a large aperture. Messrs. Ross's lenses are beautifully finished, and the arrangement for the iris diaphragm is a very convenient one.

Messrs. W. Watson & Sons send an exhibit which maintains the high reputation enjoyed by this firm in France. Its special features are a studio camera and stand of great solidity and firmness, the "Acme" camera for lightness and rigidity, the "Alpha" camera for portability and compactness, and the general finish and regard to detail of all the photographic apparatus shown.

Messrs. A. W. Penrose & Co.'s exhibit is entered in Class 11 (Typography, &c.), but as they also show apparatus of all kinds for photo-mechanical work, and especially a process engraver's camera with colour screens their stand was visited and judged by the Jury in Class 12.

Adjoining the above British trade exhibits are specimens of collotype printing by Mr. Walter Griggs, and specimens of process work by the Strand Engraving Company.

(2) *Scientific and Pictorial Photography.*

The collective exhibit of British technical, scientific, and pictorial photography is divided into two sections: (A) Technical and Scientific (including Professional Portraiture), and (B) Pictorial.

(A) *Technical and Scientific Photography (including Portraiture).*—The most important exhibit in Section A is a beautiful collection of stellar transparencies by the Royal Observatory, Greenwich. Although this exhibit is a small one, the Jury awarded it a Grand Prix, placing it third on the list in Class 12 in order of merit. Other notable exhibits in this section are those of Sir Norman Lockyer, K.C.B. (spectrum and astronomical photographs); of the Autotype Company (photographs in carbon); of Captain E. H. Hills, R.E. (photographs of the eclipse of 1898); and of Messrs. T. & R. Annan, of Glasgow. Professional photography is represented by a few frames sent by Mr. F. Hollyer, of London; Messrs. Werner & Sons, of Dublin; Mr. W. J. Byrne, of Richmond; and Messrs. Lafayette, Ltd., of London.

The exhibits in Section A of the British collection were entered separately in the French official catalogue; and, instead of treating them collectively, the Jury, with great patience and some difficulty, examined each frame separately, and judged it on its merits. It was not easy, in the absence of any system of numbers or arrangement, to avoid missing some of the frames, but the judging of all the entries was eventually accomplished.

(B) *Pictorial Photography.*—Section B (Pictorial) was treated as a single collective exhibit, and thus placed on the same footing as the Photo Club of Paris, the Camera Club of Vienna, and the Russian collection. The photographs were not, therefore, judged individually. The collection was awarded a Grand Prix, and was the only exhibit so honoured in the British Section except that of the Greenwich Observatory. Among the most attractive pictures, in the eyes of the Jury, were the four fine photographs sent by Mr. A. Horsley Hinton, a landscape ("Homeward") by Mr. Karl Greger, and a portrait by Mr. W. Crooke. There are other landscapes by some of the best-known English workers, such as Messrs. J. Craig Annan, E. R. Ashton, R. Craigie, J. H. Gear, C. Moss, H. P. Robinson, R. Robinson, F. M. Sutcliffe, W. Thomas, Colonel Gale, Viscount Maitland, &c. There are also some architectural studies by Messrs. J. H. Avery & Co., Mr. Harold Baker, and Mr. H. W. Bennett.

(3) *India and the Colonies.*

The British Colonies and Possessions represented at the Exhibition are India, Canada, Ceylon, Mauritius, and Western Australia, and they all compete in Class 12.

India has only one entry, a collective exhibit of forestry, including many large photographs, mainly topographical.

The most remarkable of the Canadian exhibits are those of Messrs. Lapres and Lavergne, of Montreal, and of Mr. E. J. Rowley, of Toronto. Mr. C. S. Cochran, of Hamilton, sends some good portraits and landscapes.

The Ceylon exhibit is a strong one. The best work was sent by Mr. Skeen, a professional photographer, who is very skilful in native subjects, and by Mr. A. W. A. Plâté, who has some good enlargements and studies from the nude. Good photographs were also sent by Mr. H. C. P. Bell, archæologist of the Government; by Messrs. F. W. Bois and H. W. Cave, amateurs, and by the Colombo Apothecaries' Company.

In the Mauritius Pavilion there are some photographs by Mr. Drenning.

In that of Western Australia there is a collective Government exhibit, consisting of numerous photographs of large size illustrating the scenery and industries of the Colony.

France.

The French exhibits are not only the most important in Class 12, but they are equal in number to those of the rest of the world combined, and this in spite of the fact that the cost of the showcases was double that of the exhibition of 1889.

The most remarkable exhibit is that of Messrs. Lumière & Sons, of Lyons, and it is in every way worthy of the high reputation enjoyed by this firm, not only on the Continent, but in Great Britain. It includes the well-known Lumière plates and papers, cinematographs and films, artistic photographs, and transparencies of the moon of considerable size and perfect in detail, besides some very interesting three-colour transparencies. This firm was placed first on the list of Grands Prix awarded by the jury in Class 12.

Other prominent French exhibitors are Messrs. L. Gaumont et e, and Messrs. Demaria Frères, whose cameras and other apparatus e of excellent workmanship; M. Gaston Braun, who shows some agnificent specimens of his carbon reproductions of works of art; . Fleury-Hermagis and M. Turillon, whose lenses are much in mand in France.

M. Paul Nadar, of Paris, M. Nadar, of Marseilles, M. Provost, of oulouse, M. Boyer, of Paris, and M. Bellingard, of Lyons, are the remost representatives in the Exhibition of French professional ortraiture. The work of these photographers is of high quality, id their exhibits are worthy of the reputation of the authors. It noticeable that the carbon process is very extensively used in rance for the best portrait work in large size.

M. Dujardin and M. Reymond show some good work in photo- avure, and M. Mathieu-Delaroche some photographic miniatures i ivory. Messrs. Poulenc Frères and Messrs. Duplessy et Hinque ave some specimens of photographic chemicals, of which the urity was highly appreciated by the jury. M. Lippmann shows me of the latest results of his scientific researches in regard photography in natural colours. M. Damoizeau has an apparatus lled the cyclograph, arranged to take, in a single operation, ther the whole or a portion of the horizon. Some results are hown, and are quite satisfactory. M. Sigriste has an interesting xhibit of hand cameras, and a shutter with a new system of time easurement.

The French exhibits are remarkable for their number and variety, nd for the high standard which is generally attained by the xhibitors. The hand camera is making rapid advances in opularity, and is shown at the Exhibition under every form and t all prices, a sign of the times which is not very encouraging to ose who have at heart the advancement of serious photography. he extraordinary cheapness of some of these instruments is very markable, a fair camera being procurable for 9fcs. 25, while thers are on sale at an even lower price. The binocular form of and camera is a speciality of the exhibit of M. Joux, and this form f instrument, which would seem to be taking the first place in rance among the various forms of hand camera, is also shown by a reat number, if not by the majority, of the manufacturers of photo- raphic apparatus.

Next to the hand cameras, the cinematographs claim attention. Many examples of these instruments are shown, and the perfection of oth apparatus and films is very creditable, when the comparatively ecent period of their introduction is borne in mind. Other notice- ble objects in the French section are the lenses, which are now ractically equal in quality to those made in Germany, and are much heaper; the stereoscopes, and some photographs in several colours roduced by different shades of superposed carbon tissue. There is n increasing use of aluminium in place of brass for lens and camera ittings.

French pictorial photography is represented by a collective exhibit of the Photo Club of Paris, to which most of the best-known Parisian workers, including Messrs. Demachy, Maurice Bucquet, and Puys, send contributions. The photographs are of very varied merit and mostly of small size. The President of the Photo Club was a member of the jury, and the exhibit was, therefore, *hors concours*.

French Colonies.

The French colonies competing in Class 12 are Algeria, French Congo, the Ivory Coast, Dahomey, Pondicherry, Tahiti, Guadeloupe, French Guiana, French Guinea, Indo-China, Madagascar, Mayotte, Martinique, New Caledonia, Réunion, Senegal, and Tunis.

Algeria is the only colony which shows really good work. The photographs by M. Frechon, of Biskra, in this section are very remarkable, giving, as they do, in an unusually successful manner, the effect of sunlight. The remaining French colonial exhibits are in many cases interesting from an ethnological or geographical point of view, but they are very poor as photographs. Some, indeed, and notably those from the West Coast of Africa and New Caledonia, are most primitive in their execution, and the jury viewed them with some surprise, even after allowance had been made for the extreme difficulty of carrying out photographic processes in tropical climates. The Madagascar exhibit contains some proofs by a native photographer.

Austria.

The Austrian exhibit, which contains twelve entries only, consists entirely of photographs or photographic reproductions, no apparatus being shown. The second Grand Prix in order of merit in Class 12 was awarded to the Imperial School of Graphic Art at Vienna, of which Dr. J. M. Eder is the president. This exhibit consists of beautiful specimens of all kinds of photographic processes, including platinotype, carbon, gum-bichromate, photogravure, collotype, and photographs applied to scientific purposes. There are also some interesting photolithographs direct on aluminium. I regret that I am precluded by considerations of space from entering into greater detail in regard to this exhibit, which is unquestionably one of the most remarkable of all those which came under the consideration of the jury.

Messrs. Angerer & Göschl, of Vienna, who send a small but very good collection of photographs, including some printed in four colours, and Mr. J. Loewy, of Vienna, who sends examples in heliogravure, autotype, and carbon, each received a Grand Prix.

The Camera Club of Vienna, consisting of amateur photographers sent a small but very artistic collection, which, from a purely pictorial point of view, equals, if it does not excel, any other exhibit in Class 12. Mr. Philip von Schoeller sends eight pictures out of the fourteen which form the total of the collection, the others being contributed by Dr. Herrneberg, Baron Liebig, Professor Watzek, and Dr. Spitzer. There are some striking examples of gum-bichromate.

Other remarkable exhibits in the Austrian section are those of Messrs. Husnik and Häusler (prints in three colours), M. R. Paulussen (prints from aluminium plates), and M. J. Vilim (reproductions in three colours).

Germany.

The German exhibit is a strong one, especially in lenses. After long deliberation and discussion a Grand Prix was awarded to Messrs. Zeiss, of Jena, this being the only Grand Prix awarded to an optician in Class 12. To avoid any misunderstanding on this point, the jury adopted the resolution of which the following is a translation, and directed that it should be inserted textually in their official report:—

"In placing the house of Messrs. Carl Zeiss in the first rank, among all the opticians of France, Germany, and England, the International Jury has desired expressly and exclusively to render homage to the initiative taken in the recent transformation of photographic optics by the group of eminent scientific men who direct this establishment."

Besides Messrs. Zeiss, the other great opticians, Messrs. Goerz, of Berlin, M. Steinheil, of Munich, and Messrs. Voigtlaender, of Brunswick, have very strong exhibits of lenses.

A Grand Prix was also awarded, in the German section, to Messrs. Meisenbach Riffrath & Company, of Berlin, for their photographic reproductions.

Messrs. Falz & Werner have a very good exhibit of apparatus for photo-mechanical work.

The Actien-Gesellschaft für Anilin-Fabrikation has one of the best exhibits of photographic chemicals in Class 12.

Other notable exhibits are those of Professor Max Wolf, of (Heidelberg (astronomical photographs); M. Obernetter, of Munich phototype); M. Anschuetz, of Berlin (reproductions); M. Perutz, of Munich (orthochromatic plates), and the Berlin Photographic Society (photogravures on silk).

Portraiture is represented by M. Müller, of Halle; M. Schaarwaechter, of Berlin; Messrs. Luetzel, of Munich, and many others. M. Schaarwaechter has some good photographs of the German Imperial family.

There is a similarity between German pictorial work in the Exhibition and that of Great Britain and the United States. It is generally low in tone, and the carbon process is much used.

Italy.

Italy has an important exhibit, and one of great artistic merit. The principal photographs are almost entirely in carbon, and include

copies of pictures by the old masters in large size. The carbon reproductions of Messrs. Alinari Frères, of Florence, are some of the gems of the Exhibition, and were awarded a Grand Prix. One print is especially remarkable as having been made from a glass negative, measuring 4 feet 3½ inches by 3 feet 1½ inches.

Messrs. Naya, of Venice, Anderson, of Rome, and Brogi, of Florence, show some excellent reproductions and portraits in carbon. Messrs. Murer & Duroni have some good apparatus, especially hand cameras.

The high level of the Italian section is not maintained throughout. It contains some very poor work, and particularly some badly executed collections of small instantaneous views, which are quite out of place in an exhibit of such high artistic excellence as that of Italy.

Russia.

The Russian section is a large and important one. The most interesting exhibit is a large collection of photographs by the Société Impériale Technique Russe, a society in which scientific men, amateurs, and professionals are united for the advancement of photography, and in whose exhibit each section is well represented. This was treated by the jury as a collective exhibit, and was awarded a Grand Prix.

The best houses of St. Petersburg and Moscow send examples of their professional work, M. Pazetti in particular having some good portraits of the Russian Royal family. There are some satisfactory enlargements of *genre* subjects by M. Lobovikov, of Viatka, an amateur, and some photographs by M. Matouchevsky, a Warsaw professional, illustrating the Peace Conference at the Hague, the latter being of historical rather than of photographic interest.

Switzerland.

The Swiss exhibit is not a large one, but is of a good standard throughout. M. Boissonnas, of Geneva, received a Grand Prix for his very fine reproductions and large portraits in carbon, the colour of the tissue of each print being always selected in the best possible taste. Good photographic work is shown by Messrs. Pricam et Fils, and Messrs. Illin & Jacom, of Geneva; and M. Lacroix, of the same place, has some good examples in carbon and gum bichromate. Messrs. J. H. Smith et Cie., of Zurich, show very fine transparencies, both positive and negative, of great size and in different colours, one of the most remarkable of which is a large view of the Jungfrau. The Photochrom Company, of Zurich, has a large collection of the coloured photographs for which this firm has such a wide reputation.

United States.

The United States section, like that of Great Britain, suffers from the fact that it is not sufficiently representative. Some of the best-known professional photographers do not compete, and only two amateurs show examples of their work. The section is, nevertheless, an interesting one, and contains much that is of great merit. The most important manufacturing firm is that of the Eastman Kodak Company, and it receives a Grand Prix for its cameras of various patterns, and especially hand cameras, the latter being on sale at prices varying from 1*l.* 1*s.* to 5*l.* 5*s.* A new feature is the panoramic hand camera, an ingenious instrument for taking views including an angle of 110°. This is sold at a low price, and is likely to be widely used. The Eastman Company also shows some good enlargements in toned bromide.

Mr. Balles, of Brooklyn, has photographs of yachts under canvas; the Baker Art Gallery, enlarged portraits in carbon; Mr. Rinchart, photographs of various tribes of Indians; Mr. Byron, photographs of theatrical scenes by artificial light; and Mr. Lawrence, some very remarkable direct photographs in large size taken by artificial light. The Bausch and Lomb Optical Company have a good exhibit of lenses and apparatus.

In the Cuban exhibit, which is under the control of the United States, there are some good examples of professional photography, and successful architectural views and landscapes.

Other Countries.

The Belgian exhibit is a poor one, the most noticeable entries being those of the Société Anonyme des Etablissements Malvaux (photochromogravures in three colours), and of Van Monckhoven, of Ghent. The latter shows some enlargements in great size, but they are crude and inartistic. Other exhibitors send enlargements remarkable only for their unusual size.

Bosnia-Herzegovina has an indifferent exhibit of commercial photographs, mostly on shiny surfaces.

Bulgaria has an exhibit of average merit, but of small importance.

The exhibit of Denmark is, on the whole, only of moderate merit. Mademoiselle Steen shows some excellent portraits of the Danish Royal family, taken in unconventional attitudes in the Palace of Copenhagen. M. Petersen has some fair portraits, and M. Tryde some good landscapes.

Ecuador is in the earliest stage of photographic practice. Many of the prints exhibited are imperfectly fixed and are rapidly fading.

The exhibit of Greece is a small one. M. Rhomaides sends a remarkable series of photographs of places of historical and archæological interest.

The Hungarian section contain some good portraits and landscapes, tastefully framed and arranged.

Japan has a small but good exhibit, consisting principally of enlargements, among which those of T. Mitsumura, of Kobé, deserve special mention. H. Mizuno, of Yokohama, shows some photographs on gold and silver lacquer, original in design and indicative of considerable skill.

Only three exhibitors from Luxembourg are represented, but the work shown is interesting and meritorious. M. Bernhoeft has an apparatus for portraiture by magnesium light. The results shown are good specimens of photographic portraiture, owing in a great measure to the fact that the light thrown upon the sitter is indirect. The Luxembourg Amateur Photographers' Club has a good collection of views of places of interest in the Grand Duchy.

Mexico, which is represented by a large number of entries, has an exhibit of moderate interest. The most noticeable photographs are those by Messrs. Perez, Gomez-Gallardo, and Valletto.

Monaco shows an ordinary exhibit of specimens of professional portraiture.

Norway is represented by three exhibitors only, of whom two, Messrs. Szacinski and Worm-Petersen, show enlargements of great size and beauty.

Netherlands, Persia and Peru have small exhibits of no special interest.

The exhibit of Portugal is not a remarkable one; and although there is some good work shown, the average merit is not high. The best photographs are those of M. Bobone and M. Camacho, professional photographers of Lisbon. These gentlemen do not, however, exhibit portraits, but architectural studies and reproductions. M. Carvalho, of Vianna, has some pleasing pictures of various types of Portuguese peasants in different local costumes. A professional photographer of Lisbon sends some architectural studies very badly executed, no attempt having been made to fulfil the elementary condition that the lines in such subjects should be perpendicular. The jury expressed some surprise that such work should have been submitted to them.

The Roumanian section has nothing of special interest, except some portraits of the Roumanian Royal family by M. Mandy, of Bucharest.

Servia has only one exhibit, viz., a poor collection of photographs submitted by the photographic department of the Ministry of War at Belgrade.

There is nothing remarkable in the Spanish section, but M. Fransen and Messrs. Portela & Co., of Madrid, show some good examples of professional portraiture.

Only four exhibitors compete in the Swedish section, but the work is good throughout. M. Hamnqvist and M. Larsson show some excellent specimens of portraiture, and M. Klemming some landscapes and sea-pieces of remarkable softness and beauty.

E. Cecil Hertslet, *H.M.'s Consul-General at Havre.*

LIGHT RAY CURE OF LUPUS.

[In last week's JOURNAL we reprinted from "Nature" an article on "The Treatment of Disease by Light." The photographic system described is that of Professor Finsen of Copenhagen, and it is employed at the London Hospital. Briefly it consists of the treatment of lupus by lenticularly controlled light rays. We are much interested to learn from Messrs. R. & J. Beck, of 68, Cornhill, E.C., that they are supplying apparatus for the purpose; and by their courtesy we are enabled to give the following illustrated description of the system in a modified form, suggested by the experience of the London Hospital to overcome certain defects of the original apparatus.—EDS. B. J. P.]

THE apparatus essentially consists of the electric lamp and rheostat, the crystal collecting lenses and their mounting, the crystal compressors.

THE LAMP

(E, fig. 1) is an arc lamp of the direct current type, taking from 50 to

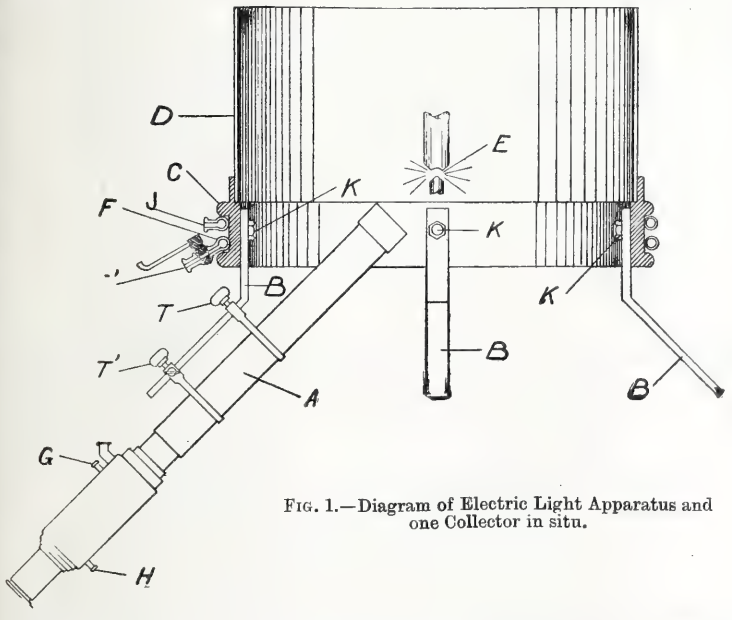


FIG. 1.—Diagram of Electric Light Apparatus and one Collector in situ.

80 ampères at 70 volts pressure, and generating a light of approximately 30,000 candle power.

The lamp is surrounded by a ring (C, fig. 1), which is rigidly suspended from the ceiling of the building at a height of six to seven feet from the floor, and is shaded by a cylindrical hood (D). This ring has been redesigned on a more substantial model. Four sets of crystal collecting lenses (A, fig. 1) are mounted on brackets (B, fig. 1) which are attached to the ring (C) and can be adjusted vertically by the bolt at K, in order to accurately allign them with the light.

Around the ring (C) are placed two pipes (F and F) which are used for the water cooling circulation afterwards described.

The upper screw (T) is a clamp which carries the weight, but allows of an adjustment at the lower clamp by means of the screw (T') working against the spring (U). This allows of a small inclination to compensate for irregularities in the burning of the lamp.

A further adjustment by means of the screw (V) is provided for deflecting the collector in the opposite plane. After the apparatus has been set up, the adjustment screw (T') is the only one that is made use of, provided the lamp is sufficiently firmly suspended to prevent oscillation.

Within the body tube (A) a drawtube (B) slides, which can be fixed at any position by the clamp (S), by this means the focus of the the light and consequently the size of the image can be adjusted.

The drawtube (B) carries a pair of rock crystal lenses (G and H). The space between the lenses (G and H) is filled with distilled water to absorb the heat rays from the light, a tube (O) with a hinged cap being provided for the purpose of filling. The greater portion of this absorption chamber is surrounded by a water jacket (D), through which a constant stream of water flows through the nozzles (NN) The collector is so made that all the lenses can be removed for cleaning, and the joints at any time re-made by the insertion of fresh rubber washers.

THE COMPRESSORS.

The compressors (fig. 3) consist of two rock crystal lenses (A and B) with a space for the circulation of water between them. The lens B

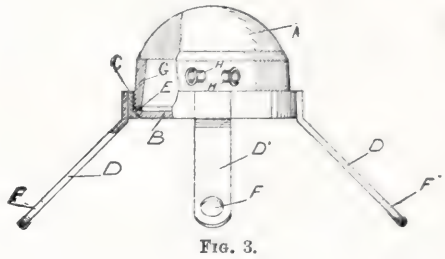


FIG. 3.

is parallel, whilst the outer one (A) is of the required curve to fit that portion of the body being treated. H H' represent the tubes through which the water is conveyed. The arms (D D' D") form handles which

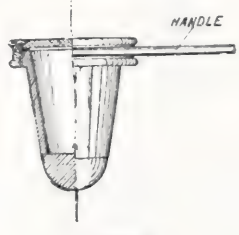


FIG. 4.

enable the operator to hold the compressor without impeding the view through the lens (B). They have also holes provided (F F' F") to

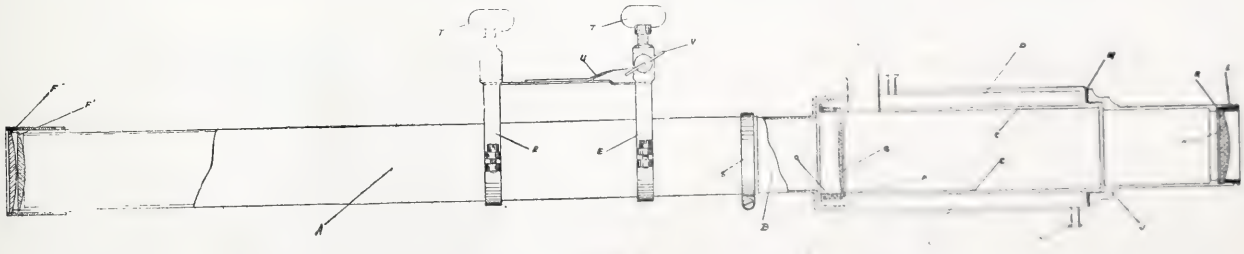


Fig. 2.

THE CRYSTAL COLLECTORS.

Each of these (fig. 2) consists of a tubular mount, containing four rock crystal lenses. At the end nearest to the light are two lenses (FF, fig. 2) in tubes which slide on to the body of the collector, and can be removed for cleaning. Near the centre of the body tube are two clamps (EE, fig. 2) for attaching the apparatus to the bracket.

enable the compressor to be attached to the patient by elastic bands. By unscrewing the ring (C) the back lens (B) and its rubber washer (E) can be removed and all parts got at for cleaning.

The most useful shaped compressors are those figured A, B, C, D, E (fig. 5) and a special form (fig. 4) with holder for treating sunk parts, such as the corner of the eye.

The Water Circulation.

The supply tank which is connected to the pipe (F, fig. 1) must be situated at a considerably higher level than the apparatus, from the tap (F', fig. 1), by means of an indiarubber tube the water flows to the

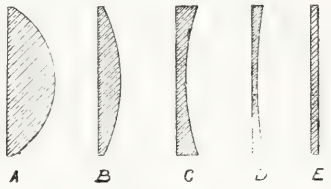


Fig. 5.

nozzle (G) of the water jacket, thence through the nozzle (H) by means of another indiarubber tube to one of the nozzles of the compressor, the other nozzle of the compressor is connected by an indiarubber pipe to the waste pipe (J) from which the water runs to waste.

Sun Apparatus.

This consists of a water lens (fig. 6) with a thin glass back and a curved front, filled with a solution of methyl blue. It is mounted in

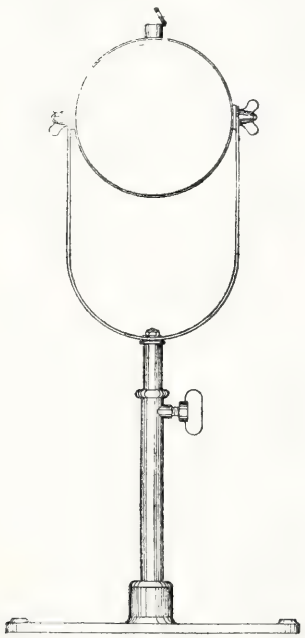


Fig. 6.

gimbals on a heavy table stand, with a vertical adjustment and clamp, and the lens can be taken apart for cleaning.

The compressors that are used with the electric light apparatus are employed with the sun lens, to which the proper water circulation must be provided.

The Installation also requires coloured spectacles for the use of the operators, red paper for constructing a curtain below the arc lamp, and cloth caps to place over the upper ends of the crystal collectors immediately the light is turned off, in order to prevent the lenses being fractured by the current of cool air.

PRACTICAL TRICOLOUR PHOTOGRAPHY.

[A paper read before the Royal Photographic Society.]

I.

The details in this paper have exclusive reference to the special application of tricolour photography, in which typographic screen blocks are used as the method of printing. They have also exclusive reference to what is termed the direct method, that is to say, screen negatives having correct colour values are taken direct from the original, either with daylight or artificial light; the two great difficulties which have hitherto barred the adoption of this direct method have been the long exposure necessary—and the spreading, through halation in the film, of the screen dots. In the method herein described, the first, I believe, published in which full working details are given, both these difficulties are overcome, the former by the use of colour filters of very perfect transparency, and the latter by the use of desiccated plates.

The process is based on the teaching of Professor Clerk Maxwell and Louis Ducos du Hauron, the colour filters being substantially identical as regards the rays they transmit with those used by Professor Maxwell; the actual solutions used by him are not employed because in two cases they are unstable, and in the third case (copper chloride), the slightest alteration in the strength of the solution materially alters the absorption. The transparency of the three solutions is also not sufficiently perfect.

Colour Filters.

Liquid filters are employed and, colour qualities being equal, choice is given to inorganic salts in preference to dyes as being more constant in composition and colour absorption, more convenient in use and more readily obtainable. All the dyes and salts employed are obtained from Hopkin and Williams.

Stock Solutions.

Potassium chromate (yellow)	1200 grains.
Water sufficient to make total bulk	10 ounces.
Potassium bichromate (red)	300 grains.
Water sufficient to make total bulk	10 ounces.
Eosine (blue shade)	120 grains.
Water	10 ounces.
Methylene blue	5 grains.
Water	10 ounces.

All these solutions are filtered several times or allowed to stand several days and the clear portions decanted.

Filters for yellow printing negative (carefully filtered).

Eosine (blue shade) stock solution	180 minims.
Water	20 ounces.

Used in quarter-inch section.

With this filter the whole of the ultra-violet rays passed by the lens and to which plates are sensitive, are allowed to act, and at the same time the eosine subdues the blue-green (spectrum); the result is to strongly differentiate the yellow printing negative from the others.

Up to the present we have found with most subjects that the advantages of this extra differentiation more than counterbalance the disadvantages: should it be preferred to work without the ultra-violet rays, the following formula is employed:—

Eosine (blue shade) stock solution	20 minims.
Potassium chromate (yellow) stock sol...	100 „
Water	20 ounces.

Used in quarter-inch section.

Should it further be desired to increase the effect of the blue-greens the eosine is omitted or reduced in quantity.

It will be observed that by increasing or diminishing the quantity of eosine and yellow chromate respectively, the spectrum action can be shifted laterally in either direction and either concentrated in one band or spread over a considerable area.

Filters for crimson printing negative (carefully filtered or decanted).

Potassium chromate stock solution.....	300 minims.
Methylene blue „ „	110 „
Water	20 ounces.

Used in quarter-inch section.

With this filter the aim is to obtain the maximum effect in the greens combined with an equal action in the yellow-greens and blue-greens, this being necessary owing to the general lack of green luminosity in natural objects and pigments.

If desired more or less blue-green can be allowed to pass by weakening the yellow chromate or *vice versâ*.

If more or less of the yellow end of the spectrum is desired the methylene blue is weakened or *vice versâ*.

Filters for blue printing negative (*carefully filtered*).

Potassium bichromate, stock solution....	20 ounces.
Eosine (blue shade) „ „	250 minims.
Ammonia ·880	250 „

Used in quarter-inch section.

The ammonia is to redissolve the precipitate formed by the eosine when added to the bichromate solution.

With this filter the whole of the red end of the spectrum rays is allowed to act so far as the rays affect the Series B, Lumière plate, the aim being to obtain the maximum effect in the red. The other limit in this filter is practically identical with the D sodium line, the action ending abruptly at this point; should it be preferred to carry the action further towards the green, the eosine can be reduced in quantity or omitted altogether.

When taking the negatives the following is the order and method of procedure:—

Example.

The copy is fixed on the copying board, taking the usual care to ensure perfect flatness, and the prism being accurately levelled the image is roughly focussed on the screen the size required. The image is then centred by shifting the lateral or vertical portions of the copying board. The electric lamps are adjusted as near as possible to the copy as will ensure an equal illumination of all parts, and at the same time give freedom from surface reflections in the direction of the prism.

A glass cell which has been cleaned with a dilute (1–60) solution of hydrochloric acid, then thoroughly washed with water, is filled with the colour solution for the yellow printing negative, and the outer sides of the cell being perfectly cleaned and polished, it is placed in its position behind the lens, and the image accurately focussed with the aid of an eye-piece (focussing lens).

The Levy screen, which may be of any ruling with its lines at angles of 15 and 75 respectively from the base, that is the bottom edge of the camera, is placed in position and adjusted so that it will be at a suitable distance from the surface of the sensitive film. The actual distance varies with the size of the stop and the scale of gradation of the original, bearing in mind the necessity for keeping the exposure as short as possible; it is convenient in practice to employ a short screen distance in conjunction with a relatively large stop; we find a distance of $\frac{8}{64}$ of an inch between the ruled surface and the sensitive surface, combined with a 133 line ruling and a working aperture in the lens of *f*-45, a suitable adjustment for a large percentage of copies. It is obvious that special methods of measuring the *f* ratio will be required where different-shaped stops are used. It is to be understood that in this example a square-shaped stop is being used with its four sides diagonally across the rulings of the screen and the measurement for *f* ratio taken as the length of one side. For the yellow printing negative Mawson lantern plates are employed.

The plate is first taken and placed on an electric heater at a temperature of about 220° F. for two minutes, sliding it about to ensure all parts being equally heated; it is then placed against an upright support and painted on the back with :—

Avery's backing	1 part.
Water	1 „

It dries immediately and is placed in the slide for exposure. After exposure the backing is removed by wiping with a wet sponge, taking care not to get any on the film side; the plate is then ready for development.

The formula published with Mawson lantern plates, but more concentrated, is employed for all three negatives.

Stock Solutions.

No. 1.

Hydroquinone	240 grains.
Potassium bromide	240 „
Sodium metabisulphite	240 „
Water	30 ounces.

No. 2.

Potash (caustic)	480 grains.
Water	30 ounces.

For development equal parts of each solution are taken.

It should be noted that the concentration of the developer is adjusted so that it will be as strong as possible consistent with getting clean images. The development is carried as far as practicable without veiling, the usual test being to watch the shadows on the plate; the development being carried on until these parts show a tendency to veil, when the action is immediately stopped. After development the plates are rinsed and placed direct in the fixing bath.

Fixing.

Sodium thiosulphate (hypo)	4 ounces.
Water	20 „
Sodium bisulphite	4 „
Water	20 „

For fixing we take :—

Hypo solution	20 ounces.
Bisulphite solution	2 „

When fixed the plates are laid in a large porcelain dish slightly tilted at one end and through which a stream of water is flowing; after five minutes' washing they are placed for ten minutes in :—

Alum	1 ounce.
Water	20 ounces.

After the alum bath they are washed ten minutes in the manne as described after fixing.

Beyond the question of getting a clean negative with freedom from ordinary defects, the negative is judged as to whether its dots will give colour values corresponding with the original or a modification of the same which may be required; for example, the subject may very likely be one which has a strong yellow tint all over, in which case there will be no violet and very little blue, and if this same quality is required in the reproduction this negative will practically be the same all over. On the other hand, another subject may have yellow high lights without whites, and yet another subject pure blue and violet colours, the latter being very essential; in this case the negative for the yellow printer will practically be a positive in so far as the luminosity of the copy is concerned.

Where it is required to obtain the full scale of yellow colour in the print, the dots in the shadows should be slightly larger than required in the finished negative to allow for the subsequent reducing. The dots in the high lights, on the other hand, should be more than touching one another, also to allow for the subsequent reducing and the powerful lead in intensification.

The negative being considered satisfactory is left in the washing bath while the crimson printing negative is being proceeded with and for this a Lumière Series A is used.

The colour cell which has been used for the yellow printing negative is taken from the camera, the solution returned to the stock bottle, and the cell thoroughly rinsed with tepid water and drained for two minutes by placing it upside down on pure bibulous paper. It is then filled with the colour filter for the crimson printing negative, carefully wiped on its outer sides and reinserted in the camera without re-focussing.

The same ruled screen is used as for the yellow printing negative, but turned so that its other side is now next the film, and the ruling at angles of 75 and 15 respectively from the base, the distance of the ruling from the film being kept the same. The position of the stop

is also altered to suit the altered position of the rulings, *i.e.*, so that its sides diagonally cross the screen rulings.

The Series A Lumière, which is employed for this negative, is desiccated and backed in precisely the same manner as the previous plate, a deepened light or other suitable means being employed to avoid fogging from light action.

The chief point to be considered in this negative is to carry the exposure of the green portions of the subject as far as possible without blocking up the dots representing the high lights; every assistance, such as screen distance, shape and size of stop which can aid this result being utilised, the reason for this special attention being largely due to the lack of green luminosity in the Prussian blue pigment almost universally employed for printing.

The second negative being finished and satisfactory the cell* is rinsed, washed, drained, and with its fresh solution for the blue printing again placed in the camera, precautions being taken all through these several occupations to avoid any movement of the camera, lens, prism, copying board, &c.

For this negative a separate ruled screen is employed with its rulings at 45 degrees to the base, so that it does not matter which side faces the sensitive plate. The position of the stop is altered so that its sides are correctly placed as compared with the screen, and for this negative the screen distance and ratio of stop remain the same as in the other two negatives.

The Series B Lumière plate employed is treated as in the other cases, suitable precautions being taken against light when in the dark room.

In this negative also the plate is exposed so that the reds can act fully on the plate; in fact they should generally be as near high light as possible.

The three negatives being judged satisfactory, the final operations of reducing, &c., are carried through.

Reducing.

The iodine and cyanide formula is employed.

Stock Solutions.

Potassium iodide	240 grains.
Iodine	120 „
Potassium cyanide	480 „
Water	10 ounces.

For use (mixed immediately before required) take:—

Cyanide solution	240 minims.
Iodine	40 „
Water	4 ounces.

The plates are placed in a white porcelain dish, the mixture poured over and the image reduced until on examination the smallest shadow dots begin to disappear. In practice in order to reach this point without failure from local action, &c., the plates are taken out of the solution, rinsed under the tap, and examined with a magnifying glass at successive stages of the reduction; when the plates are re-immersed in the reducer, the reducing action reduces much more rapidly. When sufficiently reduced the plates are washed for ten minutes or longer as before described; they are then ready for intensification.

Intensification.

The lead intensifier, commonly used with wet plates, has been very successfully adapted for use with dry plates by Mr. Symmons, and is now employed for strengthening the opacities of the dots in all the negatives.

Stock Solutions.

Nitric acid (commercial)	1 ounce.
Water	60 ounces.
Lead nitrate	480 grains.
Water	20 ounces.
Potassium ferricyanide	480 grains.
Water	20 ounces.
Ammonium hydro-sulphide	1 ounce.
Water	3 ounces.

The negatives are first placed in the nitric acid solution for one minute (a little longer or shorter period is not important except so far as it may induce frilling), washed five minutes and then placed in—

Lead nitrate solution	2 ounces.
Ferricyanide solution	2 „

until the image is yellow in colour through to the back of the film; they are then washed until the yellow colour bleaches, that is, it becomes white. They are then given a second bath in the nitric acid solution, one minute, washed five minutes and blackened with the ammonium hydro-sulphide, washed two minutes, treated with a third bath of nitric acid and again washed ten minutes and finally allowed to dry.

Block Making.

The blocks for tricolour printing are carried through in much the same way as ordinary monotone subjects, and as it is not intended that this paper should be a treatise on block-making, only the main lines of the process are given—a good plane surface of homogeneous hard metal, free from scratches, dents, and other mechanical defects being chosen.

The plates, which we shall suppose are of copper a quarter of an inch larger than sufficient to include the subject, are cleaned by placing them on a thick pad of rubber lying in a sink and scrubbing with double washed emery and a hard brush (sold in the trade under the designation of a copper-plate polishing brush) until they are free from grease, tarnish and stains; they are then scrubbed with the same brush with washed whiting to give the plates a smoother surface than that imparted by the emery. Then are then rinsed under a stream of water and attached to the whirler, clean side uppermost, taking care that they are centrally adjusted, and after wiping with a clean cloth to remove traces of whiting and rinsing under the tap they are ready for the sensitising solution.

Sensitising Solution.

Any solution suitable for blocks can be used, the following formula being a useful one:—

No. 1.

Fish glue (clarified)	3 ounces.
Chromic acid (saturated solution)	5 minims.
Ammonium bichromate	120 grains.
Water	5 ounces.

No. 2.

White of fresh eggs	3 ounces.
Water	5 „

No. 2 is beaten up and added to No. 1, and the mixture allowed to stand twelve hours. It will keep good in a cool place for three weeks or more. Immediately before it is required for coating the coppers, it is filtered through a piece of washed cotton wool which has been placed in the neck of a funnel and moistened with water.

The sensitising solution is poured over the copper plate, held by the pneumatic holder so that its outer surface is horizontal, from one corner, and the plate tipped so that the fluid runs along one side, round the next side, and finally drains off the last corner; this operation is repeated a second time from the same corner as before, and a third quantity of the fluid is then poured on the centre of the plate and before it has time to spread to the edges the whirler is turned over, so that the plate is now undermost, and immediately over a heated plate (lying on a ring Bunsen burner) and at the same time is slowly whirled until the film is perfectly dry (about two minutes); this operation is conducted in a room lighted through yellow glass.

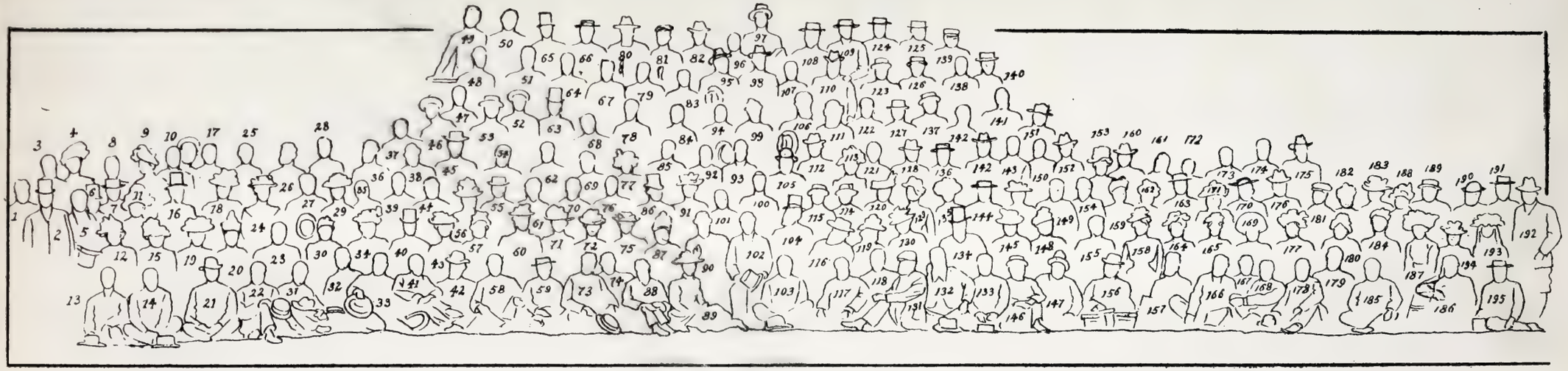
Howard Farmer and Guy Symmons.

* Instead of using the same cell for all three-colour filters, separate cells which have been optically ground to plane surfaces or which have been selected and carefully tested, can be used.

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MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

To the "British Journal of Photography." *September 6, 1901.*

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THE RADIO-ACTIVITY OF MINERALS.

Amongst the many uses to which photography is put, its employment in the detection of the radio-activity of certain minerals and chemical compounds is one of great interest, and one which may eventually prove to be of considerable commercial value. This new branch of photography, which at present may be said to be in its infancy, already gives promise of opening up a wide field of very interesting experimental research work for the photographer who possesses a knowledge of chemistry, or who is something of a mineralogist.

Minerals are said to possess "radio-activity" when they have the power of emitting rays which are capable of affecting a sensitive photographic plate. By a series of elaborate experiments, M. Henri Becquerel has proved that compounds of uranium not only possess the power of affecting a photographic plate through bodies that are generally looked upon as being opaque to light, but that their rays have the power to discharge an electrometer, and are capable of being deflected by a magnet. These remarkable uranic rays have been appropriately called the Becquerel rays, after their discoverer. Thorium has also been found to emit rays which act upon the sensitive photographic plate; and two bodies called polonium and radium, recently discovered by the celebrated French savants, M. and Mdme. Curie, possess very great radio-activity.

Since the discovery of polonium and radium by M. and Mdme. Curie, this interesting subject has been engaging the attention of Sir Wm. Crookes, F.R.S., and several other eminent English men of science, with the result that we have now a considerable and growing list of minerals all more or less possessed of radio-activity. Of course, the minerals employed in these experiments have been gathered from many localities and sources, and it is interesting to note, that according to the different localities from which the supply was obtained, so the action upon the photographic plate was found to vary, in some cases to a considerable degree. This varying of the radio-activity is particularly noticeable in the case of pitchblende, specimens procured from Cornwall having so far given the most brilliant results, while others collected from elsewhere showed a much smaller degree of activity.

Placed in the consecutive order of the intensity of their radio-activity, the following is a representative list of the minerals at present known to possess these rays:—Pitchblende, uranite, autunite, orangite, thorite, euxenite, samarskite, alvite, broggerite, monazite, xenotime, arrhenite, sipilite, fergusonite, chalcolite, and hielmite.

Sir William Crookes has carried out a long series of most interesting experiments, with a view to separating the radio-active body from uranium compounds, crystallised uranium nitrate being chiefly employed. The first suggestion of the possibility of accomplishing the separation of the radio-active body appears to have originated in Sir William Crookes' discovery that uranium nitrate, which by repeated crystallisation had been brought to a high standard of purity, had lost its radio-activity entirely.

It would take far more space than is at my disposal, to enter minutely into all the details of the various experiments which have been tried. Ether was found to readily dissolve uranium nitrate, but failed to dissolve or separate the radio-active body. Various methods of fractionation were employed with the result that a highly active uranium nitrate was produced, a portion of which on being dissolved in water, and ammonia added in excess, gave a precipitate of yellow ammonium uranate. After being evaporated to dryness and heated



Photograph of a piece of Cornish Pitchblende

with nitric acid, the precipitate and residue were placed in cells upon a photographic plate; and on this plate being developed, the whole of the radio-activity was seen to be in the ammonium uranate, clearly showing that the radio-active body is precipitated by ammonia. To this insoluble precipitate, the radio-active body of uranium nitrate, Sir William Crookes has given the provisional name UrX—the unknown substance in uranium. The exact nature of this radio-active body has yet to be determined.

Recent experiments point to a possibility of the radio-active substance peculiar to thorium also being eventually separated, and when this has been successfully accomplished, we may very likely be able to get nearer the determination of the nature of these curious bodies.

The apparatus required for employing the radiographic test for detecting these active substances in minerals and precipitates is simple in the extreme, and is already in the possession of every

photographer, namely, a dark room, a packet of photographic plates, one or two light-tight boxes (old half-plate boxes answer admirably), and the developer wherewith to develop the plates after they have been exposed to the influence of the radio-active bodies.

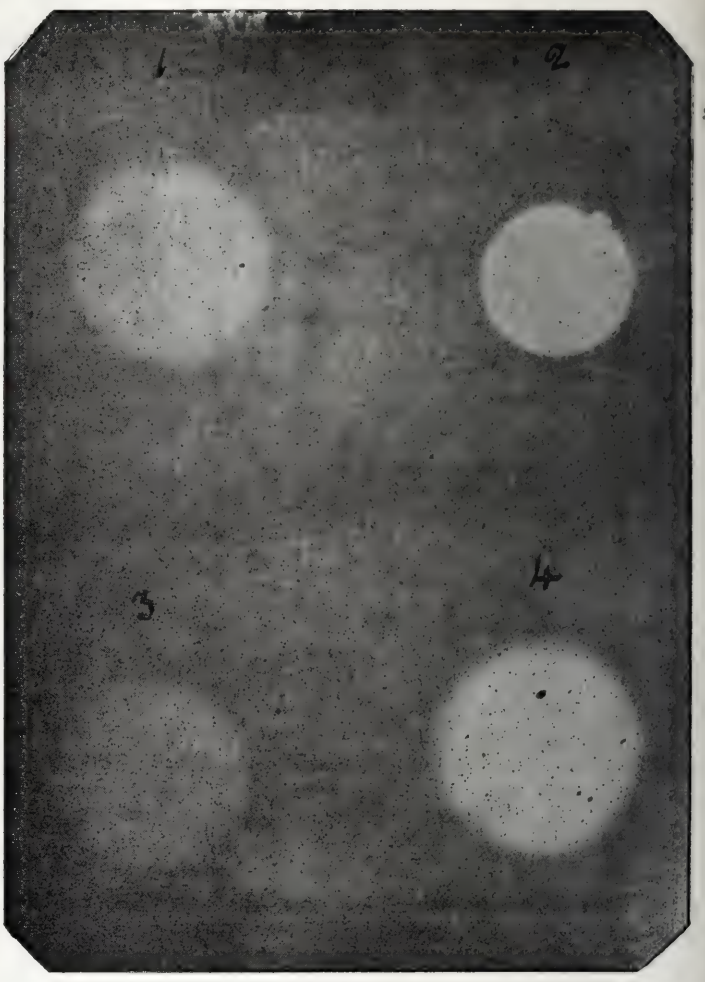
The following simple experiments will be found to yield interesting results, and may perhaps excite the curiosity of the photographer to pursue his investigations further. From a dealer in minerals and fossils procure a piece of pitchblende, with one of its surfaces, if possible, cut flat and polished. In the dark room place the polished or flat surface of the pitchblende against the sensitive surface of a photographic plate, and enclose both in a light-tight box. Allow the pitchblende to remain in total darkness, in contact with the photographic plate, from twenty-four to forty-eight hours, and, at the end of that time, develop the plate in the ordinary way. On examining the resulting negative, the structure of the mineral will be found to be clearly shown, those portions having no radio-activity, such as the pyrites, quartz, and felspar, showing as transparent patches, while every particle of pitchblende will show up black, the less intensely radio-active portions being rendered in half-tones on the plate. Crystals of orangite or any specimens from the list of radio-



Radiograph impressed in the dark, of the same surface as seen in the photograph. A thick piece of black paper was interposed between the specimen and the film of the plate.

active minerals given above, if treated in the same manner as the pitchblende, will yield interesting radiographs. It is as well to interpose a sheet of black paper between the specimen and the film of the plate, to prevent scratches or other blemishes. The paper in no way interferes with the action of the rays on the plate.

On to a sheet of glass 5×4, cement four cells about half to three-quarters of an inch deep, made out of a piece of ordinary lead-pipe one inch in diameter. Into cell No. 1 place 30 grains of commercial uranium nitrate. Heat 30 grains from the same sample of uranium nitrate to 230° C. until it commences to decompose; and when cool, place it in a cell No. 2. Take another 30 grains of the uranium, and subject it to a greater heat, until half the nitrate has decomposed; and when it has cooled, place it in cell No. 3. Into cell No. 4, place another 30 grains of the uranium nitrate which has been heated until decomposition has been completed. In the dark-room place *one* photographic plate with its sensitive surface in contact with the glass plate carrying the cells containing the commercial uranium nitrate; and place another photographic plate with its sensitive surface in contact with the mouths of the four cells. Let the two plates remain in total darkness, exposed to the action of the uranium nitrate, for forty-eight hours, and then develop them, when four radiographic images, each slightly differing in gradation, will appear on each plate. Various substances, such as celluloid, black, brown, or white paper, &c., may be interposed between the photographic plate and the uranium nitrate, but they will be found to have little or no effect on the strength of the resulting image.



Radiograph of commercial Uranium Nitrate.

Cell No. 1.—30 grains commercial uranium nitrate.
,, No. 2.—30 grains heated to 230° C. until decomposition commenced.
,, No. 3.—30 grains subjected to greater heat, until half the nitrate had decomposed.
,, No. 4.—30 grains heated until decomposition was completed.

In applying the radiographic test, it must always be borne in mind that the test is a cumulative one; that we are trying to obtain a photographic impression of that which the human eye cannot see, and which may be contained in the substance under investigation in almost infinitely small quantities. Because the first trials may yield no result, it is by no means a sign that the radio-active properties are not there; the negative result is far more likely to be due to insufficient exposure. Therefore have patience, and double, treble, or quadruple your exposures; if twelve hours will yield no result, try twenty-four, forty-eight, a week, or even a month, ere relinquishing the attempt.

F. Martin Duncan.

HINTS TO BEGINNERS IN LANTERN PROJECTION.

With the optical lantern forming a regular adjunct to all well-appointed photographic societies, Sunday schools, and literary associations, there are always those who feel animated with the desire to try their hand at the manipulation of a lantern, simply by reason of the fact that, because Mr. So-and-So appears to work it easily, they see no reason why they ought not to be able to do so as well, and so when the first opportunity arises they make their "début," and in nine cases out of ten find it a much more difficult operation than they imagined. Ardent lanternists, however, seldom knock under by

reason of a few failures when starting, and it is a good sign when a beginner is able to discern in what particular he has gone wrong, and forms a determination to do better next time. It is when working a lantern before an exacting public that a lanternist feels the responsibility that rests upon his efforts, for it is a very different matter to work a lamp before a Sunday school class, or even some private society, than to operate before the gaze of an audience who have paid for their entertainment. In the latter case there must be no semblance of failure, for a trifling hitch that would be thought nothing of before an audience such as a Sunday school class would not be tolerated by a paying public, and therefore all beginners should realise the importance of the position they are to occupy when undertaking to operate before the general public. One of the first essentials towards becoming an expert lanternist lies in the possession of what may be termed "nerve," and if any aspirant feels he cannot approach the work, i.e., the manipulating of high pressure cylinders, and also standing up before the gaze of a public audience without becoming shaky in the regions of his knees, and feeling nervous, almost to the extent of giddiness, he should confine his attentions to a private audience, and limit his apparatus to a good oil or gas lamp.

It is well known that there are a great many individuals who have a perfect horror of gas cylinders, and, although they are quite aware that, by reason of the very stringent restrictions imposed by the Board of Trade, such cylinders are absolutely safe, still, somehow or other, they never can be persuaded to sum up courage enough to manipulate the same. At the present time limelight projection is dependent upon compressed gas in cylinders, and all operators must be possessed of sufficient nerve to manipulate them with absolutely no fear. Possessed of sufficient nerve and confidence to do so, there is nothing to hinder any one with a fair amount of practice becoming an expert operator with the various grades of limelight projection, provided he follow closely a few well-recognised rules. It is hardly likely any one will attempt to work a lantern with limelight as the radiant without at some time or other having seen others do so, and, at least, picked up some idea of the work and the various parts of a lantern. so that being possessed of even a limited amount of knowledge in this respect, one of the first things a beginner would do well to acquire is a complete acquaintance with the manipulations of gas cylinders, so as to be able to make the necessary attachments between the cylinders and the jets, as well as becoming proficient in opening and closing the valves. It may appear strange, but it is a fact nevertheless, that many aspirants to limelight projection actually fail to turn the valve spindles in their proper course when opening or closing a cylinder. It should always be borne in mind that these spindles, in opening or turning on the gas, are moved from left to right when the operator is standing in front of or immediately opposite a cylinder, just as would be the case in extracting a screw nail by means of a screw-driver, for, let it be understood, that once the valve spindle of a gas cylinder is screwed completely home any further attempt by undue pressure to turn the same from right to left can only tend to fracture the spindle, and when this happens at the commencement of an entertainment, unless an experienced operator be present, or one who knows the only alternative method (which, by the way, no novice should attempt) of getting out the gas, he has no choice but to throw up the sponge, and inform the audience of his failure. True, cleverly designed keys are procurable whereby it becomes practically impossible for a novice to turn a spindle in the wrong direction, but these are not employed by experienced operators, and are not invariably sent out by opticians with the gas cylinders. What is needed is the merest practical experience of how to open the spindles of gas cylinders. This once acquired, a cool head, with the necessary nerve, will invariably carry this, in one sense, very important part of the operation through without any chance of failure. Being possessed of the necessary knowledge of how to manipulate a cylinder, the next factor of importance is a complete acquaintance with every detail of the apparatus that has to be put in use, and this is probably the most important of all the items connected with limelight work. Nothing new or untried should ever be taken for granted. Everything down to the minutest detail ought to be tested and looked upon as a necessary part of what may be termed one machine. Failures have arisen (in fact, are quite common) by the mere damage in transit to the nozzle of a cylinder, the regulators or taps not fitting the same just at the moment of requirement. This one item alone will go far to show how necessary it is for an operator to not only have the closest intimacy with his apparatus, but at the same time see beforehand that the nozzles of his cylinders have not been damaged in transit, and this is easily done by seeing his connections are working satisfactorily before he sets out, or at least in sufficient time to permit of any hitch being rectified.

Another very important factor lies in taking care to have plenty of time beforehand so that any little hitch (of which he will be certain to have some) can be easily seen to. It is one of the greatest mistakes to leave everything to the last train, or to depend upon others looking after things one ought to attend to themselves. It may surprise some of my readers to learn that such things as empty cylinders do exist, and that they have actually been sent instead of full ones in cases where an operator has depended upon others despatching his apparatus. The one golden rule is, "Take nothing for granted, and do everything yourself." This gives an operator an amount of confidence in approaching his work which amounts to a practical certainty of success. On the other hand, should he be ignorant of some important item such as not knowing of a certainty the amount of gas he has to rely upon, he will be in constant dread during the whole night that his entertainment may come to a sudden end, and a feeling such as this never conduces towards successful manipulation. Such are a few of the primary factors that a beginner would do well to closely observe. Turning to what may be termed more in detail, there comes to be considered the erection of the screen. This operation at times is very easily performed, but just as frequently gives no end of trouble. Speaking generally, all portable screens are now erected upon wooden or bamboo frames, and if a beginner makes a rule of becoming familiar with the several portions which go to make up the entire frame (no matter what its size be), the frame is very rapidly set up, and the sheet easily tied on, and then with medium and small sizes held in position on the crossbars or feet of the frame by the binding cords. At other times these crossbars are best dispensed with, and the frame held in the desired position by means of cords attached to suitable positions in front and behind the sheets. When these cords have to be used, care should be taken to attach them to the top corners of the frame before it is reared on end, or set up vertically. If this be omitted it is often difficult to reach to the top of the frame so as to make the cords fast to their corners. Screens should be carefully protected from dirt; there is nothing better than a waterproof bag, into which the sheet is, when carefully folded, slipped and buttoned up. The practice of folding a sheet in lengths and placing it uncovered into the box along with the poles which form the frame is a slovenly method of packing, and never fails contaminating the sheet with dirty fittings, etc., and a dirty sheet is an abomination. The screen being erected and drum-tight on the frame, a lanternist is free to devote his attention to the lamp. Knowing the focal length of the objective he intends to use, it is an easy matter to select, as near as possible, the proper position the lamp should occupy, and a beginner would do well to learn off by heart the simple rule which governs the working distance, size of disc, and focal length of objectives. This is quite easily grasped, and, once understood, an operator will never be in a difficulty to know exactly at what distance to place his lamp, or when face to face with the alternative of having to work from a fixed position, such as the front of a gallery, to know at once what focal length objective will suit his purpose best. Strange as it may appear to many, there is little doubt that much misconception exists regarding the jet most suitable for a beginner to adopt. What is termed a blow-through form is almost invariably selected, no doubt because there is an idea that this form of jet is absolutely safe. This idea was no doubt engendered many years ago, when gas-bags were in use. With high pressure gas, however, in cylinders a mixing jet is as safe as a blow-through, and, as to the ease of manipulating, the one as against the other, the mixing jet is far and away to be preferred. A beginner would therefore do well to make a point of starting with a good pattern of mixing jet, feeling quite satisfied that when cylinders are used the safety is as great as there is any need for, whilst as to the ease of working there is no comparison. Having made up his mind to begin with a good from of mixing jet, the next item of importance is the aperture of its nipple. For a beginner this should not be greater than 1-22 or 1-25 of an inch; larger bores are more liable to give trouble; but with the former size of openings a very powerful light can be obtained with ease. When working off cylinders some operators prefer opening up the taps of their jets and regulating the flow, or prepare the gas by fine adjustment taps on the nozzles of the cylinder, but a beginner might not be able without practice to adjust his failing light, by reason of reduced pressure as the gases are consumed without blowing off his tubes or causing a roar at the jet. Therefore until he becomes proficient he should always work with good regulators on each cylinder. Having carefully screwed the regulators on the cylinders, and made

the tubes fast to them and to the proper tubes of the jet, the taps on the jet should not be opened. The gas from the hydrogen cylinder is first turned on very slightly. When this occurs, the moment the pressure of gas reaches the maximum at which the regulators are set to cut off, no further gas is allowed to be emitted from the cylinder, the automatic action of the regulator keeping the gas in check. A lime being inserted upon the lime pin of the jet, the hydrogen tap of the jet is slightly opened, and the gas lighted and the lime brought up to about a quarter of an inch from the nipple of the jet. The flame of the hydrogen will now be playing on the face of the lime, and the extent of flame should be regulated by means of the tap so as to just nicely heat the lime before any attempt is made to turn on the oxygen. After the hydrogen flame has heated the lime in every part the next step is to turn on the oxygen gas at the cylinder also, being very careful to see that the tap on the jet is closed, and not to turn the valve of the cylinder too far; only just about a quarter turn is often sufficient. A little more hydrogen may now be turned on, say, until the flame reaches a length of about two-and-a-half to three inches. This done, the oxygen is very slowly turned on by the tap of the jet. On no account must a rush of oxygen be sent suddenly forward in the jet. It should be very gently and slowly let in. When this is accomplished it will soon be evident that the two gases are beginning to commingle, and then by quietly admitting just a little more oxygen the light will brighten up until the full brilliancy is acquired, by gently manipulating both the gases, so as to bring the jet up to its full working capacity. By attending closely to the gentle admission of gas a beginner will never commit the error of snapping out his light.

Most modern jets of the mixing type are now supplied with fine adjustment taps. There is no doubt this is a distinct advance over the old form of thumb-tap, which did duty for so many years. By means of these fine adjustment taps the utmost nicety in adjustment of the gases can be acquired, and it will not be long before even a beginner will be impressed with their utility. When also the jet has a cut-off movement, as is generally the case with high-class apparatus, an operator has also much greater power in his hands for the manipulation of his light.

A. T. Newton.

EFFECT UPON THE PERSISTENCE OF VISION OF EXPOSING THE EYE TO LIGHT OF VARIOUS WAVE LENGTHS. *

[Reprinted from the "Physical Review."]

II.

Normal Persistency Curves.

The first persistency curve obtained was the normal. As this was the standard with which curves for abnormal conditions of the eye were to be compared, the readings were taken with great care to avoid all sources of error. The eye was allowed to rest in diffused daylight for more than ten minutes before each reading. The values of this series of settings are given in table I. They are also graphically

Table I.

Normal Curve.

Wave length.	Persistence.	Wave length.	Persistence.
·400 μ	·0308 sec.	·533 μ	·0126 sec.
·415 ,,	·0285 ,,	·573 ,,	·0120 ,,
·438 ,,	·0220 ,,	·620 ,,	·0124 ,,
·454 ,,	·0196 ,,	·678 ,,	·0140 ,,
·475 ,,	·0166 ,,	·758 ,,	·0179 ,,
·500 ,,	·0147 ,,		

shown in fig. 4, in which ordinates represent the persistence of vision for various parts of the spectrum in seconds, and abscissæ are wave lengths.

To guard against error, observations with the eye in its normal condition were frequently made to see if any change had taken place. A series of such settings taken towards the latter part of the investigation is given in table II. Their relation to corresponding readings upon the original normal curve is indicated by *X*'s in fig. 5. This curve, like the ones given by Nichols and by Ferry in the papers cited, shows that the persistence is least near the *D* line and increases towards both ends of the spectrum. The curves are parabolic in form.

* Continued from page 507.

Table II.

Supplementary normal settings.

Wave Length.	Persistence.	Wave Length.	Persistence.
·400 μ	·0308 sec.	·533 μ	·0128 sec.
·410 ,,	·0272 ,,	·620 ,,	·0120 ,,
·438 ,,	·0224 ,,	·715 ,,	·0152 ,,
·475 ,,	·0171 ,,	·758 ,,	·0183 ,,

It was accidentally noticed at one time during a series of observations, that the duration of visual impressions was increased when

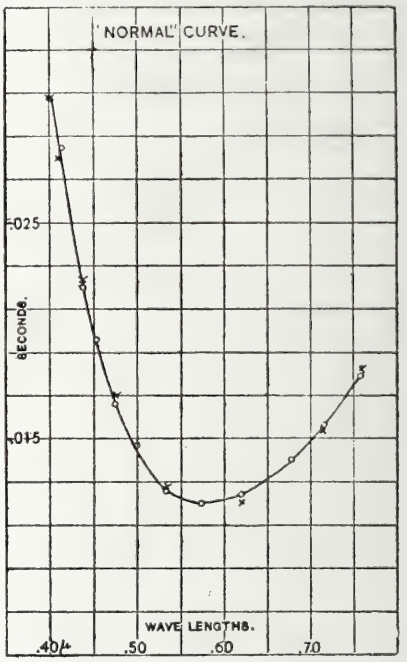


Fig. 4.

the eye had been resting in the dark. This phenomenon was thereupon studied in some detail. Before each observation the eye was allowed to rest in the dark room in which the experiments were being

Table III.

Persistence after exposure to varying degrees of light and darkness compared with "normal" persistence.[9]

	Persistence under various Conditions.			
	a Eye rested in dark room.	*b* Eye rested in total darkness.	*c* Eye blindfolded.	d^{10} Eye "normal" (exposed to diffuse daylight).
·400 μ	·0398 △	·0390	·0344	·0308
·410 ,,	———	·0355	·0323	———
·415 ,,	———	———	———	·0285
·438 ,,	———	·0284	·0257	·0220
·454 ,,	·0246	———	———	·0196
·475 ,,	———	·0185	·0187	·0166
·500 ,,	0172	———	———	·0147
·533 ,,	·0140	·0140	·0131	·0126
·573 ,,	·0132	·0130	———	·0120
·620 ,,	·0133	·0132	·0125	·0124
·678 ,,	0145	·0148	———	·0140
·715 ,,	·0171	———	———	———
·758 ,,	·0200	·0211 ▽	·0199 ▽	·0179 ▽

conducted. This room was not completely dark, as the walls could be dimly seen, owing to the stray light from the acetylene flame. The results are given in column *a* of table III. After coming out into the

[9] Arrows indicate the order in which settings were made.
[10] Repeated for convenience of comparison from table I.

ght, two of these readings were repeated, and the following values tained :—

Wave length.	Persistence.
·678 μ	·0132 sec.
·620 ,,	·0125 ,,

n comparing these with the values given in table III. (*a*) for the me wave lengths, the difference will be at once noticed.

It was thought that, as the walls of the dark room could be seen distinctly, the eye was subject to a strain which might be really tiguing it, and so increase the persistence of the colour impressions. he observations were accordingly repeated, this time with the pre-ution of resting the eye in total darkness. The results are given column *b* of table III.

These values are a little greater in the red than the corresponding nes in column *a*, but the two curves lie very close together, as will e seen by inspection of fig. 5, in which these curves are compared.

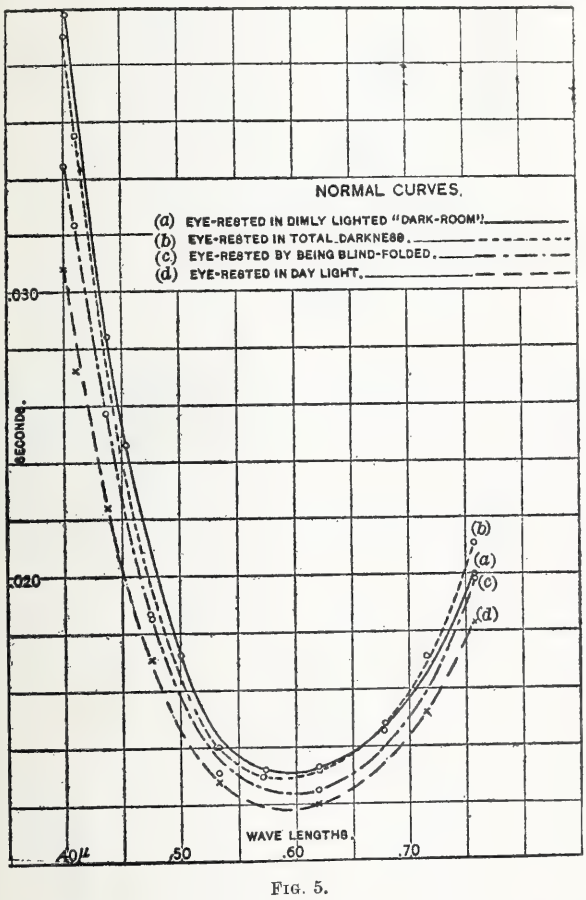


FIG. 5.

It is quite evident, therefore, that the increased sensitiveness of the retina in the dark increases the persistence of vision, which is just the opposite of the anticipated effect. The increase in the values of the persistence of different wave lengths is not uniform, being about 15 per cent. greater than the normal in the extreme red, 11 per cent. in the yellow, and 30 per cent. in the extreme violet. This result harmonises with a statement of Parinaud,[11] who found that "the increase in the sensitiveness for light which is produced on a retina placed in the dark, is not equal for rays of different refrangibility." He further states that this is true for all parts of the retina except the yellow spot. As the observations described in this paper extended at the same time over the yellow spot and surrounding portions of the retina, it is not possible to state conclusively whether the above statement is confirmed or not. The persistence of vision being a function of the sensitiveness of the retina as well as of the intensity of the light stimulus, connects what is found in the curves just described with the observation of the French writer.

In these last experiments the eye was kept open while being rested, and it was decided to further test the supposition that the increased values of the duration of the impressions might be due to the strain of adaptation of the retina, or to some kind of muscular strain. For this purpose the right eye, the one used in all these experiments, was rested by being closed and blindfolded. All muscular strain, at least, was removed in this way, and the results, in column *c*, table III., show that a different condition was induced in the eye.

These values, shown graphically with the others in fig. 5, are intermediate between what may be termed the ordinary and extraordinary normal curves. In this comparison it will be seen that the hypothesis that the great increase in the duration of the colour impressions is due to some kind of muscular strain is substantiated partially, since the elimination of that possible disturbing factor brought about a decrease in these values. There still remains a substantial increase which must be accounted for, the most obvious explanation being that it is due to the increased sensitiveness of the retina. This curve also shows that the increased sensitiveness of the retina is unequal for waves of different lengths, the increase above the normal being 9 per cent. in the red, 5 per cent. in the yellow, and 12 per cent. in the violet. These results may be looked at from another point of view. According to the Hering theory, the sensation, or rather the lack of sensation, black, has the power of assimilation of the white-black visual substance. The eye in its normal condition is under the mild influence of daylight, which would dissimilate this substance to a certain extent. Darkness, being the absence of any stimulus of the retina, permits the restoration of the white-black substance to its maximum sensitiveness. In case this is the explanation of the phenomenon, why should the restoration of this visual substance affect the various colours at all, and especially different colours in different degrees? Instead of the visual substances of the Hering theory being independent of each other, some connection must exist between them. Darkness cannot be held to assimilate simply the white-black substance, but also the red-green and yellow-blue. It would, at least, be supposed that if restoring the white-black substance did affect the others, that it would affect the red-green substance equally in both red and green, and similarly the yellow-blue substance. But the persistence of the red is increased 9 per cent., while the increase in the green is 13 per cent. The discrepancy is far greater in the other case, as the increase in the yellow is only 5 per cent., while in the blue it is 13 per cent. These facts can hardly be said to be in harmony with the theory in question. Similar objections cannot be urged against the Young-Helmholtz theory, since it does not group the colour sensations into pairs of opposites, nor does it limit the restoring power of perfect rest—darkness—to counteracting any specific stimulus of the retina.

We have found so far that the persistence of vision is a maximum for all colours when the eye is rested by being kept open in total darkness. The values fall to an intermediate position when the eye is rested by being blindfolded, and reach a minimum when the rest has been given in diffused daylight. It would be expected that a considerable degree of exhaustion of the retina would have an opposite effect to that we have been discussing. But the experiments now to be described show that the opposite is the case—that fatiguing the retina causes the duration of the colour impressions to increase again.

Effect of Fatiguing the Retina with Various Colours.

Retina fatigued with red.

The eye was fatigued, as described in the first part of this paper, by looking at an isolated portion of a brilliant arc spectrum for about five minutes, the process being repeated before every observation. The condition of the retina with the red sensation partially exhausted, approximates that of the naturally red-blind person.

In this process a band of colour about 2 mm. wide was used, the centre of which in the case of red had a wave length $\lambda = \cdot 680\ \mu$.

The results of the measurements of the duration of the various colour impressions upon the retina in this abnormal condition, are exhibited in table IV., and graphically in fig. 6, in comparison with the normal curve.

Comparing the two curves in fig. 6, it is seen that fatiguing the eye with red has the effect of increasing the persistence of that colour and also of about half of the orange, the remainder of the spectrum being unaffected in any way. The persistence of the red is increased by 8 per cent., while the increase in the same portion of the spectrum when the eye was blindfolded was 9 per cent., the two agreeing within the limits of experimental error. The Hering theory would certainly lead one to suppose that the green part of the curve

[11] M. H. Parinaud. De l'intensité lumineuse des couleurs spectrales. "Comp. Rendus," Vol. 99, 1884, p. 937.

would show some difference from the normal. A glance at the two curves, however, shows a perfect agreement between them. A

TABLE IV.

Eye fatigued with red ($\lambda = \cdot 680\ \mu$).

Wave length.	Persistence.	Wave length.	Persistence.
·400 μ	·0293 sec.	·533 μ	·0126 sec.
·410 ,,	·0292 ,,	·573 ,,	·0118 ,,
·425 ,,	·0265 ,,	·620 ,,	·0128 ,,
·438 ,,	·0230 ,,	·657 ,,	·0137 ,,
·454 ,,	·0194 ,,	·678 ,,	·0150 ,,
·475 ,,	·0172 ,,	·758 ,,	·0192 ,,
·500 ,,	·0143 ,,		

similar lack of accordance of the experimental data with the anticipations of the Hering theory will be frequently noticed in the remainder of this paper.

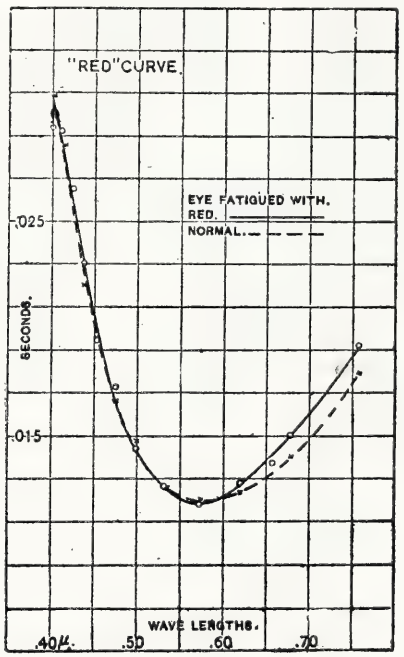


FIG. 6

It is to be noticed that the red sensation can be exhausted without affecting in any way the remaining sensations. This was a matter of some surprise; for upon looking at the acetylene spectrum after tiring the eye with red of the much more brilliant arc spectrum, all colours were apparently equally affected. The measurements showed that in this the eye was deceived. This confirms the statement of Burch in the paper previously cited, who, however, much more completely exhausted the colour sensations than the author of this paper.

Retina fatigued with green.

The measurements in this case were made in the manner already described, but with the retina fatigued by a pure green light from the arc spectrum ($\lambda = \cdot 520\ \mu$). The results are given in table V., and graphically in fig. 7.

TABLE V.

Eye fatigued with green ($\lambda = \cdot 520\ \mu$).

Wave length.	Persistence.	Wave length.	Persistence.
·400 μ	·0311 sec.	·512 μ	·0150 sec.
·415 ,,	·0253 ,,	·533 ,,	·0126 ,,
·438 ,,	·0206 ,,	·573 ,,	·0120 ,,
·460 ,,	·0187 ,,	·620 ,,	·0125 ,,
·475 ,,	·0176 ,,	·678 ,,	·0137 ,,
·492 ,,	·0164 ,,	·758 ,,	·0185 ,,

This curve shows an elevation or bunch in the green indicating, as before, an increase of the persistence in that part of the spectrum, due to the tiring process. The maximum increase of the persistence of the green is about 12 per cent., which again coincides with the increase in the persistence of the same wave length when the eye was blindfolded. The curve coincides with the normal in the

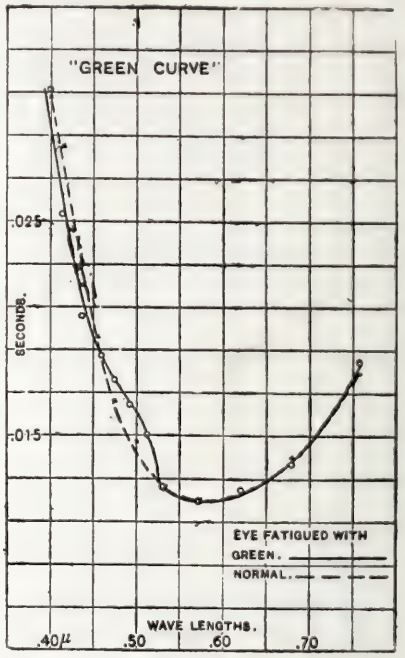


FIG. 7.

yellow and red, but runs under it in the blue and violet. The Hering theory would lead us to expect the curves to differ in the red; the Young-Helmholtz in both violet and red if they differed at all. For if one sensation were exhausted it is possible that the intensity of the remaining sensations might be increased, producing the effect noticed in the blue and violet, and a similar effect in the red. The same phenomenon will be noticed in two other curves (see figs. 8 and 9), though since it is but slight it may be due entirely to experimental errors.

Retina fatigued with violet.

The following values were obtained when the eye was fatigued with violet:—

TABLE VI.

Eye fatigued with violet ($\lambda = \cdot 400\ \mu$).

Wave length.	Persistence.	Wave length.	Persistence.
·403 μ	·0350 sec.	·502 μ	·0122 sec.
·410 ,,	·0287 ,,	·533 ,,	0110 ,,
·423 ,,	0227 ,,	·596 ,,	·0109 ,,
·434 ,,	·0198 ,,	·657 ,,	·0125 ,,
·443 ,,	·0188 ,,	·715 ,,	·0149 ,,
·454 ,,	·0161 ,,	·758 ,,	·0176 ,,
·468 ,,	·0149 ,,		

The data are plotted in fig. 8 in comparison with the normal curve. The only part of the curve affected is the violet, which shows results similar to those obtained in the two preceding curves. There is an almost complete coincidence of the curves from the blue to the middle of the red, the fatigue curve then falling a little below the normal. This illustrates the remarks made upon a similar effect obtained in the abnormal curve for green. The persistence of the violet is increased by 27 per cent. These three curves for the eye tired with *red*, *green* and *violet* respectively, are of the same type, having one elevation which occurs in the part of the curve corresponding to the fatiguing colour.

It would be quite natural to expect, in view of the results already discussed, that if blue and yellow are fundamental sensations in the same sense as are red and green, according to either of the two most widely accepted colour theories, similar elevations of the curve would be produced by using blue and yellow, respectively, as fatiguing stimuli, and these elevations would occur in the corresponding parts of the curves. In other words if blue and yellow are fundamental sensations, fatiguing the retina with these colours ought to affect

these colour sensations, and no others. On the other hand, if blue and yellow are not fundamental, but compounded of two other sensations, then fatiguing with one of these ought not to show any effect in the part of the curve corresponding to that colour, but should cause the elevations in the curve in the parts of the spectrum corresponding to those fundamental sensations which are affected. The latter is found to be the case.

FRANK ALLEN.

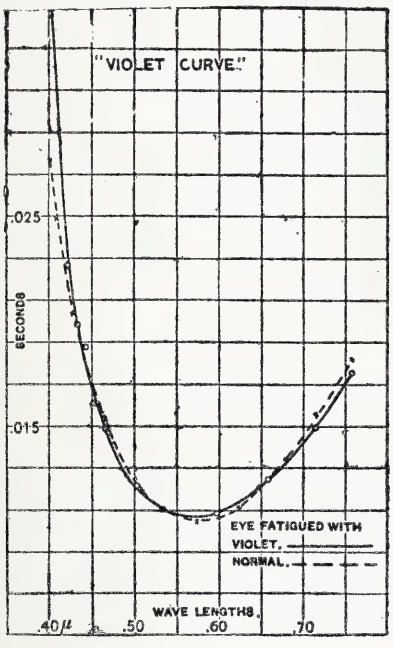


FIG. 8.

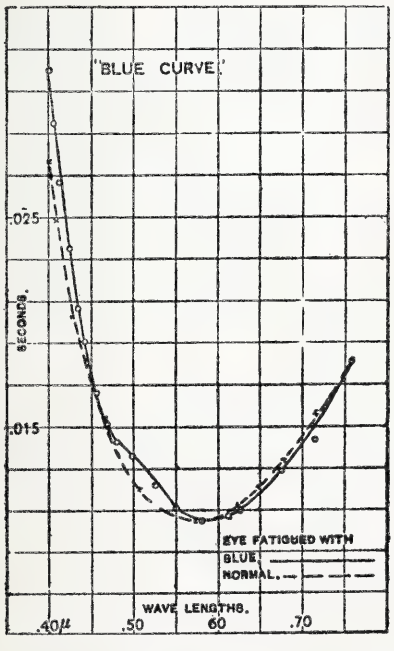


FIG. 9.

PHOTO-MICROGRAPHY WITH SIMPLE MEANS.

WORKERS with limited means are often tempted to make attempts at photo-micrography, but are appalled by the number of fittings that are usually specified as necessary. It has to be borne in mind that it is not every one who is bent on performing feats of resolution of diatoms or working with high powers, says M. J. Cross in "Knowledge." In making observations there are numerous enthusiastic amateurs, who, seeing a striking feature in an object, wish to record the appearance by photographing it for future reference, or for the edification of friends. The bulk of such work would lie within the scope of 1 in. or ½ in. objectives, and many of the ordinary fittings of complete photo-micrographic cameras are not really necessary, however desirable they may be. What is the simplest apparatus that can be used? Being provided with a microscope and bull's-eye, the additional apparatus would consist of an oil lamp, some form of camera, a support that will carry the camera at the axis height of the microscope when set horizontally, and a tube to connect the front of the camera with the body of the microscope. (1) The Lamp.—This need not be of an expensive kind such as is ordinarily supplied for microscopical work. One with a tin frame which is purchasable at an oil shop for 1s. answers very well. (2) The Camera.—This should not have less than 10 in. of extension, and requires to have a good dark slide with it. The focussing would, of course, be done by means of the microscope adjustments. (3) The connecting tube might be of cardboard or of brass as preferred. (4) A support for the Camera.—This is really of great importance in an arrangement of this description. It would be well that a frame should be shaped up by a carpenter to which the camera could be attached, and on which, at a suitable level, the microscope and lamp could be placed in a fixed central position. A knowledge of photography is so general that it is hardly necessary to say that an acquaintance with developing, printing, &c., is desirable; but with such contrivances as those named, carefully arranged, really good results can be secured with low-power objective. Success under such circumstances will lead to a desire to attempt more pretentious work with better apparatus. Photo-micrography has a charm of its own, but in order to attain proficiency it is essential that the worker possess a good practical acquaintance with microscopical manipulation and ordinary photography. The failures that are so frequently met with are due, in the majority of instances, to ignorance of one or both subjects; in fact, the writer has met with people who have essayed to do photo-micrography without previous serious work with the microscope or knowledge of its limitations. A serious practical man can succeed with elementary arrangements where a novice with the best equipment of apparatus would fail.

FLASH-LIGHT POWDERS.

[Reprinted from the American "Photographic Times."]

WHEN collodion plates were used, and before the more rapid dry plates were made, the photographer who wished to do quick work required the most rapid lenses. The portrait lens resulted from this demand. It still finds use in gallery work, not because such quick action is now necessary, but because of other qualities not found in the lenses most favoured for general amateur work.

Nevertheless, very quick exposures were made in the days of collodion, of very high sensitiveness far beyond what is commonly supposed to be practicable, and early experimenters made instantaneous exposures in daylight which compare very favourably with similar efforts of the present time. It is not surprising, therefore, to learn that the flash-light was used in photography a quarter of a century ago. About the year 1865, according to a writer in the "Photographic Times,"[1] the following compound was recommended for lighting a subject during eight or ten seconds:—

Sulphide of antimony	12 parts.
Sulphur	42 ,,
Nitrate of potash	112 ,,

This compound, it was stated, had been in use for twenty years.

As early as 1865[2] Mr. J. Traill Taylor, who, up to the time of his death, was an indefatigable and skilful experimenter in photography, used a compound of sulphide of antimony, nitrate of potash, sulphur and magnesium filings, for making almost instantaneous exposures. In a later communication[3] Mr. Taylor states that potassic chlorate was used in his mixture to replace the nitrate.

With this mixture and collodion plates he photographed an engraving while it was being moved, children at play, and other subjects. He also devised a holder for ensuring the instantaneous ignition of the mixture.

For a long time we heard nothing about flash-lights but early in 1887 Messrs. Gaedicke and Miethe, of Berlin, prepared a quick-burning mixture of strong actinic power, with which they photographed a room of large size at midnight. The mixture was said to burn in one-fortieth of a second. This experiment was described by Dr. H. W. Vogel in "Anthony's Bulletin," xviii. (1887), p. 327, but the composition of the mixture was not then made known.

1 Vol. xvii. (1887), 592.
2 THE BRITISH JOURNAL OF PHOTOGRAPHY, 1865, 587. "Photographic Times," xviii (1887), 575.
3 THE BRITISH JOURNAL OF PHOTOGRAPHY, 1867, 245.

In a later communication to the "Bulletin," page 387, Dr. Vogel again refers to the subject. His letter is dated June, 1887, and he states that Messrs. Gaedicke and Miethe had exhibited at a meeting of the Berlin Photographic Society, three months before, some pictures which were evidently taken instantaneously with artificial light, but by a process not made known.

Dr. Vogel, jun., imitated the mixture, and photographed a room 42 ft. deep, by burning three grammes of magnesium powder. He also photographed a group of six persons with one gramme of magnesium powder mixed with chlorate. The mixture used by Dr. Vogel was:—

Magnesium	30	grammes.
Antimony sulphide	10	,,
Potassic chlorate	60	,,

The suggestion was made, in Dr. Vogel's article, of adding soda and strontia to the mixture in photographing oil paintings, to get correct colour tones.

A comparison of the intensity of the light obtained by burning 5, 10, and 15 grammes of the mixture with that of direct sunlight is given, but it seems of doubtful value for any practical purpose. The result indicates that ten grammes of the magnesium mixture at a distance of one metre is five times stronger than sunlight.

About this time it was proposed to utilise the flash-light for the automatic detection of the wicked people who go about at nights and break into people's houses. A certain Dr. Hitzman is responsible for this interesting suggestion. A camera is provided with a charge of the powder and an instantaneous exposing apparatus, connected with the door or window by electricity. Then, at the proper moment, when the robbers are well posed for their pictures, the current sets the magnesium on fire and opens the shutter! "Every house should be provided with this private detective apparatus." &c. It is also useful to catch garden thieves. It is said that a farmer did in this way photograph a thief who was climbing a ladder to a fruit tree, the ladder being in the circuit. It was considerate in the farmer to provide a properly wired ladder for the convenience of the predatory visitor.

A writer in THE BRITISH JOURNAL OF PHOTOGRAPHY, xxxiv. (1887), page 539, gives a summary of the original communication of Gaedicke and Miethe, taken from "Photographische Mittheilungen."

The composition of the Gaedicke and Miethe "Blitzpulver" was as follows:—

Magnesium powder	3	parts.
Antimony sulphide	1	,,
Potassic chlorate	6	,,

Dr. Henry G. Piffard[4] devised a magnesium mixture, which he described at a meeting of the Society of Amateur Photographers of New York City, October 11, 1887. He used a mixture of one part of gunpowder and three of magnesium, and declared that this gave an extremely actinic light, and that the mixture was quite safe. He tells of making several negatives by the flash of a pistol charged with the magnesium mixture.

Another method of the same author is to sprinkle 10-15 grains of magnesium upon 7-8 grains of guncotton. This spreads the light over a larger space than the powder alone would cover.

Mr. T. W. Harvey[5] advises the use of a mixture composed of

Potassic chlorate	2	parts.
Sugar	1	part.
Magnesium	1	,,

In a later communication[6] he gives a few particulars about the effect of varying the proportion of sugar, &c., which are not very satisfactory.

Mr. A. P. Howard[7] states that he used the above sugar mixture, and found his negative under-exposed, but, repeating the experiment without the sugar, he made a full exposure. The light is less white and clear when sugar is used.

Among the numerous devices for igniting magnesium powder by blowing it into a flame, the first seems to have been described by Mr. T. N. Armstrong,[8] but Mr. Hugh Reid, of Glasgow, claims to have originated the idea. The ordinary lamp flame was first used, but soon Mr. W. Bishop adopted an alcohol lamp, with a flat top and two wicks, across which the powder was blown.

C. E. Southen[9] recommends a mixture composed as follows:—

Guncotton	8	grains.
Potassic chlorate	3	,,
Potassic permanganate	2	,,
Magnesium	20	,,

Dr. Vogel[10] alludes to a mixture by Dr. Olchim, the composition of which is unknown to him, which is "twice as sensitive as the Gaedicke-Miethe mixture, and produces no fumes."

P. Duchochois[11] recommends the following mixture:—

Guncotton	12	grains.
Magnesium	12	,,
Chlorate	5	,,

On the occasion of the New York Press Club dinner, at Delmonico's, New York, Mr. W. I. Lincoln Adams and Professor Charles Ehrmann[12] took a photograph, using three drachms of Carbutt's magnesium mixture of a Morrison wide-angle instantaneous lens, 6½×8½ camera, Cramer's No. 40 plate. Over 200 persons were present.

A mixture, not of the instantaneous kind, but which is said to give a very intense light, visible for one hundred kilometres, is made as follows:—

Magnesium powder	20	parts.
Barium nitrate	30	,,
Flowers of sulphur	8	,,
Beef tallow	7	,,

The tallow is melted and added to the mixed powders, and the mass sifted and poured into strong zinc cylinders 10 cm. long by 7 cm. in diameter. It burns twenty seconds, and gives a light of 20,000 candle-power.[13]

My own first experiments were made in 1888 while I was living in Japan. Some magnesium powder was procured from Germany, but it was rather in the form of irregular filings, large and small, mixed. When it was mixed with chlorate and ignited there was a fine pyrotechnic display, the larger particles flying in all directions like balls of fire. They would occasionally cross the field of view with disastrous effect on the negatives.

I was at that time studying caves and burial mounds, and made considerable use of the flash-light under ground. In the course of my travels among the Ainos I used it to get views of the interior of their dark and smoked-begrimed dwellings. Later, in India, the flash illumined the great stone columns and carved figures in the rock caves of Elephanti.

One of my first experiences with it was in the old Buddhist temple of Horiuji in Yamato, Japan, where I photographed some of the ancient mural paintings. But a single carefully arranged flash among the wooden idols of a building that had stood for a thousand years was all I dared to venture. A stray spark might kindle a blaze that would destroy all the temple buildings, and cause irreparable loss in objects of great value to history and early art. Therefore I constructed a box about one foot square, with three sides of glass and a back of wood, in which was a support for the magnesium mixture. Through an aperture in the back I was able to ignite the powder, and safety was thus assured. This lantern was so made that it could readily be knocked down and folded flat for easy transportation in a jinrickisha. With this arrangement several photographs were made at the temple, and I found it very useful for house interiors, as it prevented the smoke from spreading through a room.

The formulas herein given are but a few among many which have been proposed. A complete record of them would not serve any practical purpose. Some of the later formulæ have been given by the present writer in an article on flash-light powders published in the "International Annual," vol. x. (1897-8), p. 17. Among these is the formula adopted by the writer after numerous experiments and comparative tests. The composition of the quickest and most actinic mixture, which also burns with the least production of fume, according to the results of these experiments, is as follows:—

First prepare an intimate mixture of:—

Aluminium powder	2	parts.
Magnesium	1	part.

Then take:

Aluminium and magnesium mixture	10	parts.
Potassic chlorate	5	,,
Potassic permanganate	1	part.

ROMYN HITCHCOCK.

It is with regret that we have to announce the death on the 28th ult. of Dr. Ernst Vogel, son of the late Professor Dr. H. W. Vogel. Dr. E. Vogel succeeded his father in the editorial chair of the "Photographische Mittheilungen." He was also the author of an elementary text-book on photography, which was translated into English. Unlike his father, who directed his attention principally to the scientific side of photography, Dr. Ernst Vogel turned his talents to the technical and commercial side, and was one of the founders of the well-known reproduction firm of George Büxenstein and Co., one of the first firms in Germany to turn out commercially three-colour printing.

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4 "Anthony's Bulletin," xviii. (1887), 610, 646.
5 "Anthony's Bulletin" xviii. (1887), 659.
6 Loc. cit., 682.
7 Loc. cit., 730.
8 THE BRITISH JOURNAL OF PHOTOGRAPHY, xxxv. (1888), 2.
9 "Anthony's Bulletin," xix. (1888), 105-6.
10 Loc. cit., 99.
11 "Anthony's Bulletin," xix. (1888), 30.
12 "Photographic Times," xviii. (1888), 116.
13 THE BRITISH JOURNAL OF PHOTOGRAPHY, xxxvi. (1889), 175.

MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

To the "British Journal of Photography." *October* 4, 1901.

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PHOTO-MICROGRAPHY WITH THE POLARISCOPE.

One of the most interesting, and at the same time most neglected, branches of photo-micrography is its application to the production of photographs with the aid of the polariscope. Although every year the popularity of photo-micrography steadily advances, and with it an encouraging increase in the number of earnest workers, yet I doubt very much if one photo-micrographer in one hundred would be found to have devoted much time or attention to what I may term "polariscopic photo-micrography." Considering the comparative ease with which both striking and beautiful results can be obtained, this is all the more surprising.

Probably this neglect is in many instances due to the non-possession of a polariscope, for that instrument is no longer considered the very necessary adjunct to the microscopist's outfit that it was a few years ago. There are fashions in microscopy, as there are in dress, and just now the polariscope is somewhat out of fashion.

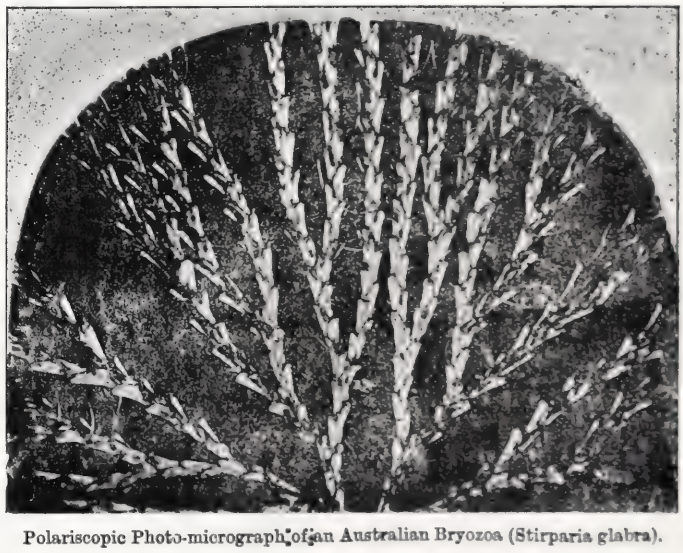
Polariscopic photo-micrography essentially belongs to low and medium-power work, the best results being obtained with the 1½ inch, 1 inch, and ½ inch objectives, and the Nos. 1 and 2 eye-pieces. Higher magnifications, owing to the great loss of light, rarely give such satisfactory results. The greatest difficulty to be surmounted is to find the correct exposure to give the plate. The gorgeous display of colour—the masses of vivid red, golden yellows, and violets—is very apt at first to deceive the eye, and lead to considerable under-exposure of the negative. But if it is always borne in mind that by polarisation much light is lost, and that every angle of rotation of the prism on its axis still further varies the amount of light which falls upon the plate, there will not be very many failures.

And now a word or two as to objects suitable for polariscopic photo-micrography; they will be found to be far more numerous and easily obtainable than is generally supposed. The wing-cases and middle leg of the Great Water Beetle (*dytiscus*), or the leg of a cock-roach are very pretty objects; and a thin section of a corn, finger or toe-nail, cow's horn, horse's hoof, &c., give very nice results. But to my mind the most beautiful objects for this work are the carefully prepared and dried polyparies of the bryozoa and compound hydrozoa. Indeed, it is the method, *par excellence*, for displaying to full advantage and successfully photographing the beauties of these delicate and graceful objects. Plant and animal hairs, starches, and raphides also lend themselves to polariscopic effects.

A visit to the dark-room will yield many beautiful objects, such as crystals of pyrogallic acid, citric acid, and borax; indeed, there is practically an inexhaustible supply to be drawn from chemica crystals, exquisite forms being obtainable by the combination and recrystallisation of various chemical salts. Such slides the photo-micrographer can, with a little practice, easily prepare for himself; the crystals once formed on cover-glass or slip may be mounted, either dry, in Canada balsam, or, in a few cases, in castor oil.

The beautiful discs of salicin are prepared by placing on a glass slip a drop of a concentrated aqueous solution, and evaporating it over the flame of a spirit lamp until fusion just commences; a drop of Canada balsam dissolved in xylol is then applied, and a warmed cover-glass gently lowered from one side, so as to drive out the superfluous balsam in an even wave.

The prismatic crystals of magnesium platino-cyanide, arranged in delicate rosettes, are obtained by evaporating slowly in a cool room a few drops of an alcoholic solution on the glass slip. If any attempt be made to evaporate from the alcoholic solution rapidly, or by the application of heat, the desired result will not be obtained. Octahedron crystals of strychnine may be obtained from a dilute alcoholic solution; a combination of a solution of picric acid and strychnine giving curious hook-shaped crystals. Beautiful crystals, resembling in shape the fronds of ferns, can be prepared by spreading evenly on a glass slip a small quantity of a solution of sulphate of iron.



Polariscopic Photo-micrograph of an Australian Bryozoa (Stirparia glabra).

A very remarkable series of crystallisations may be produced by allowing crystals of hippuric acid to grow under various conditions, such as in a a dry atmosphere, a moist atmosphere, and while exposed to the vapour of alcohol, ammonia, benzole, and sulphurous fumes.

Other useful chemicals are bitartrate of potash, menthol, salicylic acid, sulphate of copper, chloride of barium, and quinidine. Slides of these crystals can be made from a strong solution in distilled water. If a little gelatine be added to the solution, larger and more beautiful crystals will frequently be obtained. Where it is necessary

to mount in castor oil, the crystals should be evaporated on the cover-glass, a shallow ring of varnish run on the glass slip, and, when nearly dry, filled with castor oil; the prepared cover-glass carefully lowered into position, and pressed into contact with the cement; a final ring of varnish being run round the edge of the cover-glass to secure it, and prevent any possibility of leakage.

It is almost needless to state that in polariscopic photomicrography, the use of isochromatic plates is imperative. For most objects, Edwards' medium and instantaneous isochromatic plates have yielded excellent results, both with and without the use of the screen. For special work, where one colour predominates over all others, a plate sensitive to that particular colour should be employed, if the finest results are to be obtained. In such cases, Lumiere's Orthochromatic "A" and "B," or Panchromatic "C" plates will prove very useful, but they require careful manipulation, as they are very sensitive. They should, if possible, be developed by time, or at any rate examined as little as possible, and a cover kept on the dish during development.

It is better to err on the side of over, rather than under exposure, and the production of a strong, hard negative, full of bold contrasts, should be aimed at in development. F. Martin Duncan.

PHOTOGRAPHING DIATOMS.

[Reprinted from the "Journal of Applied Microscopy."]

In photographing diatoms at the University of Iowa the apparatus used is of the simplest character. It consists primarily of a "Practical" photomicrographic camera, a microscope furnished with a mechanical stage, apochromatic lenses, and with compensating and projection eyepieces. The remainder of the apparatus is mostly home-made, and consists of a table, condensing lenses suitably disposed, an acetylene generator, and simple lamp or burner.

The camera is hinged so that it may be used in either a vertical or horizontal position. I find this very convenient, as the bellows may be quickly raised to allow the operator to make a direct examination of the object. The working lens is a dry apochromatic, 3 mm. of ·95 N.A. A compensating eyepiece No. 8 and a projecting eyepiece No. 4 are the oculars used. The table, which serves the purpose at once of camera table and optical bench, is about three feet six inches long. The width is about sixteen inches and the height so adjusted that when the operator sits in a chair the ocular is in a convenient position for observation.

When making an exposure the bellows is turned down and rests on the leaf of the table, which for this purpose is raised to a horizontal position.

The condenser is composed of two plano-convex lenses two and one-half inches in diameter, an achromatic pair two and one-fourth inches in diameter, and a one-inch negative to effect the parallelism of the rays. The spherical and chromatic aberration of the first system of condensers is in a large measure corrected by this simple device; and, although it is conceded that every additional lens is in a sense an added obstacle, nevertheless the advantage to be derived from the introduction of the negative in the series at this point will quickly become apparent to any one who chooses to try the experiment.

No heat filter is necessary with acetylene gas as the illuminant. As is well known, this light is remarkably cool. The substage condenser is a plain uncorrected Abbe.

A small acetylene generator and a *round flame* burner complete the outfit. I have adopted the round flame burner after a series of experiments involving every other form of burner offered by the trade. I certainly consider it the most desirable and efficient.

In the present discussion I shall assume that the material to be photographed is properly mounted in well-cleaned styrax on cover-glasses of known thickness. For mounting the larger species a mechanical finger will be found convenient, as such species should be mounted singly. In photographing from spreads I proceed as follows: By the aid of the mechanical stage I carefully review the entire slide, noting the location of every suitable specimen of the species desired, of all species not yet photographed, and their degree of perfection. Such specimens should lie in optical contact with the lower side of the cover-glass, be clearly marked and free from foreign matter. These observations are recorded with the readings of the mechanical stage, and by use of the record at any subsequent time the desirable specimens may be turned to readily and photographed without loss of time. This search work may be done by daylight or, what I consider an exceedingly good substitute, by means of the acetylene lamp with a rather dense ray filter interposed. The filter, which has given me excellent results, is simply a flat eight-ounce bottle filled with a fluid composed of 175 grammes of copper sulphate, 17 grammes potassium bichromate, 2 c. c. sulphuric acid and 500 c. c. of water. The colour is restful and agreeable to the eyes, and the density is not sufficient to interfere in any serious way with accurate vision or inspection.

Focusing and adjusting for cover-glass thickness can be learned by experience only. As is well known, however, both arts are of the most vital importance. In this paper I shall not endeavour to give any advice on these two points except merely to mention a little matter that I have never seen elsewhere stated and which has been of great service to me. In my experience the microscope is always horizontal; this is the convenient position.

One day when working at the instrument I discovered that when I placed my fingers on the milled head of the fine adjustment screw, there ensued an alteration of the focus although the head had not been turned. Further investigation brought out the fact that the alteration was due to a springing of the arm induced by a downward pressure on the milled head, and that when the finger was removed the object came again into perfect focus. I also found that a slight pressure upward caused the object to pass out of focus in the opposite direction.

This proved to be an exceedingly delicate test of the correctness of the focus. If perfectly focused the error produced by this slight pressure is equal in both directions; but if not perfectly focused the error will be more evident in one direction than in the other. This apparently commonplace and trifling matter is well worth the attention of any one who attempts the photography of these very delicate and difficult forms.

The time of exposure will, of course, vary according to conditions. I use two different amplifications, 660 diameters and 1320 diameters. All my photographs are made at 660 diameters unless the objects are very small or are adorned with very fine striæ. When the forms are large and marked with fine striæ, two photographs are taken; one to show simply the outline, and the other at the higher magnification and with oblique illumination to show details.

The exposure is made as short as possible without sacrificing detail; then, if the plate be strongly developed the requisite contrast will be secured. I find, too, that it is best to make two exposures of each specimen.

On removing the plate from the holder a number is placed on one corner with a soft lead pencil, say Dixon's "Ultimatum," or one similar to it. This number is also placed in a book kept for the purpose with the name of the species, date, magnification, light, number of slide, and location. With these data it is an easy matter to re-photograph any particular specimen if at any time the negative be lost or broken, or if for any reason it prove unsatisfactory.

I have experimented with every developer to be had here, and have tested many formulæ, but none of them is equal to the one known as Bromo-hydroquinone. It gives the requisite amount of contrast, a thing to be kept constantly in mind in photographing objects so very hyaline as are diatoms.

For a fixing bath plain hypo seems to give better results than the acid alum bath.

Any good plate will answer the purpose providing it is *heavily coated;* my preference, however, is "Cramer's Instantaneous Isochromatic." Let me say again, a thin plate will not answer. In order to economise, I get the 4×5 plates and then cut them once or twice as the size of the diatom demands; *i.e.*, the plates are then $2\frac{1}{2} \times 2$, or $2\frac{1}{2} \times 4$. When dry they are put in appropriate envelopes,

filed away in alphabetical order, and a full record of each one is kept in a card index.

Most diatoms lend themselves readily to photography, the side of the valve which is most important usually being nearly plane. Some, however, are more or less convex or concave. Some species have ridges just inside the margin and a depressed centre. This, of course, necessitates a compromise, with some loss of detail, Only a very few species of the fresh-water forms, however, are impossible of photography as here described.

As is well known, Navicula is the typical genus of the Bacillariaceæ, with hundreds of species.

Previous to printing, the negative is placed in a retouching frame and the background is all cut out by the application on the back of a heavy coat of "Copelin's Opaque." This cuts out everything but the image desired. For printing, all sorts of paper have been tried. Among those I have used, of the developing sort, Velox, and of the printing sort, Solio, seem to give the best results. In printing on Velox, I proceed as follows: Six frames are prepared and arranged on the six sides of a hexagonal wire frame on which are stretched two thicknesses of white tissue paper.

This screen is about six inches in diameter, six inches deep, and open at the top. The printing frames are placed at irregular distances from the screen, according to the density of the plate in each case.

A bit of magnesium ribbon about one and one-half inches long is then ignited in an alcohol flame and instantly placed within the screen near the centre. This prints all six pictures at once and they are ready to be developed. The screen prevents the edge of the opaque from printing up as a sharp line. The use of the magnesium light greatly increases the rapidity with which the prints may be produced and also contributes not a little to the sharpness of the image.

Of course, with the simple appliances here described, the highest degree of critical photography may hardly be attempted. Nevertheless, illustrations may easily be secured, sufficiently accurate for practical purposes. No doubt a better apparatus is a thing to be desired. But, if the matter of expense must be taken into account at all, the apparatus which we have here described and successfully used will commend itself to many who might be prevented by the consideration of cost from attempting experiment in this most fascinating field of work. The results of our labours in this direction will form the subject of a descriptive paper presently to appear in the Bulletin of the Laboratories of Natural History of the State University of Iowa.

P. C. Myers.

University of Iowa.

REPORT OF THE INTERNATIONAL ASTRONOMICAL CONFERENCE HELD AT THE PARIS OBSERVATORY IN JULY, 1900.*

At the meeting of the International Permanent Committee held at Paris in 1896 regarding the photographic chart of the sky, it was decided by unanimous vote that another international astronomical conference should be held at the time of the World's Exposition. In conformity with this resolution and with the opinion expressed by the various members of the committee, the opening of the Congress took place on July 19.

The meeting of 1900 derived particular importance from circumstances. The question was not only to decide the measures to be taken to assure the definite success of the monumental enterprise already in course of execution during some half-score years, but also to attack one of the greatest problems of astronomy, whose solution, sought for more than a century by different methods, seems ripe for serious progress.

This problem, having for its object the determination of the mean distance of the sun from the earth, expressed as a function of the diameter of the terrestrial globe, or, in astronomical language, the determination of the solar parallax, is the fundamental element which enters into all the evaluations of the distances between the stars.

This new research, of such high importance, is susceptible of accomplishment either by direct measurement or by photographic, or by the two methods combined.

Thanks to the fortunate beginning of the Conference at Paris, the harmony necessary for the execution of such is to-day assured. About fifty observatories of the principal civilised counties are already at work, conforming to the general plan proposed by the Congress. The astronomers have also given to the world the beautiful spectacle of a united fraternity which it would be difficult to surpass. In this, moreover, they remain faithful to a tradition inaugurated far in the past by their predecessors.

We recall, indeed, that toward the end of the last century the visit of Lalande to the most celebrated Observatory of Germany, at Gotha, was the occasion of a meeting of astronomers of different countries. They entered into an agreement for the systematic observation of several celestial phenomena. Among all intellectual workers, we venture to affirm that astronomers can claim the glory of having been the first to lead the nations to join hands over the frontiers, to distribute among themselves methodically the tasks which would be too extended for the length of one human life, or for the strength of one nation alone. It is the privilege of our science, without doubt, from the nature and the grandeur of the problems which it proposes, to persuade men to join in the pursuit of a common ideal, not only for the moment, through the impulse of enthusiasm, but for prolonged and deliberate working together in harmony.

Construction of the Photographic Chart of the Sky.

Since the first international meeting held at Paris in 1887 when, thanks to the initiative of Admiral Mouchez, the photographic exploration of the heavens was decided, each year has been marked by sensible progress, and the realisation of this gigantic piece of work, the success of which at the beginning seemed doubtful even to men of broad intelligence, has become to-day not only a fortunate certainty, but all astronomers are of the opinion that the value and utility of this enterprise surpass all the hopes of its promoters.

This great photographic work, in which eighteen observatories of both hemispheres are co-labourers has, as we know, a double aim.

1. The formation of a general chart of the sky by the aid of photographs of long exposure; they have thus in view to obtain a representation of the actual state of the sky, comprising all the stars down to the fourteenth magnitude. This inventory of the celestial sphere, which will require twenty-two thousand and fifty-four plates, will permit a more thorough examination of the general structure of the sidereal universe. It will furnish a valuable reference in regard to the apparition and disappearance of stars, their variability and their motion as a whole in certain regions of space.

2. To make a series of plates of very short exposure based on the same number of negatives, containing the stellar images to the twelfth magnitude. This second photographic exploration of the sky is destined for the construction of a catalogue which will furnish accurate co-ordinates of two or three millions of stars. This work will serve as a basis for a very great number of researches of the highest precision. By means of these comparison stars it will be possible to determine the relative positions of all the other celestial bodies, especially comets and asteroids. We shall have, further, the possibility of determining with greater exactness and in a more complete manner the proper motions of the stars, and, through this, to acquire a more positive knowledge of the motion of translation of the solar system.

We see, by this short exposure, what a wide field of investigation and discovery is offered to astronomers of to-day, as well as to those of the future.

In any new research, whatever may be the theoretical value of the plan of execution established, *a priori*, the later realisation causes certain unforeseen difficulties to arise which must be remedied. We proceed inevitably through successive approximations to obtain the desired degree of perfection.

The various international congresses held at Paris from 1887 to

* From the "Annuaire pour l'an 1901, publié par le Bureau des Longitudes." Translated by F. E. Harpham.

1900 have had just this for a task, to better adjust conditions of work and overcome the obstacles to the chart.

For the chart proper, that which results from the negatives of long exposure, many astronomers have thought that the method first specified did not present all the guarantees necessary against frequent mistakes to which we are exposed in interpreting the results obtained, and, for example, would not permit us always to recognise with certainty on a chart plate the true image of a faint star. This situation has delayed for many years the execution of the first work, but the international conference of 1896 fortunately caused this uncertainty to disappear entirely in deciding that for the chart a series of plates should be made, each with three exposures. This solution, in effect, removes all doubt concerning the correspondence between the images and the stars photographed.

The French observatories have been the first to place in the hands of scientific men the chart plates executed on this plan. At the World's Exposition, in the section reserved by the Minister of Public Instruction, were three beautiful albums containing one hundred and seventy-seven of these charts. Each star is represented by three images forming a small triangle equilateral. It is thus impossible to confound a stellar image with spots resulting from impurities in the plate or from defects in the reproduction.

To give an idea of the wealth of these documents it will suffice to mention that on a great number of plates more than five thousand stars have been found.

In regard to the completion of the negatives for the photographic catalogue, considerable progress has been made, as has been shown by the information communicated at the last conference. By aid of the following table it will be seen that in many of the observatories the photographic work has been finished and in the others it is much advanced.

Observatories.	Zone in Declination.	Number of Photographs to be made.	Photographs obtained.
	° °		
Greenwich	+90 to +65	1149	1106
Rome	+64 to +55	1040	476
Catania	+54 to +47	1008	1008
Helsingfors	+46 to +40	1008	1008
Potsdam	+39 to +32	1232	1232
Oxford	+31 to +25	1180	736
Paris	+24 to +18	1260	1260
Bordeaux	+17 to +11	1260	402
Toulouse	+10 to + 5	1080	540
Algiers	+ 4 to − 2	1260	1260
San Fernando	− 3 to − 9	1260	1260
Tacubaya	−10 to −16	1260	746
Cape of Good Hope	−41 to −51	1512	1512
Sidney	−52 to −66	1400	1400
Melbourne	−65 to −90	1149	1149

We observe in this table the absence of three observatories upon which depended the completion of certain regions of the southern sky, but which, for various reasons, have found themselves unable to fulfil their pledges. One of the principal objects of the conference of 1900 was particularly to examine measures for filling these vacancies. The efforts of the conference seem destined to achieve complete success.

For one, owing to the liberality and generosity of the government of the Argentine Republic, a very valuable co-operation has even now been obtained, that of the National Observatory at Cordova, directed with so much renown by M. Thome; on another hand, the English astronomers have led us to hope for the concurrence of the Observatory of Perth (Western Australia), already equipped with all necessary instruments and which, for a participation in our work, lacks only financial ability, a matter of relatively small importance. The conference of Paris has asked its president to make an appeal to the minister of the English colonies to render effective the willingness of Mr. Cooke, the eminent director of the Observatory of Perth. We have a hope, not without foundation, that this application will result in success. Finally, the initiative of a distinguished *savant* of Uruguay, M. Enrique Legrand, a very zealous partisan of the photographic chart enterprise, has decided the executive power of that country to present to their chamber a project for the creation at Montevideo of an Observatory especially devoted to the chart of the sky.

Many other measures were adopted by the international conference of 1900 to improve, under certain conditions, the material execution of the work undertaken. They touch upon questions too technical for their exposition to find a place in this report. We must confine ourselves to saying that the result will be that the different parts of the common undertaking will advance together and their character as a whole will be as harmonious and perfect as possible. The astronomers who are collaborating in this enterprise have a right to be proud of their task which they are accomplishing, the importance of which seems to grow from day to day, and which promises results not yet apprehended.

To give but one example, recent researches now actually in progress prove that the chart properly so called, which will contain the images of almost thirty million stars, will render such service as we could hardly dare hope. Notwithstanding the blemishes always found in the paper of the charts, the intervention of the square *réseau*, which can be photographically transferred, renders us able to find the positions of this multitude of stars with a precision comparable to that given by meridian observations.

It would have been a rash project to attempt to reach such results by the process of direct observations. The united efforts of all the astronomers of the entire world during centuries would not suffice to carry to completion such an enterprise.

In casting a rapid glance over a past not yet distant, the mind finds itself impressed by the grandeur and fertility of the new methods, as well as by the phenomenal progress in all the domains of science during the latter half of the century. M. M. Loewy.

THE MECHANISM OF A SUNSET.

[Reprinted from "Knowledge" for October.]

Most people if they were asked to state the colour of the sun would say that it was orange, and they would as confidently assert that the colour of the atmosphere was blue. Recent researches and investigations, however, point to the conclusion that the real colour of the sun is blue, while that of the atmosphere surrounding the earth is orange. Commonly the earth's atmosphere appears so transparent and translucent that it is hard to realise the fact that it has as much effect on the light and heat coming from the sun as if it were a roof of thick glass. But the atmosphere is very far from being as colourless as it seems to be, and the best way of discovering its true tint is, not to gaze immediately overhead, but to look away towards the horizon. By so doing the atmosphere will be seen, as it were, in bulk; for overhead there is only a small accumulation of it compared with the many miles of thickness through which the vision travels when the eye looks towards the horizon.

The atmosphere surrounding the earth then may be likened to a screen of an orange colour, and it will readily be understood that any light passing through this screen will experience some remarkable modifications. Now, as already stated, it appears highly probable that, supposing any one could see the sun from a position outside the earth's atmosphere, the light coming from this central luminary would be seen to be not white, but blue. This blue is, of course, not a pure monochromatic blue, and the expression really means that it sums up the dominant note in the colour scheme. What, therefore, the atmosphere may be considered to do is to stop out, or absorb, all the colours at the blue end of the spectrum, the residue filtering through to the earth as white light. When the rays of light first left the sun, the blue rays were the strongest; but very soon after they entered the earth's atmosphere their progress was impeded, and of all the rays journeying from the sun they quickly became the weakest. On the other hand, the red rays, which at first were inconspicuous, had the facility of penetrating the earth's atmosphere, and were the most in evidence at the end of their long journey.

The first step, accordingly, to be taken when investigating a sunset

is to realise that the white light from the sun which is commonly supposed to be composed of the seven primary colours should rather be thought of as a residue of the original radiations. A further important point is to bear in mind that all radiations of light are of different wave-lengths. This fact, indeed, is at the very foundation, so to speak, of all sunsets, and it is the prime agency by which their flaming, gorgeous tints and colours are produced. It is due to this fact, for instance, that in the neighbourhood of large towns, the sun nearly always appears to set as a red ball of fire. The rays of light at the red end of the spectrum are of a much longer wave-length than any of their fellow rays, and so are the best qualified for penetrating the dense bank of haze which so commonly floats over all large towns and cities. In such localities, as the sun sinks to rest, the green rays are first absorbed by this bank of haze, and then the yellow, and lastly the orange and the red, the latter, more often than not, being the only ones to get through at all. A careful observation of a sunset will reveal the fact that the colours fade in the above-mentioned order, and the reason they do so is that they are of different wave-lengths.

In recent years the methods of observing the changes in the weather have been much improved, and since it is highly desirable that the observations should be capable of being compared with each other, the effort is made so to arrange that observations made at different places shall be conducted on a uniform plan. Now the colouring of a sunset gives much valuable information as regards the atmosphere in respect of the amount of moisture that may be floating in the air, that increased attention is being given every year to the work of observing and recording the quality of the sunset in various localities. The United States Weather Bureau, for instance, have in the principal streets of the large towns certain places where the latest weather reports and forecasts are displayed for the information of the public. In addition to this information there are also certain discs of various colours which are exposed in accordance with the colour of the latest sunset; and from this fact it will be gathered that the authorities attach a good deal of importance to information regarding the colour of the most recent sunset. It being clear, therefore, that sunset observations are of value, not only on the ground that they assist to a right understanding of the causes by which the sunsets are produced, but also because they are of use as aids to forecasting the weather, it becomes important that some systematic method should be devised for recording the observations, and it is satisfactory to know that a very simple way of registering sunsets has been adopted.

Supposing that any one should be desirous of keeping a record of the colour of the sunsets in his neighbourhood, a record it may be said that will afford considerable pleasure, especially during the autumn days, there is a very easy way of going to work. All that needs to be done is to divide the sunsets into classes after the following manner. There are in the first place those sunsets which may be described as clear, this definition being taken to mean that there were no clouds in the sky, and few brilliant colours, the colour predominating being red. Further, the term yellow is employed to describe the quality of the sunset when this colour unmistakably overwhelms all others. Green is a colour rarely seen in sunsets, but when it appears at all prominently it serves to define a third class of sunsets. Fourthly, there are those sunsets which are best described as cloudy, and in this variety there is commonly a dense barrier or bastion of cloud that completely absorbs all colour and effectively darkens the western sky.

At many of the observatories scattered throughout the world, not only are sunsets thus relegated to certain definite classes, but, in order to give the record a scientific value, still further particulars concerning the sunset are added. Thus the position of the colours as regards their position in the sky, or as regards altitude and azimuth, as the terms are, are observed; while the time at which the colours were seen and any increase or decrease in brilliance of the colouring would also be considered worthy of a place in the records. In all such systematic observations the time when the colours were at their brightest, and when they faded away, would be noted, and further, in order to make the record quite complete, the time of sunset or sunrise would also be registered.

Now, the colour in the sky may, as it were, be painted on the clouds, or on the hazy air, or on the open sky itself. As regards the latter the colour that is most conspicuous is, of course, the blue, and in seeking for the origin of this tint it will be found that the search leads to an explanation of many of the other colours. On looking up into the sky on a cloudless, sunny day, when the swallows, perhaps, are flying so high that they appear but as tiny specks in the dome of blue, it seems almost impossible to think of the atmosphere as being otherwise than perfectly clear and translucent. It is, however, in reality charged with minute dusty particles which have always been found in myriads, whenever the atmosphere has been tested either over the open sea or at the top of high mountains. There is an ingenious instrument, indeed, by which the number of these atoms of dust in any given quantity of air may be counted, and by its aid samples of air in many different parts of the world and at different seasons of the year have been analysed and the atoms counted. The sources from which this atmospheric dust is obtained are large. From the land, and more especially from deserts, dust is continually rising, and the dust so raised is carried by the winds to all parts. Spicules of salt, too, leap from the sea in myriads, and go to increase the stores of dust. Other sources of atmospheric dust are found in the stream of meteors which are continually plunging into the earth's atmosphere, their combustion also resulting in atmospheric dust. Volcanoes again are important distributors of dust. A cigarette smoker casts some 4,000,000,000 dusty atoms into the air at every puff; while the shaking of door mats and other similar operations constantly serve to launch a never-failing stream of dusty particles into the air. These particles of dust, it will be seen, are the agents principally responsible for tinting the atmosphere blue and for filtering out the gorgeous hues of a sunset.

In respect of these atoms of dust the atmosphere may be likened to some brobdingnagian vessel; for these atoms are always falling slowly downwards towards the earth like particles of chalk in a glass of water. As might therefore be expected, the lower strata of the atmosphere are most crowded and congested with these dusty loiterers, as is well illustrated when on a calm windless day these atoms settle downwards in such dense crowds and multitudes as to produce a dense black fog. But far above these lower levels the dusty atoms find their way, and since they are able to float so easily in these rarefied regions it is obvious that they must be of a lighter build and of more attenuated proportions than their relations which dwell where the air is dense. Even at these great heights there are ascensional currents of air which keep the tiny particles of dust floating. Although these particles are spoken of as dust, many of them are so minute that a microscope fails to render them visible, and the only way in which they reveal their presence is by their effects. Not only, therefore, do dusty particles pervade the atmosphere in all parts, but they vary in size from those that are coarse and readily discernible to others that are below microscopic sight.

Dusty atoms are further to be conceived as offering considerable resistance to the passage of the rays of light which emanate from the sun. Luminous bodies, as is well known, shed rays of light of varying wave-length, as the term is; and as regards human vision only those rays whose wave-length is between ·00036 and ·00075 millimetres can be seen. As these waves of light surge through the atmosphere, not only does their wave-length affect their manner of passing through the earth's atmosphere, but the different sizes of the dusty atoms against which the rays of light strike introduce other modifications. Thus, many atoms of dust are of a smaller dimension than the wave-lengths of light that rush in among them. Hence it happens that the red and orange rays which are of a large wave-length pass over these obstacles with comparative ease; but the blue rays which are of a shorter wave-length are stopped, and the blue light is, as it were, turned out of its course and scattered. Lord Rayleigh has suggested that it is to this selective scattering of the finer rays that the blue of the sky is due. This action has been illustrated by observing what happens when a bottle of soapy water is held up between the eye and a brilliant light. Seen thus the light has a yellow or an orange colour, but when the liquid is looked at sideways it appears blue, the rays that have been scattered being thus made visible. When looking up into the sky a similar thing happens, for

the blue tint is that which has been scattered from the sun-beams as they splashed, as it were, against the particles of dust suspended in the air.

In the lower strata of the atmosphere the coarser particles of dust not only scatter the waves of light, but they also reflect them, so that at these lower levels the blue tint is diluted by white light, and is accordingly not so intense as when seen, say, from the top of a high mountain. At this elevation only the finer varieties of dust are floating, and there is little reflection of the light, but much scattering, and hence it is here that the blue attains its greatest intensity. In that part of the sky nearest the sun the rays of light come in a direct line to the eye of the observer, and the scattering of the light does not appear so great as when one looks across the path of the beams, and it is due to this circumstance that the sky near the sun is not of so intense a blue as portions of the sky farther away. A similar kind of thing happens in respect of the clouds, where dust readily accumulates, and reflecting the light, produces their brilliant whiteness. At the edges of the clouds, moreover, the atoms of dust are busily engaged in refracting the beams of light, and to this cause is due that brilliant fringe of brightness which so often adorns many of the largest clouds. Not only, therefore, does the atmospheric dust filter out the blue light that tints the sky, but it also fabricates the pigments that colour the clouds, effects which can most readily be observed in contemplating the glories of the setting sun.

ARTHUR H. BELL.

AUTUMN IDYLLS: AND THEIR PICTURING.

GRANTED appropriate surroundings and the suitable frame of mind, there is oftentimes a rising above the usual earth level. A few take bold flight on the strong wings of fancy and imagination and soar into the blue; but they are very few. Most of us cannot go beyond the mountain top; still we should be thankful for the ability to go as high. Even there, and though it be for but a brief while, breathing the thinner, purer air does much good. With so much dull, commonplace action demanded in life for the privilege of living, it is agreeably refreshing as a contrast to have occasionally the opportunity of resting a while, and dreaming. At such a time, poetry with its rhythm, apt simile, and quaint word form, asserts its superiority in initiating, ministering to, and deepening the mind's more subtle spirit and tone. We are then of a thought and feeling with our noble poet, and see with him—

> "In the red West, through mountain clefts the dale
> . . . . far inland, and the yellow down
> Border'd with palm, and many a winding vale
> And meadow, set with slender galingale;
> A land where all things always seems the same."

With him we hear,

> "The swell of music on the wind that up the valley comes,
> And, later, it is not the distant stars that shine, but
> . . . . the Pleiads rising through the mellow shade,
> Glittering like a swarm of fire-flies, tangled in a silver braid."

The happiness of the frame of mind in which things are thus seen is as short-lived as it is keen. Probably the short life is an element in the strength of the pleasure. Vagueness is certainly another important one. We wish the pleasures were longer-lived and more substantial. Their peculiar elements, too, go against the solidity necessary for translation into a picture that might serve to recall in some measure the original agreeable emotions. A Tennyson or a Ruskin will now and again accomplish it with the pen—a Claude with the brush. At first sight the photographer seems to be hopelessly out of the running. It is surely no matter of focal length with a decimal in it, a developing solution based on a rigid chemical equation, or a result measured in inches of length and breadth upon a coated plate. The materialisation is too harsh to be practicable. But let us take a wider view. However essential these very matter-of-fact agents may be in accomplishing results, there is no more reason why they should necessarily give so severe and square a character to the results as to be palpably damnable than that the pen and ink should do the same with pictures of the word-painter, brush and paints with those of the artist. It depends less upon the instrument than the hand holding it, and, in further turn, less upon the deft hand than the directing brain. The more expert hand is not necessarily guided by the more talented brain. An untrained genius can do, and in practice repeatedly has done, more with the charred end of a skewer of wood than a highly-trained hand has with the finest of brushes and paint. The essential is the poetic, artistic, imaginative faculty. Now, if the painter and poet are born and not made, and the law of averages holds in this direction as in all others, there must be a proportionate amount of artistic and poetic feeling and sympathy amongst photographers. Probably the very fact of their having taken up photography goes to prove that there is more. Still, many a good man with a strong flame of this Promethean fire burning in his soul must often have keenly regretted the crudeness and unsuitability of his means to express his thoughts, or those of a master-mind when his own come into sympathetic contact with them. How many workers there are, for instance, who have longed for the power and means of expressing in a picture:—

> "Long lines of cliff that breaking have left a chasm;
> And in the chasm foam and yellow sands;
> Beyond, red roofs above a narrow wharf
> In cluster: then a moulder'd church; and higher
> A long street climbing to one tall tower'd mill;
> And high in heaven, behind it a gray down
> With Danish barrows; and a hazel wood
> By autumn nutters haunted, flourishing
> Green in a cup-like hollow of the down."

The illustration will serve at the same time to justify the title of the article. These idyllic thoughts and feelings are more likely to steal over, and take possession of, us in autumn than at any other season in the year. And in particular in the full glory of autumn in October. Few leaves have yet fallen, and the end and aim of the past year's work promises full payment in the yellowing gold of harvest. The warm air and earth, and the harvest moon, allow of the maximum living in the open that leads most readily to the suitable frame of mind. Most deeply does the appreciative mind desire to treasure its pleasurable emotions in some degree in a record. It is a desire as a rule in the abstract. There is no attempt at doing anything. It seems to be accepted that the matter is outside the range of the practical. Genius, it is admitted, might do it, but an attempt by anything outside of genius would but end in failure. Therefore, why try? The despondency is in some measure due to a mistaken conception as to what genius can do, and how it does it. We will not go so far as to say that genius is nothing more than "the capacity for taking infinite pains." It is probably a good deal more. But the genius that does take pains turns out much higher and more lasting work than that which does not. Further, it can be safely stated, that strong capacity, short of genius, taking pains, will nine times out of ten show a better result than genius without it. In this case, one leading direction in which taking pains applies, is persistent attention and observation. The three great artists already mentioned were particularly keen and loving observers of nature. Observation, however keen, will not turn out a Tennyson, a Ruskin, or a Claude Lorraine. Still, it is an open question as to how much of the charm of their work is due to the result of faithful observation, and how much to the faculty of aptly expressing the result. In any case it is reasonably clear that close and loving gazing at the face of Nature immensely increased power and breadth. Taking the case of Claude as the nearest in kind to photography, he frequently spent whole days in looking at the earth and sky. The result is, that he easily heads all, in the expression of distance, and in aerial perspective. Indeed, it is inconceivable that he could have gained his special power in any other way. He was a modest man, and, as a matter of fact, held that his success was in great measure due to his habit of observation, and the unconscious storing away of results, to be called upon at need. Earth, and sea, and sky, are the same to-day, in the twentieth century, as they were in the seventeenth. The human mind is much the same, for we refer, with the highest admiration, to the seventeenth-century painter, and confess that we

cannot equal his results. The appreciative photographer should be open in the same way to receive the same impressions. They would have the same elevating and refining effect upon his work. As it is, the tail wags the dog. A special sized plate, of a certain best kind for subsequent technical working is used, and the picture taken upon it subject to presumed inviolable rules of composition. The result is exactly what could be figured out beforehand, a first-rate mechanical reproduction of what was aimed for. A "perfect negative," if you will. What becomes of "perfect negatives?" Where are the prints taken from them? Why should not they be found upon honoured spaces on our walls? Simply because they utterly fail, as "perfect pictures," to stir up by any suggestion the emotions which are stored up in the soul, which is itself in touch, by personal observation, with nature, and the fine-grained idealism it can generate.

The truer method of working is to leave the camera out of consideration altogether until it has been determined what is to be expressed. The painter does not think of his paints and brushes when working out his idea. So it should be with the photographer. In the first place he must know what he wants. This depends wholly upon his own individuality and liking. Afterwards, success will be in direct ratio to the amount of interested observation he can give to the material of his desired picture, and the closeness with which he can fit technical execution to the purpose of expression Knowing what he wants, and where to get it at its best, fitting the technical portion in is a far pleasanter and more logical process than the reverse method. The dog now wags the tail. He will never get all he wants by a good deal. It is impossible to fully express an ordinary personal idea in a photograph, how much more out of the question a fine Tennysonian or Ruskinian one. But if the feel of it, as it were, can be expressed in small measure, and in a scrap, it will be a great gain, and the scrap will be treasured and often looked at. Say, for instance, a suggestion of the distance of the sea, the airiness of the moor, or the delicacy of cloud, things that we have often looked long at, and felt the vague attraction of, lying on the sand or the heather, in the glorious warm life of October. Even Hyde Park, looking towards the west shortly after the sun has gone below the horizon on a fine October evening is very beautiful. Out of the thousands of capable photographers in London, is there not one who can suggest it as a city park, and still show distance, wealth of tree without excess of detail, and approaching twilight softening out Kensington spires? Hung on the wall of the closed-in drawing-room, or office, any of these will have a marvellously soothing effect when soothing effect is most needed, after the summer has passed away. There may not be any acknowledged "lines" in the composition. But the lines of composition need not run in the same directions as the lines of feeling, and there is surely no question as to which should take the premier place. Let each man play confidently off his own bat to suit his own tastes. He can be very certain that if an acknowledged authority ignored all laws of composition, and turned out a pleasing result, it would be accepted as readily as the "Blue Boy." The idea need not apply solely to landscape. It will do so in every other direction. Even in so apparently inherently unpromising a direction as portraiture, where exact likeness is inferentially a *sine qua non*, some studies of heads and faces expressing broadly, softly, and suggestively, some of the deeper and kindlier emotions are very attractive. It is also pleasing proof that some good and thoughtful workers are engaged along the lines advocated in the foregoing.

THE BIOGEN: ADVERTISING BY MEANS OF PHOTOGRAPHY AT THE GLASGOW EXHIBITION.

WHAT must be deemed a new phase in advertising by means of photography is being shown at several points throughout the Exhibition. This clever application of the principle of persistence of vision consists of a machine which contains a large number of photographs (probably as many as fifteen hundred on each reel), and, although in some respects resembles the mutoscope, differs entirely from that instrument by reason of the fact that it is not a "penny-in-the-slot" machine, the Biogen being constructed so as to permit of groups of spectators viewing the photographs in animated form by means of several lenses of the graphoscope description which are placed in front of the machine. The Biogen is the latest novelty brought out by the Biograph and Mutoscope Company, Ltd., and has been placed before the public in a most perfect form, every machine working with a regularity which is most astonishing. The reel containing the photographs (which are taken instantaneously in the same manner as the continuous rolls of film by the company's well-known method for producing views for projection by means of the biograph) is driven by a very small electric motor contained in a corner of the chamber, and the mere touching of a button not only gives the necessary motion to the reel so as to bring each photograph for the briefest possible period of time before the spectators, but likewise throws into gear the means of illuminating each picture as it comes into view. This takes the form of an exceedingly neat incandescent lamp placed immediately over the photographs, causing them to be brilliantly lighted, and enabling them to be seen with great brilliancy in a magnified form by the spectators standing several feet away in broad daylight. As many as twenty or thirty spectators can conveniently view the photographs at one time; in fact it resolves itself into a mere matter of arranging the group of spectators in convenient positions around the machine.

We recently had the pleasure of witnessing the working of one of these machines, when Mr. Cable, the courteous representative of the Biograph Company, explained the various movements employed to rotate the photographs, and were struck with the great simplicity of all the movements employed, which, in point of fact, are within the power of any one to control or set in motion, being as easy to govern as an ordinary musical box. We understand it is not the intention of the company to utilise these machines after the manner of their mutoscopes, but to arrange for their employment by large and popular firms as advertising media. For this they appear to be particularly well adapted, being capable of application to any trade or industry, It struck us when viewing the working of the Biogen that, in addition to the purposes which the Biograph Company have designed for it, the machine might prove of great value from an educational point of view, for continuous pictures could be shown before an entire class at one time. It certainly opens up a wide field for photography in its adaptability to many useful purposes. The photographs are all printed on bromide, but the company provide coloured views when desired.

HINTS TO BEGINNERS IN LANTERN PROJECTION.*

II.

IN a previous article reference was made to the importance of a beginner giving personal attention to every detail connected with his arrangements and the apparatus it is intended to employ. Nothing should be taken for granted, or left for other people to provide or look after. By invariably attending to this suggestion breakdowns will be avoided that otherwise are certain to occur. A beginner might imagine that a good form of blow-through, or, as it is otherwise termed, safety jet, would be the most suitable to employ when commencing limelight work. Doubtless the term "safety" is very euphoneous and attractive, but has done more than anything else to popularise this form of burner, but a blow-through jet is inferior in every respect to a good "mixer," and it is advisable that a beginner at the very outset should divest himself of all thoughts of danger when approaching this work, feeling confident that when cylinders are employed a mixing jet is absolutely safe, and that were he to try his level best he would not succeed in negotiating an explosion of any moment when using a mixing jet. True, a few pops or snap-outs may fall to be recorded, but these are the result of faulty manipulation, and are in no way dangerous. The advantage of a mixed jet over a blow-through form lies in the fact that, with the same consumption of gas, a very great increase of light is obtained, with far less heating of the lamp, and the light is much easier obtained and kept steady when adjusted. One of the first troubles a beginner will have to face, if he elects to use a blow-through form of jet, is the over-heating of his lamp. The larger tongue of flame from the hydrogen tube generates a great amount of heat, and in the hands of novices, such has often been known to scorch, and even set fire, to the woodwork of the shell, and when this occurs "funk" is not very far off. It is claimed as an advantage for the blow-through form of jet that such can be used by drawing the supply of hydrogen gas

* Continued from page 68, Lantern Supplement

from the ordinary pipes of a dwelling-house. This is perfectly true, but a beginner will not be long in finding out that for one display in a private house he will be called upon to give twenty in some public building, such as large halls, churches, Sunday schools, etc., and when he has to face what may be termed medium to long-distance projection, he will want all the light he can command, and soon find out that for really serious business the mixing jet is the only practical form of jet to employ. This means working off compressed hydrogen in cylinders, as well as oxygen, and, although it may be slightly less economical than would be the case in drawing the hydrogen from the ordinary gas supply, on the other hand, there is the drawback of frequently having to employ long lengths of tubing to conduct the gas to the lamp, which at times gives no little trouble to accomplish, as well as offering temptations to youngsters to so tamper with the tubing as to extinguish the light in the lamp. The slight extra cost of something like half a crown for each display when using double cylinders is never grudged by those who from experience know the comfort and advantage of working off cylinders.

At the outset, therefore, a beginner would do well to form a fixed determination to use in all circumstances a good form of mixing jet, or such a one as is capable of being worked at high pressure from cylinders. The writer in all his experience, extending now over very many years, has never known a case in which any one ever discarded the use of a mixing jet for that of a blow-through form; but, on the contrary, could point to innumerable instances where the latter has been discarded for the former, with the remark, "What a fool I was ever to have used a blow-through." Considerable improvements have during years been effected in the construction of mixing jets, and they are now procurable in various forms, slightly different from what they were some years ago. The principle of construction, however, is the same, and many of the modern form of jets are very carefully packed, so as to ensure a thorough mixing of the gases and a silent light when good pressure is employed. This has entailed, in almost all cases, the adoption of larger mixing chambers than were previously deemed necessary, and in some cases a fresh departure in the form of packing, so as to provide a steady silent light with varying apertures in the nipples. The packing now provided in modern jets necessitates the employment of higher pressure than was formerly the case, and this has been fully recognised by those who supply the newer forms of regulators specially designed to meet such requirements. As a rule, it may be taken that these regulators are loaded to a pressure of two-and-a-half pounds, this pressure being nearly four times greater than was found necessary with the earliest patterns of mixing jets, which in some instances contained nothing at all in the shape of packing, or, if so, merely a few discs of metallic gauze, which, although helping to mix the two gases, were insufficient to provide for a really powerful light without hissing.

In addition to this provision for ensuring a silent system of working, all high-class modern jets are fitted with what is termed a cut-off movement, and this is really a most valuable addition to a jet. To Mr. Andrew Pringle is due the credit of having, a good many years ago, conceived the idea of having additional taps applied to a mixing jet, by which means the light at the nipple could be lowered and raised without in any way altering the adjustment of the gases, as provided for by the ordinary taps. This cut-off movement has proved of immense utility in numerous instances where what may be termed high-class projection has to be conducted, and, although in some instances makers of our more modern forms of jets have improved on the original form as devised by Mr. Pringle, the principle is exactly the same as was first introduced by him. To take full advantage of this valuable addition to a jet, it is, of course, necessary that a beginner should understand it is imperative to use regulators on his cylinders. If this precaution be not observed the back pressure will accumulate in the tubes, and in a very brief space of time either rupture the tubes or blow them off altogether. When, however, regulators are used such jets permit of a wide range of liberty being taken in the form of lecturing, and this is especially the case since the almost universal introduction of the electric light into buildings of any importance. A striking example of their utility came recently under the writer's notice when a distinguished medical gentleman was reading a paper before the Faculty of Physicians and Surgeons, where, of course, every modern convenience in the form of electric lighting was at command. In this case the entire system of electric lighting in the hall was capable of being controlled by the lecturer merely pressing a button, by means of which the light was instantly raised or cut off at will. After describing various slides which were projected from the lantern at the extreme end of the hall the lecturer frequently found it necessary to refer to models displayed on a table at hand on the platform. This meant suddenly raising the lights in the hall and cutting off the limelight in the lantern during the time the lecturer was drawing the audience's attention to the fixed models on the platform, after which the lights were as suddenly altered to show the previous slide upon the screen. It was only by means of one of the most modern forms of mixing jets, in which both gases were cut off by merely raising or lowering a small lever, that this finished and extremely beautiful method of limelight projection was effected, and the lecturer himself, who had never seen the attachment previously utilised, was so enamoured with the movement that he declared he would never again lecture without employing such a jet, and, if possible, a similar means of instantaneously raising and lowering the lights in the lecture hall.

Old-fashioned workers might imagine that the same results could have been achieved by merely capping and uncapping the lens. Yes, and what about the liability of injury to a valuable slide being subjected for a length of time to the heat from a very powerful jet? Also the waste of gas, not to speak of the comfort of being able to cool down the lamp for the minutes the cut-off movement was in operation. The fact is, these cut-off attachments are of immense utility, and a beginner would do well at the outset to realise this, and arrange the rest of his apparatus so that he can take the full advantage of this form of jet when occasion requires. It is well known that whenever a very intense light is desired more gas must be burned to yield the same. This means the employment of large apertures in the nipples of the jet. Beginners, however, should never attempt to use large bores when commencing this work, but rather confine themselves to what may be termed medium to small apertures, such as the one-twentieth to one-twenty-fifth of an inch, by means of which a good steady seven hundred and fifty to a thousand candle-power light can easily be obtained with good pressure without any noise, and a light of this capacity is all that is required for plain slide projection. It is really only in such work as cinematographic projection that larger bores are required, and then a very great amount of heat is generated, far too much for slide projection, where at times they would be subjected to such heat for several minutes' duration.

It will not be long before a beginner will realise the importance attaching to the limes he uses. In single lantern projection, where it is undesirable to have any interruption to the light during an entire evening, large hard limes of the very best quality ought to be selected. A really good sample of lime is a great desideratum, and it is false economy to grudge a slight extra cost when purchasing it. Among lantern operators there is some difference of opinion regarding the most suitable size of limes to employ. Where rapid dissolving has to be conducted by means of mechanical dissolvers, the chief thing is to arrange for the full intensity of light being secured as rapidly as possible, and this is probably acquired by a smaller cylinder of lime with considerably more efficiency than in the case where a constant light has to be manipulated for a considerable length of time. In the latter case, large cylinders are undoubtedly to be preferred, and if they are of the very best quality, say, of 1¼ in. in diameter, one such lime will run through an entire evening without giving any trouble or anxiety. Of course, this means the taking of the utmost precaution to ensure the limes being kept in good condition. Several methods have from time to time been advocated for the preservation of limes. The plan the writer has always adopted consists of enclosing each lime in a wrapper of paper made proof against damp by immersion in melted paraffin wax. When two folds or wrappers of the paper are placed around each lime, and they are replaced in their practically air-tight tin, limes will keep for any length of time if stowed in a dry corner of the kitchen or other room free from damp. Too much care cannot be bestowed on limes. If they happen to contract damp and become slaked, good-bye to any comfort when using them. They are practically useless.

Reference has been made to the apertures most suitable for a beginner to use. When, however, a new jet has been acquired it is well to get the maker to supply a few spare nipples of various apertures from one-thirtieth to one-twentieth of an inch, and these should be provided so as to screw on and off easily without permitting an escape of gas when merely screwed on without red or white lead.

A. T. Newton.

The annual report of the Imperial German Patent Office gives some interesting statistics as to the progress of the inventive energy of the country in the various technical branches. Only a few examples can be given from the mass of material. The number of applications for patents was 21,925, 4000 more than in the previous year. Of these 8784 patents were ultimately granted, 3244 of this number being granted to foreigners. Since the enactment of the Patent Law, 1877, 285,372 applications have been made and 117,974 patents have been granted.

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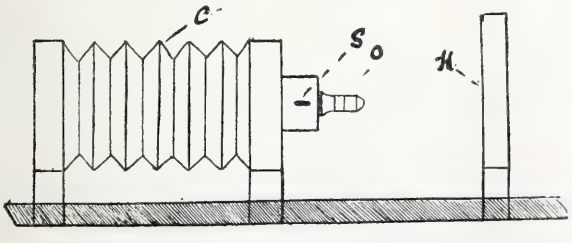
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STEREO-PHOTO-MICROGRAPHY.

A branch of photo-micrography which is capable of yielding most beautiful and interesting results, but which has up to the present attracted little or no attention, is stereo-photo-micrography. Its neglect is, no doubt, largely due to the fact that very few up-to-date microscopists use, or possess, a binocular microscope, and therefore have not had an opportunity of fully realising the beauties and advantages of the stereoscopic image; otherwise they must surely sooner or later have desired to produce similar effects photographically.

The wide and rapid spread of high-power microscopical research is, no doubt, chiefly the cause of the binocular microscope having fallen into disuse and disrepute, the instrument being quite unsuitable for any work requiring a higher magnification than one hundred to one hundred and fifty diameters. Yet what a field of interesting and beautiful work that medium magnification covers! A world almost unknown to many amateur microscopists of to-day.



Camera, etc., in position for taking a Stereo-photo-micrograph.—C, Camera; S, Adjusting screw of prism; O, Micro-objective; H, Stage to carry specimen.

Any one possessed of a half-plate camera with a good length of bellows, and two or three micro-objectives of moderate magnification, such as a two-inch, one-inch, and half-inch, may practise the art of stereo-photo-micrography, the only additional apparatus required being a pair of Stephenson's binocular prisms. As stereo-photo-micrography comes under the head of low-power work, the microscope itself is not required, the prisms and objective being attached directly on to the front of the camera. Stephenson's prisms are frequently fitted to the compound microscope, when they are used as reversing prisms to facilitate dissecting operations and the arranging of small objects such as sponge-spicules, foraminifera, diatoms, &c., into groups or patterns. They are doubly useful to the photo-micrographer, as, by employing them, there is no necessity to cut and transpose the photographs, as is the case with ordinary stereoscopic work.

The Stephenson prisms can be obtained from any of the recognised makers of microscopes and microscopical accessories, such as Messrs. R. & J. Beck, of Cornhill, and Messrs. Baker, of High Holborn.

The camera should be mounted on a travelling stage of sufficient length and breadth to afford a firm support to the camera when its bellows are racked out to their fullest extension. To the base of this camera-stage, two grooved blocks of wood should be firmly attached, the grooves corresponding in angle to the two V-shaped rails which run the whole length of the baseboard.

The baseboard to carry the camera, object-holder, &c., should be made of well-seasoned pine, ten inches wide, five feet long, and one inch in thickness. Fastened to the edge, and running the entire length of the baseboard, there should be two V-shaped rails, on which the camera, object-holder, &c., can be moved into the required position.

The object-holder must be so constructed as to bring the specimen exactly in front of the lens, and in a central position. The detailed description of how to build a very useful form of object-carrier for low-power work will be found in the Monthly Supplement to The British Journal of Photography for April 5, 1901.

A small well-made box must be carefully constructed to carry the prisms and objective; or better still if obtainable a short wooden cylinder. In either case, the interior must be perfectly smooth and

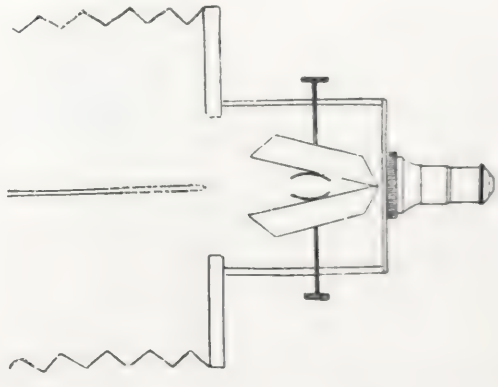


Diagram to show how the micro-objective and Stephenson prisms are mounted and attached to the camera.

painted a dead black; and at one end must be fastened a lens flange for attaching the box or cylinder to the camera, and at the other end a "universal" screw to receive the micro-objective.

The prisms must be mounted within the box or cylinder in such a manner as to be immediately behind the objective, and as near to its back lens as is possible. The prisms should be fitted with two adjusting screws capable of being manipulated from the sides of the box or cylinder, so that the angle at which the prisms are inclined to one another may be altered if necessary.

A telescopic partition must be constructed to run through the length of the camera in an exactly central position.

The exposure required for a good stereo-photo-micrographic negative will be found to slightly exceed that allowed for ordinary low-power work, as the light has to pass through the Stephenson prisms ere impinging on the sensitive surface of the plate. To obtain the best results, a full exposure should be given, so as to obtain vigorous negatives, full of detail and with good contrasts.

Prints from the resulting negatives should be made on albumenised paper, or Eastman's "Solio" P.O.P., if the former is not obtainable; while for those who can only work during the winter evenings, or wish to be independent of sunlight, the "Nikko" bromide paper made by the same firm, developed with amidol, and pressed into contact with a ferrotype plate to dry, will be found to yield most beautiful results.

But by far the most striking affects will be obtained by making transparencies from the stereo negatives, as by employing different developers, varying the length of exposure, and after-toning, a wide range of colour effects, from cold black to bluish black, through various tones of brown to red, can be produced.

The prints and transparencies can, when finished and mounted, be viewed with the aid of an ordinary stereoscope, of which several cheap and handy forms are now to be obtained at a very moderate price.

F. Martin Duncan.

CONTRIBUTIONS TO OUR KNOWLEDGE OF COLOUR IN PHOTO-MICROGRAPHY.[1]

One of the most perplexing and as yet unsolved problems of photo-micrography is that of colour values, i.e., how to reproduce natural colours by means of the sensitive plate. Of the plates now in use, the orthochromatic approaches most nearly the ideal colour plate; yet this is not perfectly satisfactory, as it does not give sufficient contrast.

The investigations which form the basis of this article were undertaken to determine the relative merit of various photographic plates. The apparatus, as illustrated in fig. 1, consists of a direct vision

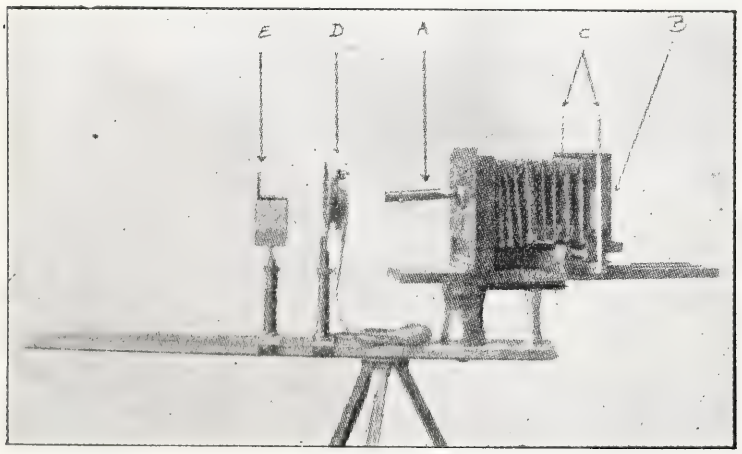


Fig. 1.

Apparatus for making spectrographs.—A, Spectroscope. B, Back of camera, carrying screen and plateholder. C, Supports upon which the back (B) may be moved. D, Shutter. E, Colour screen in colour screen holder.

spectroscope so mounted in the front board of an ordinary camera (with lenses removed) that the spectrum, when projected on the plate, will come in the centre horizontally and at the top of the plate. The back of the camera is constructed in such manner as to allow of its being moved in the vertical plane, thus making it possible for one to make four exposures on the same plate, and by so doing to make an accurate comparison between them.

The plates examined may be grouped according to their degree of perfection as follows:

[1] F. L. Richardson. Journal of the Boston Society of Medical Sciences, 5: 460-464.

Group I.—Characterised by a very high degree of sensitiveness a little above line D, falling off abruptly on either end, and only slightly sensitive to the greens and blues.

Group II.—Characterised by two distinct maxima—one a little above the D line, and the other in the blue-green. Between these two maxima the sensitiveness falls very considerably.

Group III.—Characterised by having its maximum sensitiveness in the blue (as with ordinary plates), with lesser bands of sensitiveness extending below the D line.

Group IV.—Characterised by bands of sensitiveness extending below line D, with greatest intensity in the yellow-green, and falling off at the violet end before H_2.

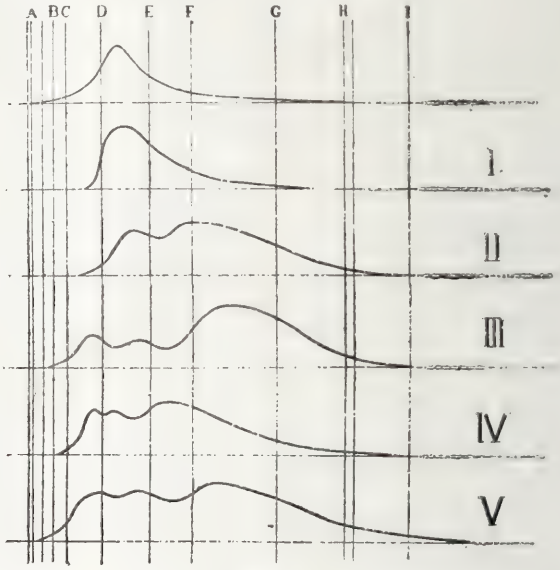


Fig. 2.

Explanation to Figure.—The upper curve shows the visual intensity of the spectrum (from Fraunhofer). Curves I.-V. represent the photographic intensity of the spectrum taken on plates from group of corresponding number. Group I.—Cramer isochromatic (slow). Group II.—Standard orthochromatic (slow); Forbes orthochromatic (slow); Carbutt orthochromatic (slow); Otto Perutz. Group III.—Lovell colour-differentiating; American spectrum plate. Group IV.—Cadett & Neall spectrum plate (slow). Group V.—International "Erethro."

Group V.—This group most nearly approaches perfection. It is characterised by a sensitive band well below line D, and somewhat below the red end of Groups III. and IV. This plates gives an almost uniform degree of sensitiveness with a maximum intensity in the green.

If sensitiveness to the spectrum were the only feature to be considered in the selection of a plate for photo-micrographic work, a plate from Group. V. would be chosen, but the general working of the plate as well as the keeping qualities are factors that must be considered. For practical work and keeping qualities the author found the Cadett & Neall Special Slow Spectrum Plate of Group IV most satisfactory, and used it in the preparation of the spectrographs illustrated in fig. 3.

The perfect photo-micrographic plate would give equal photographic intensity to all the colours of the visual spectrum, but since this degree of excellence has not been attained, the value of a given plate may be enhanced by the use of colour screens, or ray filters, which serve to increase or decrease the photographic intensity of a colour. The following are the laws upon which the use of colour screens is based:—

First. To increase the photographic intensity of a colour, a screen of complementary colour should be used.

Second. To decrease the photographic intensity of a colour, a screen of the same colour should be used.

These laws hold good for all branches of photography, whether by transmitted or reflected light, and are not dependent upon the position of the screen, i.e., whether the screen is placed between the source of illumination and the object, between the object and the objective lens, or between the lens and the plate.

In determining the photographic complement of a colour it is mor

accurate to make photographic analyses of stains and colour screens than to make simple visual analyses.

The same plate and source of light must be used as in taking the photo-micrograph, because, as shown above, plates of different makes may differ greatly in their degree of sensitiveness to different parts of the spectrum, and it is a well-recognised fact that different illuminating agents give different spectra. The object for which one

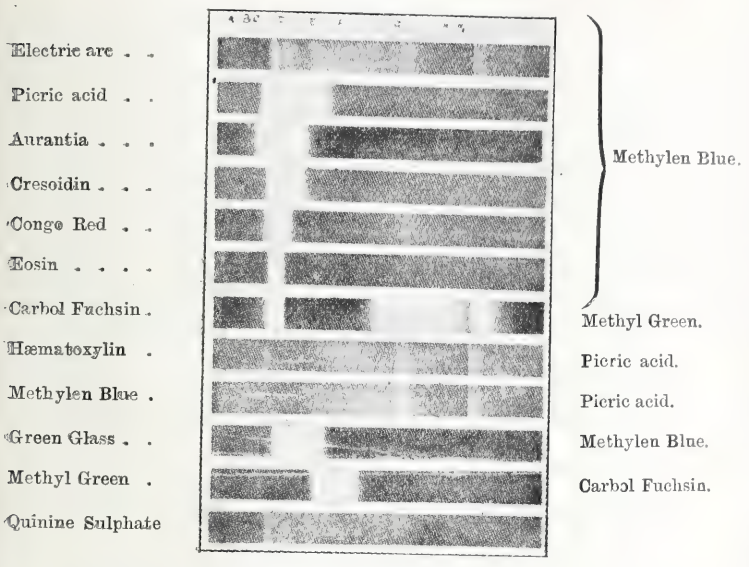


FIG. 3.

Explanation to Plate.—This plate is a reproduction of spectrographic analyses of some of the common stains. The red end of the spectrum is on the left. The principal Fraunhofer's lines are marked. The name of the stain is on the left, while on the right is the name of the proper screen to use to increase the photographic intensity. To decrease the contrast use a screen of the same colour as the stain.

should strive in the analyses of stains and colour screens is to imitate as exactly as possible the conditions that will exist in the process of photo-micrography. The spectrographs illustrated in fig. 3 were made with colour screens in preference to cells of fluid, as the screens are much more convenient than cells, and are quite as satisfactory. The colour screens are made by soaking a cleared lantern-slide in a solution of the desired stain until the gelatine is saturated, then rinsing and removing the surface liquid with a cotton pad. The screen is then dried and covered with a cover-glass as in mounting a lantern-slide. The depth of colour in these screens is dependent upon the degree of concentration of the staining solution rather than upon the length of time the plate is soaked. C. W. J.

A CINEMATOGRAPHIC INCIDENT.

GOOD showmen are, like poets, "born, not made," and this aphorism applies quite as well to the exhibition of animated photographs, as it does to such giants as Barnum or Kiralfy. It is certain that no one but a born genius would have hit upon the method of stimulating public interest in his show which we are now about to detail. The story is in all its essential features literally true, but for obvious reasons locality and names are suppressed.

The entertainment took place in a large northern city, and was an intensely patriotic one. The pictures, which were all taken, or supposed to be taken, "at the front," were so numerous that they followed on one another's heels with scarcely a second's pause, and a blatant brass band had far more work to do than had the gentleman in an expansive white shirt-front, whose duty it was to get in a word or two edgeways, occasionally, by way of explanation. The show was thoroughly good, but after the first week or two the attendance began to flag, and something had to be done to give the thing a fillip.

"I have it!" suddenly said the proprietor, one morning, to his factotum. "Bill, can you beg, borrow, or steal, a khaki uniform?"

Bill, being a man of somewhat slow apprehension, found it necessary to scratch his head, to tickle up his brains before he replied

"Well," said he, "I have a cousin what's just returned from the war, and——"

"All right," said the boss, "get his uniform, return here by one o'clock, and I'll tell you what I want you to do."

Bill returned at the appointed hour, dressed in the khaki which had figured upon many a stricken field, and was closeted for a long time with his master. If any one had cared to play the part of eavesdropper outside the door, he might have heard a kind of informal rehearsal going on, interrupted with such interjections as, 'That won't do, you juggins! Speak up louder—louder still, you cussed idiot!" and so forth. What this rehearsal foreshadowed is best shown by what occurred some hours later when the animated picture entertainment was in full swing.

The particular picture upon the screen represented the boulder-strewn veldt of South Africa. A dispatch-bearer is seen in the distance, threading his way through the rocks, closely pressed by half a dozen Boers; he turns and kills three of his enemies, but the rest bear down upon him, and they all roll over and over on the ground.

At this picture there was a commotion among the audience. A man, evidently a soldier, for he was dressed in khaki, was seen struggling in his seat, but held back by companions. "Let me get at them—let me get at them!" he cried again and again. The band stopped playing, the lights were turned up, and the lecturer stepped forward and spoke kindly to the man in khaki. "My good man," said he, "you must not get so excited; those were not Boers, but only pictures of Boers." The man in khaki looked round vacantly for a moment, put his hand to his head, and exclaimed, "Good heavens, I thought it was all real!" and sank into his seat. Cheer upon cheer rose from that audience. This one touch of nature had made them kin. And the next morning the local papers described the incident in glowing terms, one of them in its admiration even going to the length of a leaderette.

From that evening the show was patronised so well that not a vacant seat was to be seen. And Bill was richer, that same week, by a five-pound note.

DETECTION OF NEW NEBULÆ BY PHOTOGRAPHY.

THE advantages of a photographic doublet over the ordinary photographic objective for astronomical work have already been pointed out by the writer elsewhere. Not only may a far larger field be covered by each photograph, but a much larger angular aperture may be employed. The greatest advantage is attained in photographing a faintly illuminated surface. If the angular aperture be defined as the linear aperture divided by the focal distance, the amount of energy received on any portion of a sensitive plate exposed to the image of a given surface will be nearly proportional to the square of this quantity. The angular aperture of an ordinary objective seldom exceeds one-twelfth, that of a photographic doublet is often greater than one-sixth. The latter will therefore accumulate more than four times as much energy as the former. If the time required to produce an image were that required to receive a certain amount of energy, the doublet would photograph a faint object in one-fourth part of the time required, under the circumstances above supposed, by an ordinary lens. In reality the difference is greater, since with a given lens the requisite time of exposure is more than doubled when the brightness of the object photographed is reduced by one-half. A limit is reached with the most sensitive plates that have been made when applied to astronomy, owing to the light of the background or sky. Long exposures cannot be made in moonlight, or indeed on any night in the vicinity of a large city where electric lights are used. Evidently one of the most important applications of the principles described above is to photographing nebulæ. An attempt has therefore been made to enumerate all the nebulæ photographed in a given portion of the sky, and compare the result with that of existing catalogues. From this we may infer whether it is probable that the number of known nebulæ may be

greatly increased by this method. The region selected extended from 5h. 10m. to 5h. 50m. in right ascension, and from −10° to +5° in declination. The Nebula of Orion is near the centre of this region, and several photographs had already been taken of it at the Harvard College Observatory. The instrument employed was the Bache telescope, which has a photographic doublet with an aperture of eight inches and a focal distance of forty-four inches. Each plate covers a region ten degrees square, the definition being good in a central circular area about seven degrees in diameter.

The examination of the plates was made by Mrs. M. Fleming, according to the following method. Each plate was laid on a frame inclined at an angle of 45°, and the light of the sky reflected through it by means of a horizontal mirror. Each portion of the plate was then studied with a magnifying glass, and the co-ordinates of every object resembling a nebula were measured. The approximate right ascensions and declinations of these objects were next determined from the configuration of the adjacent stars on the charts of the Durchmusterung, which are upon the same scale of two centimetres to a degree. A comparison was next made of all the objects detected upon any of the plates. The results of these two examinations are indicated by the following letters: A denotes that the object was found in the original examination of the plate; B, that, although overlooked at first, it was detected when looked for; C, that on the second examination its confirmation was doubtful; D, that it was not confirmed; and E, that the region was not contained upon the plate. A repetition of the letter A indicates that the object was found independently on different plates; of B, that it was confirmed when its position was known, although in general too faint to be detected independently; C does not confirm, and D indicates that the object may be a defect in the plate; E gives no evidence one way or the other. Four plates were examined in this way. A fifth plate, 2414, was used to check the results of the others. In the following description the first number refers to the series of plates taken with the Bache telescope.

2312. February 6, 1888. Exposure 90m. Declination −10° to 0°.

2325. February 7, 1888. Exposure 187m. Declination −10° to 0°. Images elongated owing to the length of the exposure, and bent up at the ends owing to the differential refraction. The back of the plate was covered with shellac and lampblack, to absorb the light reflected from the rear surface of the plate.

2335. February 13, 1888. Exposure 77m. Back of plate varnished like 2325. Declination −7° to +3°.

2414. March 4, 1888. Exposure 78m. Declination −5° to +5°. The clock ran badly during this exposure, so that each star formed two images connected by a trail.

2423. March 6, 1888. Exposure 69m. Declination −5° to +5°

TABLE I.—LIST OF NEBULÆ.

No.	R. A. 1855	Decl. 1855	Exam.	Res.	No.	R. A. 1855	Decl. 1855	Exam.	Res.
	h. m.	° ′				h. m.	° ′		
1	5 15.2	+3 24	EEAC	D	15	5 29.5	−6 45	AACE	N
2	19.0	−8 40	ADEE	D	16	29.6	−6 36	ABCE	N
3	24.3	−0 19	CACE	D	17	31.5	−7 10	ABEE	N
4	25.1	−4 36	ABCE	N	18	31.6	−6 40	CACE	D
5	25.3	−8 11	ABEE	N	19	32·9	−1 32	AACC	N
6	25.8	−0 22	CACD	D	20	33.6	−1 34	AAAC	N
7	26.0	−0 43	AAAA	N	21	33.8	−2 29	AAAB	N
8	26.0	−1 56	ADDD	D	22	34.3	−2 20	AAAA	K
9	26.3	−0 25	AAAA	N	23	34.5	−1 50	AAAA	K
10	28.0	−4 59	AAAA	K	24	35.7	−2 23	AABA	N
11	28.0	−6 9	CACE	K	25	39.3	+0 1	AAAA	K
12	28.2	−5 50	AAAE	K	26	39.6	+0 16	AAAA	K
13	28.5	−3 35	ADDD	D	27	41.3	+0 21	DDDA	D
14	29.4	−0 20	AAAA	N					

In the above table, a number for reference is followed by the approximate right ascension and declination for 1855, by the letters indicating the result of the examinations as described above, and by a final column giving the probable conclusion. The letter K denotes that the object is a known nebula, occurring in the recent catalogue of nebulæ prepared by Dr. J. L. E. Dreyer ("Memoirs of the Royal Astronomical Society," XLIX., Part I., page 1). N denotes that the object is a nebula, and, as it does not occur in the catalogue mentioned above, we may infer that it has not previously been detected. D denotes that the object is probably a defect in the plate. All doubtful objects were carefully examined a third time, and a direct comparison of the plates generally left little uncertainty. A further description of these objects will be found in the following

REMARKS.

1. In plate 2335, DM. +3.871°, Mag. 5.3, is situated a little outside the limits of the photograph. A band of nebulous light, however, extends about 10′ south of it. As this nebulosity is not confirmed by plates 2414 and 2423, it is probably due to a defect.

2. Dreyer 1927 has the position, R. A. 5h. 14.4m. Decl. −8° 30′, and is described as a diffused nebulosity. No such object is visible in the photographs in this position, but on plate 2312 a straight nebulous line extends from D M. −8.1119° in R. A. 5h. 19.0m. Decl. −8° 40′ to DM. −8.1132° in R. A. 5h. 21.6m., Decl. 8° 50′. It passes through about sixteen faint stars upon this line. Most of these stars are also visible on plate 2325, but the nebulosity is not perceptible there. Although perhaps a defect in plate 2312, the resemblance to the nebulous lines found by MM. Henry in the Pleiades is striking.

3. An irregular patch of nebulous light about 8′ in diameter, 6′ north of δ Orionis, and preceding that star 0.3m. Probably a defect, as it is not confirmed by plate 2312, 2335, or 2414.

4. Very faint nebulosity preceding and a little south of DM. −4.1162°. Not confirmed by plate 2414.

5. Faint nebulosity about 2′ in diameter.

6. Nebulous patch about 5′ in diameter.

7. Irregular oval ring having diameters 3′ by 5′. The position angle of the larger axis is about 165°.

8. Narrow line about 10′ long, doubtless a defect of plate 2312.

9. Nebula about 2′ in diameter, brightest on following side.

10. Nebulosity surrounding *c* Orionis. Dreyer 1973, 1975, and 1977 are portions of this nebulosity where the condensation of light is sufficient to be visible to the eye. The photograph gives it an extension of 2m. in right ascension and of 2.5′ in declination. As it is connected on the following side by nebulosity with the Great Nebula of Orion, true limits cannot be given in this direction. The photographs of this nebula are nearly equal to the best drawings yet made of the Great Nebula of Orion, both in extent and in the amount of detail shown.

11. A nebulous band extends south, preceding from DM. −6.1234° for about 6′. Plate 2325 shows that the whole of this region is included in No. 12. Dreyer 1980 is near, and perhaps refers to this object.

12. The Great Nebula in Orion, Dreyer 1976. With the sensitive plates and large aperture of the instrument here employed, the central portion of this nebula is burnt out with an exposure of an hour over a region of about −1m. in right ascension and 15′ in declination. The entire nebulosity extends continuously from about 5h. 26m. to 5h. 30m. in right ascension, from −4° 40′ to −6° 10′ in declination. It therefore includes Nos. 11 and 12. The bright nebulosity Dreyer 1982, north following the Great Nebula, is connected with it by a nebulosity which photographs so intensely that the details of its structure are not well shown with long exposure.

13. Defect in plate 2312.

14. Faint nebula about 5′ in diameter.

15. A large patch of faint nebulosity, probably connected with No. 12. Dreyer 1999 is near here, but the description given is unlike that of this object.

16. Perhaps this object should have been included with No. 15.

17. Nebulous band 3′ wide extending 10′ north preceding from DM. −7.1142. Probably connected with No. 12 through No. 15.

18. Nebulous band 3′ wide extending 5′ south preceding from DM. −6.1275°. Probably a defect in plate 2325.

19. Nebulosity surrounding DM. −1.1001°.

20. Well-marked nebulosity surrounding DM. −1.1005. Unlike most nebulous stars, the nebulosity does not fade away towards the edges. It looks rather like an irregular oval nebula on which a star was superposed.

21. A large nebulosity extending nearly south from ζ Orionis for about 60′. More intense and well marked on the following side, with a semi-circular indentation 5′ in diameter 30′ south of ζ. All good plates of this region show this object, and it has been used here as a test for some time. Attention was called to it in a letter of March 28, 1887, describing copies of some of these photographs sent to the Astrophotographic Congress of 1887. This object and No. 23

are probably the same as those referred to by Admiral Mouchez in the "Rapport Annuel sur l'Etat de l'Observatoire de Paris pour l'Année 1887."

22. Dreyer 2023. The nebulosity, which is mainly on the following side, takes the form of several spiral rays.

23. Dreyer 2024. An irregular nebulosity next following ζ Orionis, showing a very marked structure. A greater amount of detail is shown in this nebula than in any of the others of this list except Nos. 10 and 12.

24. Nebulosity surrounding DM. – 2.1350°.

25. Dreyer 2068, or Messier 78, is identical with this object. Dreyer 2064 preceding 0.4m. south 5′, and Dreyer 2067 preceding 0·2m. north 2′, are shown in plates 2312, 2325, 2335, and perhaps in 2423. They appear to be connected by a nebulous band passing on the preceding side of Dreyer 2068, which does not include it.

26. Dreyer 2071.

27. Defect in plate 2423.

The total number of clusters and nebulæ in this region which are contained in Dreyer's Catalogue is eighteen. Besides those mentioned above are the following:

1908. Very diffused nebula suspected by Herschel. Suspected in plates 2312 and 2325; not seen on the other plates.

1924. Not seen on any of the plates. Plate 2423 does not contain this region.

1980. Included in No. 12.

1981. Coarse cluster, well shown on all the plates.

1990. Including ε Orionis. Suspected on 2312, 2325, and 2335 not contained on 2423.

It therefore appears that fourteen of these objects are contained in Dreyer's Catalogue and the photographs. Four in the catalogue are not photographed. Twelve are detected by the photographs which are probably new. The region covered in about four one-thousandths of the entire sky, and the total number of objects in Dreyer's Catalogue is 7840. If the same proportion held, we might expect to discover four or five thousand such objects by photographing the entire sky. The vicinity of the Nebula of Orion has been so carefully studied by astronomers, that a still larger proportion of new objects might be found in other regions. Moreover, the southern sky has been comparatively neglected, and doubtless many faint nebulæ have escaped detection there. As the telescope employed covers so large a field in each photograph, it would not be a large piece of work to cover the entire sky. Only four hundred plates would be required, if there were no losses by overlapping or defective plates.

There is one consideration that may seriously modify this conclusion. The successive improvements in photography have continually increased the limits of the Nebula in Orion. These plates show that it not only includes the sword-handle, *c*, *ι*, and *θ*, but a long nebulosity extends south from ζ, others surround this star, while others both north and south indicate that perhaps the next increase in sensitiveness of our plates will join them all in a vast nebula many degrees in length. Another effect may be due to accident, but appears to be connected with the presence of the Great Nebula. While the region around it is crowded with minute stars, its immediate vicinity is much freer from them, and the same effect is noticeable on the preceding side of No. 21. A similar effect is shown around the large nebulæ enshrouding the Pleiades, which appear to be of the same character.

Annals of Harvard College Observatory.

PHOSPHORESCENT BACILLI.

A NUMBER of interesting experiments have recently been made by a Russian scientist, M. Tarchanoff, upon the phosphorescent bacilli of the Black Sea. He has made cultures of these minute organisms and finds that the luminous capacity lasts for from two or three weeks to as many months, according to atmospheric and other conditions. He finds that the emission of light is greatest in fresh cultures, when the bouillon is in movement and becomes mixed with oxygen, and that when the liquid is at rest, the upper layers only are light giving, which is accounted for by the proximity of these layers to the air. The influence of heat and cold is another important factor, the best temperature being from 7° to 8° C.; but the bacilli will retain their luminosity at as low a temperature as 4° C. Even when the bouillon begin to congeal, the bacilli give out their light, so that the curious condition is presented of "luminous ice." After a short time, however, the light dies out, but is restored once more when the bouillon is liquified. This ice has been photographed by its own light. With regard to the higher end of the thermometric scale, when the liquid is heated the light is weakened, and is extinguished at from 34° to 37° C., but comes back on cooling. At 50° C. the luminosity is destroyed once for all. Chloroform and ether quench the light; but such active poisons as strychnine and curare have no effect upon it, while potassic cyanide kills it outright. A curious experiment performed by M. Tarchanoff was to introduce into the dorsal lymphatic sac of a frog, a small quantity of the culture bouillon, so as to penetrate into the neighbouring lymphatic sacs and eventually into the blood. The result was that the entire frog became luminous. It is perhaps a matter for regret that the temperature of warm-blooded animals is too high for these luminous bacilli, for otherwise this frog experiment would open out a wide circle of possibilities. We can imagine that showmen, and possibly those who deal with so-called spiritualistic manifestions, would not be slow to make capital out of its adaptation to the human organism.

NOTES ON RADIOGRAPHY.

[Abstract of a lecture delivered at the Camera Club and reprinted from the "Club Journal."]

HAVING now explained to a great extent what has been done up to the present, I would like to say a few words upon what really is the subject of my paper to-night. Finding that in many cases I got very bad results in taking photographs upon paper, and conditions which gave fairly good results upon plates, I tried all manner of experiments, and one day I happened to disconnect the anticathode from all connection with the coil, and connect it to the disc at the other end of the tube. In this tube here you may wonder what this—aluminium disc at one side of the tube—is for; I hardly know myself. The makers are very fond of putting them in; but some light may be thrown upon it by this fact, that many tubes will flicker and behave in an extraordinary way, and if you only put your hand on the side of the tube, or even near it, you steady the whole thing. So probably the idea of steadiness from exterior objects has been the cause of inserting a piece of metal at the end in the tube. If they did that they connected it with the anti-cathode and put the two in contact together to the positive end of the coil, and the cathode at the other end in the usual way. One day in taking a photograph with paper I disconnected this and said to myself, I wonder if the current will pass if I go from end to end and leave the anti-cathode just somewhere half way.

To my intense surprise the current did pass, but it it not only passed—it passed twice as easily as before. Now insulated anti-cathodes are not new, though at the time I did not know it, but I don't think that the comparative effect in a tube with its electrodes under one condition as regards distance apart has ever been gone into or mentioned before. Now we come to a very interesting condition, if we find that the current, in having to pass along a greater space, does it more easily, and resistance is lessened. What is the cause? and next, what is the character of the X-rays which can freely bombard all its particles from the cathode end? What is the nature of them, compared with the bombardment, when the surface is electrically connected to the coil? That question is easily answered, and I will fix a tube to the coil, in order that you may see. The tube is of somewhat low vacuum. The terminals of the coil are now connected to the tube so as to leave the anticathode insulated, the spark gap is now tested, and you will note the distance. Now, if I connect the terminals of the coil with the cathode and anti-cathode, the spark gap is no longer sufficient. Though in the tube I have brought the cathode and the anode nearer, the spark gap is increased, and the tube is giving rays of higher penetration. If,

instead of insulating the anticathode, we simply vary the distance between the cathode and anticathode, as shown by Swinton, we get just the opposite result. It makes all the difference whether the anticathode has to play the part of anode as well, or a cathode and anode are used with an insulated cathode in between.

Two explanations may be attempted of this curious result. Either a counter-electromotive force is generated when the anticathode acts as anode, or that the mean free space of the gaseous molecules lies beyond the anticathode—that is, beyond the foccussing point of the cathode—and consequently the current passes more easily to the more distant anode, in a similar way to that which occurs in Hittorf's tube.

Very few tubes can be used for photography on paper for any length of time—they soon become too high—but by connecting up the tubes and taking off the connection between the anticathode and extra disc and putting the wires on the two most distant ends you can work the tube quite comfortably for a long time with paper. As paper may become very useful on account of its flexibility, the use of X-ray tubes in this way will no doubt prove very useful. You will remember what I said about rays in high vacua proceeding in straight lines, and also those in low vacua would turn the corner. By bending this tube at right angles we prevent the X-rays from travelling to the end of the tube bent at right angles, but if the tube is straight all the way the fluorescence would follow straight down. Interesting as showing that the rays seem to follow the laws of light in this respect, and will go in straight lines. It only remains for me now to show you one or two little effects of fluorescence. They are extremely beautiful. Of course, I have not the means of putting before you such a beautiful experiment as Sir William Crookes did when he illuminated a diamond of considerable value. Nevertheless, we have some rough rubies here which are pretty large, as well as other things, and you will see that they fluoresce very beautifully. I may mention that you can distinguish between fluorescence and phosphorescence. In phosphorescence, though the line is not very sharply defined between the two, we get an absorption of light or absorption of energy, whereas in fluorescence we are merely altering the length of the light wave from our original source. In most of the substances to be shown we get both fluorescence and phosphorescence.

Tungstate of calcium.
A shell.
Dolomite.
Silicate of zinc.
Rubies.
Marble.

All the colours of the marble can be obtained by fluorescence, There is no doubt that we have in the phenomena shown by high vacua matters of very great interest, and it will take a lot of work before we can say that we know very much about what is taking place; but the day may come when we, as Tesla hopes to do, may even light our homes with vacuum tubes of some description or other. At the present the thing remains, with the exception of the practical nature of X-rays, more in the sphere of interest than anything else, but it is to be hoped that in course of time, something of very great importance may spring up from it. As regards the practical value of X-rays, I don't think I need say much about that to you. They have proved themselves extremely useful indeed. From a medical point of view, I have had a good deal to do with X-rays. All the doctors within a ten-mile radius from my place at Ashtead are a perfect nuisance. Strange to say, the majority of cases are those of ladies. The number of ladies that fracture their wrists in riding bicycles is almost incredible. Nine in ten of all the cases I have to do with—and I think I had to do nearly about one hundred in the little village of Ashtead —have been those of ladies. Men don't sprain their wrists very easily; but, quite apart from finding fractures, we have hopes that X-rays will prove useful in other respects. We can already see dilatation of the heart or find tuberculosis of the lung; see aneurisms and see calculi. Surgeons are rather disgusted because their fractures show up rather badly. I have never yet seen a broken limb properly set. In the "Lancet," in an article by Mr. Lane, the great surgeon, he says that fractures are a disgrace to surgery. The X-rays have simply shown them up. As to the value of X-rays in fractures, I don't know that very much has been done, and it comes to this, that in future cases if they want to make a good job of a broken limb they will have to wire the bones together. You can fix the bones easily under a fluorescent screen, but the moment you let them go and attempt to put a splint on, they slip out of place. And so now many surgeons, when they see the bones in an arm or leg lying side by side, they say let them alone—it will come out all right in the end. Much will have to be done before we can say that a surgeon makes as good a job of a broken limb as a carpenter does of a broken chair. My thanks are due to Messrs. Cox and Cossor for so kindly lending me their apparatus.

JAMES CADETT.

SOME EXPERIMENTS RELATING TO HALATION.

IN view of the fact that a considerable amount of discussion has recently taken place on the subject of halation and the comparative merits of different backings, an account of a few experiments which I lately made in this direction may not be entirely without interest.

The following apparatus is employed: A sheet of cardboard, coated with a deep black, is fastened against a wall as shown at A in the

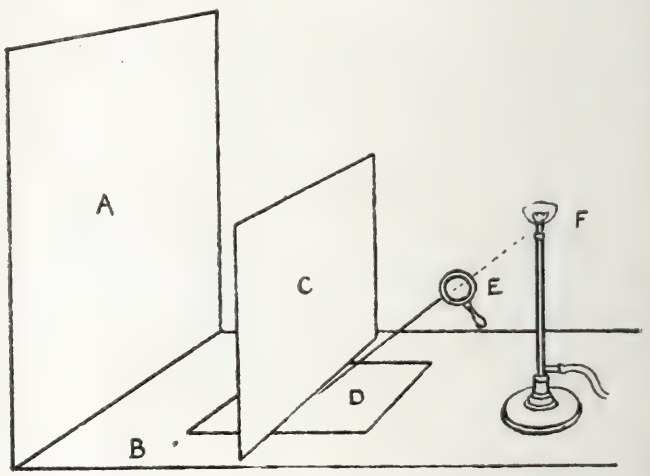


Fig. 1

diagram (fig. 1). A table is placed close up against this, also carrying a similar sheet of cardboard in a horizontal position, B. A sheet of thin wood, C, about one foot square, is also provided, having a narrow strip of black velvet along its bottom edge. In order to

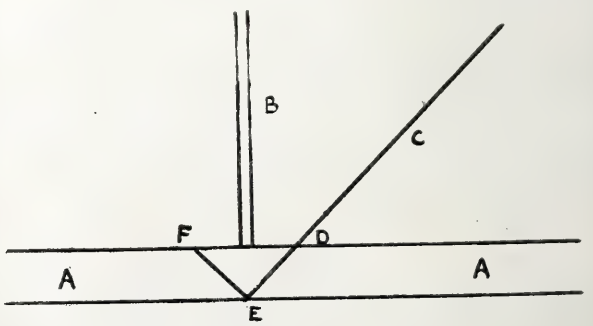


Fig. 2.

test the properties of the different backings, the plate D is laid film side up upon the table B, and the thin board C is then placed over it in such a manner as to divide it into two portions, and shield one half of it from all light. These experiments, it may be mentioned,

should be performed at night or in a darkened room. A gas burner, F, is then arranged so that a bright ray of light may be thrown upon the front portion of the plate by means of a hand magnifying glass E. These preliminaries being settled, we are in a position to notice the amount of reflection which can come from the back of any given plate. The principle underlying these experiments will be better understood by reference to fig. 2.

A is an enlarged section of the plate being examined; B is the dividing board which screens all direct light from the back half of the plate; C is the ray of light thrown from the lens as described, and impinging on the surface of the film at D. From D it will naturally pass through the thickness of the glass until it reaches the back at E, and, if the backing is not effective, we may expect it to be reflected as shown, and to appear behind the screen, on the surface of the film at F. The experiment being optical, and not photographic, we need not worry about fogging the plate by exposure to light, and, of course, no dark room is necessary.

The writer made a small collection of differently coated plates, of several brands, backed in various ways, and obtained the following rather instructive results:—

1. Ordinary thinly-coated plate without backing—result, strong reflection of light from back.
2. Thickly-coated plate without backing—reflection nearly as strong.
3. Multiple-coated plate (stated by its manufacturers to absolutely prevent halation)—result, strong reflection.
4. Plate backed with Indian ink—slight reflection.
5. Backed with caramel—slight reflection.
6. Backed with bitumen—slight reflection.
7. Backed with burnt sienna—very slight reflection, and (this is important) of a reddish tinge.
8. Celluloid film—almost as much reflection as unbacked glass plate.
9. Paper film—absolutely no reflection.
10. Celluloid film, backed—no reflection.

From these experiments it would apparently seem that the only really certain way to prevent halation is to use paper films or backed celluloid, also that the best backing for plates is burnt sienna, not only on account of the very small amount of reflection possible, but, with regard also to the fact of its reflecting light, if at all, with a reddish tinge, and so rendering it non-actinic.

The test described is, perhaps, rather a severe one, for probably no rays of light so strong as that from the magnifying glass would ever reach a plate through a lens in actual practice, but it must not be forgotten that the sensitiveness of silver bromide to light is much greater than our eyes are capable of, and a far slighter reflection than would secure our attention visually is sufficient to cause objectionable results photographically. We must also bear in mind the important factor of time. In many instances the subjects where halation is to be feared are interiors requiring a prolonged exposure, and a very slight reflection has, in this time, sufficient opportunity for mischief. It is obvious therefore that the method which absolutely prevents reflection in any circumstances is that to be sought after.

A. Lockett.

HINTS TO BEGINNERS IN LIMELIGHT PROJECTION.

III.

In a previous article it was pointed out that one of the first essentials for a beginner to practice was "personal attention" to the condition of his apparatus, and not only must this embrace careful scrutiny of every part when at home, but such personal attention must be bestowed on his apparatus whilst travelling. Railway servants are not the most careful handlers of luggage, and many of them will be found even reckless in throwing passengers' and other luggage in and out of vans. A very small matter will be sufficient to upset a lantern display, or at least to cause a large measure of trouble and annoyance in the way of putting right something that has gone wrong in transit. With gas cylinders there is a liability to cause breakdowns by their suffering damage in transit, and it is a question, if the regulation matting accepted by the railway companies as a sufficient protection to same in transit, is really an efficient means of packing them for an ordinary journey by rail or road. The vital portion of a gas cylinder is its nozzle, and the matting usually employed to encircle the body of the cylinder proves no protection against injury to such parts. A much safer course to follow is to make a fixed rule of packing all cylinders in strong wooden boxes, where they have to be sent any distance at the hands of strange servants. Not once, nor twice, has the writer of these articles met with instances where cylinders sent on in advance from the works, and packed by means of matting, were found on arriving at their destination to be in a damaged condition, their nozzles not permitting regulators or taps being screwed on. A more annoying circumstance than this can hardly be conceived, and professional operators know well the importance attaching to the condition of their cylinders. Therefore many of them make a point of packing them in specially designed cases. These are strongly screwed together, and bound at the corners by metal straps. Such cases serve a double purpose; not only do they provide for the safe transit of the cylinder, but they at the same time yield an efficient stand for the lantern to be worked from. It follows these cases require to be made of very strong boarding, and to be fitted with iron latches and padlock, as well as strong leather straps when in transit.

These cases are capable of carrying, in addition to the cylinders, which are rigidly held in position in the box, all the other requirements of the lantern outfit, the lantern being packed in a case specially designed for the purpose by itself, and free from anything that could possibly injure it. A beginner will not be long in finding out that the packing of his outfit is not the least of the many little troublesome items he will have to face, and a little thought bestowed in designing and providing a really safe and efficient cabinet, by means of which he can rapidly repack his outfit after an entertainment, will dispense with much discomfort, which otherwise is certain to be experienced. When an efficient travelling case is provided for the cylinders it will be found that more than half the trouble in packing is overcome, and the time taken to bundle up to catch a late train but very little, for the cylinders being in their cases with their regulators, tubing, and everything else, fixed in an immovable position, can be padlocked in a second or two, strapped, and handed out to the attendant for transit in no time.

Many operators when driven to what is termed a close thing in the way of catching the last train, make a point of gathering together and actually packing up during the time the lantern is showing, by adopting a well-conceived system of packing, and having a place for everything, and a few roomy pockets in their coats. It is surprising with what rapidity an outfit can be bundled up and placed in a cab in waiting outside. This can only be accomplished by making a point of seeing that everything is in its place beforehand in the cabinet and rigidly fixed, and also carefully replacing the slides as they come from the carrier back into the box in their proper order. When this is attended to there is no delay in gathering together the slides or replacing them in their boxes in an out-of-order condition.

One of the most anxious items with every operator will be found the erection of his screen. Here, again, a personal acquaintance with the details of his frame and sheet will tend to make an otherwise difficult job easy of performance. With small-sized screens, say, from nine feet downwards, it is merely child's play, but when it comes to sixteen feet and upwards, then, at least, a couple of hands should be engaged. For frames, there is probably nothing better than one-inch bamboo canes where much travelling has to be performed, and where there is space and suitable feet provided. A sheet of ordinary size can be tied on the frame, and guyed up in a very brief space of time. Unfortunately, however, screens have at times to be erected in difficult situations, where feet cannot be used, then only experience and common sense can guide an operator what is the better plan to follow. In folding a sheet it should be always seen that this is done the long way of the seams, and nothing should be more carefully attended to than seeing that it is drum-tight on the frame. If the latter, by reason of the poles being too thin, will not permit of the sheet being tied tightly up without bending the poles unduly, then by means of cords attached to the poles, the latter should be strained outwards after the sheet is tied on. This invariably helps to make a drum-tight screen. A dirty sheet is an abomination, and any tape that comes to grief should at once be replaced. A careful operator will not wait to do this, but will have a needle and thread with him, and do it at once. The practice of puncturing a sheet and running

through a piece of twine instead of sewing on a tape betokens a careless operator, and it has come to be known as a stock saying that an operator can be judged by the condition of his sheet. An accident will happen now and again in travelling, where a sheet will suffer in transit by wet and storm, but this does not apply to a generally dilapidated condition of patches and blemishes. Of course, in all large businesses where numbers of operators are sent out nightly now and again an operator will find things not just as he would like them, by reason of his having to make the best of the apparatus he has to use; but with most operators who may be said to work their own apparatus, a clean sheet, and in good condition, is a sine qua non. For larger sizes of, say, twenty feet, some operators of experience have a decided preference for erecting the sheets by means of ropes only, or, where there is time and facilities at hand, using two lengths of stout timber, which any local carpenter will supply. Where several exhibitions have to be given in the same place, and the sheet can be permitted to remain undisturbed for a length of time, such a method works well. The lengths of timber are easily bolted together if desired. It is only, however, in special situations, and where large sizes are concerned, that recourse has to be had to the village carpenter. For general all-round work a twelve-feet sheet will be found the best, and stout bamboo poles run through suitable feet and guyed up the sides will be best for any beginner to start with. These, along with the sheet, which should be provided with a waterproof cover when folded up in suitable lengths, should all pack away in a strong travelling case. When an operator has his screen erected he has overcome his chief difficulty, and, feeling assured that his apparatus is sound in every part, he can approach his work with an absolute certainty of success and pleasure, and it only remains for him to erect his lantern at that distance from the screen which, with the focal length of objective he is going to employ, will yield a disc the size he desires.

In selecting a size of picture or disc it is well he should follow a well-recognised rule as to what constitutes a proper or the best size of picture to show. In arriving at this decision, he must be guided by the size of the room or hall he is working in. And, also, if possible, invariably form a fixed determination to work from the back of the hall or audience. There are good reasons for adopting this situation, one of which being the audience is never annoyed with stray light or any interruption of the view, as would happen in the case where a lantern was erected in front or in the middle of them; and, further, when working from behind his audience an operator will be enabled to do his manipulations unseen by those forming the audience. Having therefore acquired some knowledge beforehand as to the dimensions of the hall he has to work in, it is always desirable to provide for a picture whose dimensions are one-fourth the longest side of the hall. This rule as to the most suitable disc to provide for any room or hall will, when fully considered by any beginner, be found to yield the best possible results, and such objectives should be employed as will give this size of picture by working the lantern from the back of the hall or audience. The beginner who closely reasons out by calculation what is the best focal length an objective should possess to provide a picture according to this rule, will find a lens which has a focus of twelve inches will more nearly accomplish such under any or every circumstance than any other. It matters not whether the room be small or the hall large, a twelve-inch lens will come nearer the fulfilment of this requirement than any other when employed at the rear of an audience. Most lanterns designed for home use have their objectives much too short in their focus. This is accounted for in this way. It frequently happens that such non-professional lamps are designed for use with other illuminants than the limelight, and such objectives and lamps are, as a rule, worked at a short distance from the screen, right in front of an audience, with all the discomfort of glare, etc., to the eyes. By substituting a lamp capable of carrying a twelve-inch objective and projecting the picture from a greater distance an equally large disc is yielded without such discomfort, and there are other reasons in favour of the employment of long focus objectives over shorter ones that a beginner will soon appreciate. When employing these long focus objectives care should be observed to adapt suitable condensers to them, i.e., the condenser should be slightly longer in focus also. By this means there is not such liability to fracture them by heat from the lime, for the latter is not brought so closely up to the back of the condenser when working.

A. T. Newton.

A ROYAL CINEMATOGRAPH ENTERTAINMENT.

The following is the programme of the cinematograph entertainment, given by command and in presence of the King and Queen, her Royal Highness Princess Victoria, and other members of the Royal Family, at Balmoral Castle on Monday evening, October 14, 1901, by Fraser and Elrick, Opticians and Photographic Dealers, Edinburgh:—

List of Subjects.

Part I.—South Africa and the Return of our Troops from the War.—1, South African Railway Scene—"To the Front. 2, Royal Engineers' Construction Train. 3, Balloon Section Crossing a River. 4, Crossing a Drift with a 4.7 Gun. 5, Lord Roberts' Triumphal Entry into Kroonstadt. 6, An Ostrich Farm. 7, Arrival Home of the Naval Brigade from Ladysmith. 8, Naval Brigade at Gosport. 9, Reception of Captain Percy Scott and the Men of H.M.S. "Powerful," with the Guns they used in Ladysmith. 10, Return of the C.I.V.'s and their March through the Streets of London. 11, Patriotic Tableau: Britain's Welcome to her Sons. 12, Union Jack Ensign.

Part II.—Incidents in the Cruise of the "Ophir."—13, King Edward, the Duke of York, and members of the Royal Family passing along the Jetty, between the "Victoria and Albert" and H.M.S. "Ophir." 14, The Royal Travellers proceeding on Board. 15, His Majesty the King bidding farewell to and shaking hands with Officers of H.M.S. "Ophir," previous to their departure. 16, H.M.S. "Ophir" steaming out of Portsmouth Harbour conveying the Duke and Duchess of York to the Australian Colonies, being preceded by the Royal Yacht "Alberta," with their Majesties the King and Queen aboard. 17, The Royal Yacht and Escort. 18, The Arrival of the Duke and Duchess of Cornwall and York at Melbourne, Australia, on the 6th of May, 1901. 19, The Governor-General (Lord Hopetoun) and the Duke and Duchess of Cornwall and Staff going to open Parliament at Melbourne, 9th May, 1901. 20, Parade of Trades and Friendly Societies before the Duke and Duchess of Cornwall and York, at Melbourne, 11th May, 1901. 21, Arrival of the Duke and Duchess of Cornwall at Sydney, 27th May, 1901—Leaving the Domain and passing into College-street. 22, The Great Review of Australian Field Forces before T.R.H. the Duke and Duchess of York at Centennial Park, Sydney, Australia, 28th May, 1901. 23, Laying Foundation Stone at Ballarat of the Monument to the Soldiers who have fallen in South Africa. 24, Panorama of Sydney Harbour, showing Crowds waving farewell.

Part III.—Opening of Parliament and Miscellaneous Subjects.—25, Panorama of Windsor Castle. 26, Opening of the First Parliament of King Edward VII.—Procession along Whitehall. 27, The Scene at the Houses of Parliament. 28, The Royal Visit to Netley Hospital. 29, Arrival of His Majesty the King at Ballater. 30, His Majesty's Inspection of Highlanders composing the Guard of Honour. 31, Departure of the King from Ballater en route for Balmoral. 32, His Majesty the King in Edinburgh. 33, Their Imperial Majesties the Czar and Czarina of Russia at the Review at Betheny, France. 34, Launching of Santos Dumont's Navigable Balloon at Paris. 35, Launch of the "Celtic." 36, "Brighton Queen" passenger ship embarking passengers and steaming full speed ahead.

Part IV.—Various Subjects.—37, The Village Blacksmith. 38, A Laughable Street Incident. 39, Brickbuilding. 40, Children at Play. 41, The Maypole Dance. 42, Gossip over the Tea Cups. 43, Skating in Switzerland. 44, "Shamrock" Becalmed and being Towed by the "Erin." 45, Mysterious and Marvellous Fishing. 46, Masks and Faces. 47, Love in a Tub. 48, Miller and Sweep. 49, Stop Thief! 50, Indian Jugglers. 51, The Magic Extinguisher. 52, The Clown Barber. 53, The Little Chinese Girl. 54, Britannia.

In distributing the prizes at the Royal Technical Institute, Salford, on Friday last, Sir Henry Roscoe said it had often puzzled him to account for the singular apathy with regard to education which in times past, and to some extent even now, had characterised the average Englishman. Surely one would think that he of all men, dependent as he was for his very existence on his successful solution of problems relating to industry and commerce, would have felt it not merely an advantage, but an absolute necessity, that his knowledge and training should be as perfect and widespread as possible, just because the arts and trades which he practised had their foundation in artistic or scientific principles, and could only flourish satisfactorily under the guidance of those principles—that was, under educated effort.

MONTHLY SUPPLEMENT

[THE LANTERN RECORD]

To the "British Journal of Photography." *December 6, 1901.*

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ZONAL ABERRATION AND ITS CONSEQUENCES.

[Abstract of the Fourth Traill Taylor Memorial Lecture.]

Great as have been the advances in geometrical optics during the last quarter of a century, they remain for the most part outside the general run of text-books of physics or even of optics, unknown or ignored. Various causes have contributed to this neglect or ignorance on the part of those who write these text-books. Amongst them may be named the examination-blight which, like the phylloxera, has poisoned the healthy growth of science; the inept tutorial system of the older Universities, which is a prime factor in discouraging research; the circumstance that many of the recent optical advances have been made by men not of our own nation, and whose memoirs are written in another tongue; and lastly, the significant circumstance that these advances have almost without exception been the result of the technical applications of the science, tke consequence of a recognition of practical needs in the manufacture of the microscope, the telescope, or the camera, and therefore outside of the range of the paper science alike of the text-book writer and of he University tutor.

In no department of geometrical optics has the advance been more marked than in the study and treatment of aberrations of lenses. The demand of the astronomer for improvements in the telescope, of the biologist and histologist for improvements in the microscope, of the photographer for improvements in the camera, have successively compelled the study of aberrations from different standpoints. For the telescope the removal of chromatic aberration in the first place, and of central aberration in the second place, were almost sufficient. For the microscope a more complete achromatisation was not in itself sufficient; it was necessary also to strive after flatness of image, and avoidance of the aberrations due to diffraction. For the camera something more was needed. Achromatic performance was certainly desirable, and so was flatness of field; while diffractional aberration was relatively unimportant. Yet in the camera it no longer sufficed to correct the lens, as in telescopes, for central aberration only. It was necessary to take steps to secure marginal definition as well as central; to give that definition over a wide angle of view; to avoid distortion of the image in its own plane; and—most difficult of all—to fulfil all these conditions while having a large aperture relatively to the focal length. This last condition, as is well known, is the condition for admitting a large quantity of light so as to make the lens rapid in its action. If only the lens might be stopped down to a very small aperture, almost all the aberrational difficulties vanish of themselves. But if rapid performance (that is with a wide aperture), and accurate performance over a wide angle of field, are set down as primary conditions to be fulfilled, then the aberration difficulties can by no manner of means be disregarded or shirked. The simple cures that sufficed a century ago for the telescope—and they are all that the paper-science of the text-books deigns to acknowledge—are wholly inadequate. Under the new conditions new forms of aberration, insignificant under the old conditions, force themselves into view. Their removal cannot be effected without deep study of their cause, and clear insight into their nature. New designs of lenses must be thought out and tried; and even to-day the design of such lenses is as much a fine art as a science: it is the art of optical compromise; the art of attaining a good working lens by setting some of the inevitable aberrations to balance the others; the art of attaining sufficient perfection in some one respect by deliberately sacrificing perfection in some other direction.

Amongst the aberrations which have thus asserted themselves in the case of camera lenses, that is to say, which have asserted themselves because of the necessity of using lenses of wide aperture and at the same time of letting light go through them very obliquely so as to take in a wide angle of view, there are two that have not even been mentioned in the foregoing brief review. These are *zonal aberration* and *radial astigmatism*.

Zonal aberration makes itself known by producing the effect called by photographers *coma*. This defect is easily described and shown. Take any ordinary positive lens—say, a plano-convex—and cause it to form an image on a white screen of any small, bright object, such as a small glow-lamp, placed, not on the axis of the lens, but away at one side of the field of view. The image will be found to be distorted into an ovate, or pear-shaped, or comma-shaped blur, from which the origin of the name *coma*. The zonal aberration which is the cause of coma will be the principal topic of the present lecture.

Radial astigmatism is also an aberration which besets the oblique pencils of light. If a lens have this defect, the margins of the image which it throws on the screen will be blurred, every bright point in the marginal region being turned into a little streak, with the peculiarity that, if the focussing screen is too near the lens, these streaks will all be set tangentially around the centre of the picture, while, if the focussing screen is too far from the lens, the streaks will all point radially toward the centre. The simple fact—studied by Airy, Coddington, and Herschel sixty years ago—is that any and every lens not specially corrected for this defect, even if corrected for chromatic aberration, for central aberration, and for zonal aberration, does not bring an oblique or "secondary" beam stigmatically to focus at a single point, but so acts on it as to produce two focal lines, lying in space at different distances from the lens, the first (or nearer) focal line being situate tangentially with respect to the axis of the lens, and the second radially. In other words, the oblique pencil is no longer homo-centric. It still follows or surrounds its central oblique axis, but the rays from above and below meet one another at a different distance from the lens from that at which the rays from right and left meet one another. It is the aim in all the modern so-called "anastigmatic" or "stigmatic" lenses to get rid of this defect of astigmatism, the lens being designed so as to merge these two focal lines into a single focal point. This phenomenon of radial astigmatism is fairly well known, though some authors, by merely calling it "astigmatism," cause confusion, since astigmatism proper is the defect due to cylindricity. The many

authors who have written on photographic optics during the last forty years, Petzval, Bord, von Seidel, Monckhoven, and, by no means least, the late Mr. Traill Taylor, have dwelt much on these astigmatic phenomena. There is, therefore, no need to emphasise them here; but, inasmuch as coma and radial astigmatism are both of them aberrations which beset oblique pencils, they usually coexist and have to be studied together. Nevertheless, they are essentially two different phenomena, arising from different causes, requiring separate consideration, and requiring different remedies. If both defects are present in any lens, then in no position of the screen will the two focal lines appear strictly as lines, but will be ovate patches, or, in some cases, shaped like elongated figures of eight. If zonal abberation has been really corrected, the two focal images will appear in narrow, well-defined, short lines.

The name *zonal aberration* is intended to imply an aberration which results from the various zones of the lens being of different power, producing unequal magnification. To make clear the point in issue, let us admit two preliminary suppositions:—First, that chromatic aberration does not exist in the lens in question. To fulfil this condition we must either suppose some perfectly achromatic construction, or else that only a monochromatic light is employed. Secondly, let it be granted that central aberration (commonly called in the text-books, spherical aberration) has been removed. In other words it is assumed that, by the choice of a suitable figure, Euler's condition has been fulfilled, and that, for a parallel beam of light incident axially, the lens produces perfect concentration at the principal focus. This is only another way of saying that, if the lens has been corrected for spherical aberration, all its zones agree in having the same principal focus.

Now we have got to make it clear that a lens which is so far perfect as to fulfil these two conditions—which in common parlance is free from both chromatic and spherical aberration—can yet suffer from coma. In the first place it does not at all follow that the elimination of spherical aberration at the principal focus will ensure perfect definition of focus at any other point. Consider only points on the axis. To every point on the axis where an object (a bright point) might be placed, there corresponds a conjugate point where its image will fall. Now it is possible, by choosing an appropriate figuring, to correct the lens spherically for any one such pair of conjugate points, but not for more than one. In the ordinary telescopic case, the object is practically at infinity, and the image at the principal focus. But if spherically corrected for this case, there will be spherical aberration if that lens is used for any other case, as, for example, to produce an image of a bright point situated not at infinity, but at a distance equal to only two or three times the focal length. Again, considering for the moment those points only which lie in the principal focal plane, though the central one, the principal focus itself, is devoid of aberration, it by no means follows that the others will be. The ordinary correction for what is called spherical aberration, though it may somewhat help the definition for oblique parallel beams, is strictly a correction for a principal beam only, focussing centrally. That is why, to avoid misunderstanding, I have spoken of such a lens as one corrected for central aberration.

But, it may be asked, if a lens is by hypothesis such that it has the same principal focus for all its zones, from centre to edge, how can it yet suffer from zonal aberration? Remember that I have described zonal aberration as consisting in this, that the various zones of the lens are of different power, producing unequal magnification.

Here I must be allowed a short digression to make clear a point, familiar enough to all students of the recent developments of geometrical optics, though too little recognised in the belated optics of the text-books, that there is a difference between the apparent focal length of a lens, and its true focal length upon which its power depends. Two lenses may, for example, have their respective principal foci at equal distances from the back surface of the lens, and yet they may magnify quite differently. Every photographer knows that his camera objective, which has a principal focus at, say, four and a half inches from the surface of the lens, will not produce a picture of the same size as a thin lens of four and a half inches focus, but will probably act more like a thin lens of six inches focus. In the theory of Gauss which deals with the theoretical properties of an ideal lens, never realised perfectly in practice, this difference in magnifying power between two lenses that have the same apparent focal length is explained by a geometrical artifice; the refraction exerted by the lens upon a given ray parallel to the principal axis being referred back to an imaginary surface which in Gauss's theory is considered always as a plane and called a principal plane (*Haupt Ebene*).

Thus in the diagram fig. 1, in which the effects are purposely exaggerated, let a parallel ray enter the lens at A_1, instead of emerging in the direction of B_1 it is refracted first on entrance at A_1, secondly on emergence at C_1, so that it cuts the axis at F_1. Let now the final part of the ray $F_1 C_1$ be produced backwards, until it meets the line $A_1 B_1$ in the point D_1. The lens, in fact, produces on this particular ray the

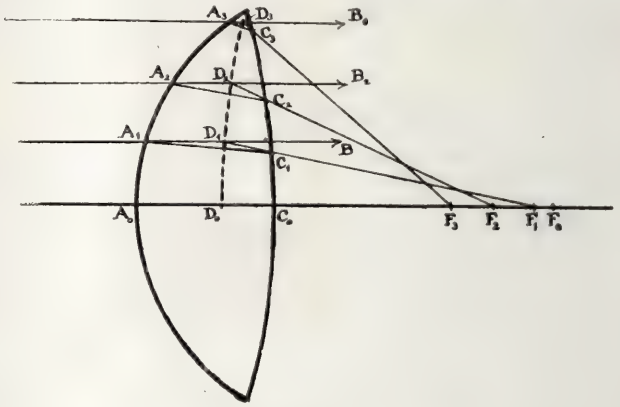


FIG. 1.

same effect as if the light had gone straight on from A_1 to D_1, and had then abruptly turned from D_1 down to F_1. Now, if the same construction is made for a number of rays which meet the lens at different distances from its axis, we obtain for each its own point D. The surface in which all these points lie is the "principal surface."

It obviously passes through the outer edge of the lens, since at the edge the points A, C, and D, come indefinitely near together. The form of this surface will obviously depend on the curvatures of the two faces of the lens; there will also be in every lens two such surfaces, one for a parallel beam in one direction, the other for a parallel beam in the other direction. It is also obvious that to assume, as Gauss did, that in every lens each principal surface is always a plane, is very far remote from actual facts. With this diagram before us let us consider anew the problems of aberration. To avoid complication let us consider that chromatic aberration is absent; or that the light that is being used in monochromatic. In the first place if the effect of the various zones is to produce (as shown) different points of intersection with the principal axis at F_0 F_1 F_2 &c., there is present the defect of central aberration, commonly called spherical aberration. If the lens has been proportioned according to the well-known rule of bending over the curvatures of the faces so that the curvature of the first face is about six times that of the second, then this central aberration will be a minimum for parallel rays, and the points F_0 F_1 F_2 &c., will practically coincide.

But, even then it will be evident that though such a lens possesses the same focal point for all its zones, those zones are not necessarily all equal in their magnifying power; for they are not all at equal distances from the focus.

Only if the principal surface in which lies the points D_1 D_2 D_3 &c., is itself a portion of a sphere concentric around F_0, will each zone have the same *true* focal length as each of the others. In other words, if this surface is not a sphere, the size of the image at F_0 of an object (for example, the disk of the sun and moon), will be different for different zones of the lens. The image due to rays that traverse one zone of the lens will overlap that due to the rays that traverse another zone; but they will not coincide accurately. This defect is that to which the name of zonal aberration is given.

If a lens consisting of one piece of glass only is corrected as well as possible for central aberration, it will not be corrected for zonal

aberration, and *vice versâ;* for the conditions are different. To correct both defects at the same time will require more than one piece of glass to be used. It is possible in the case of achromatic doublets, made of two different qualities of glass, to choose the four

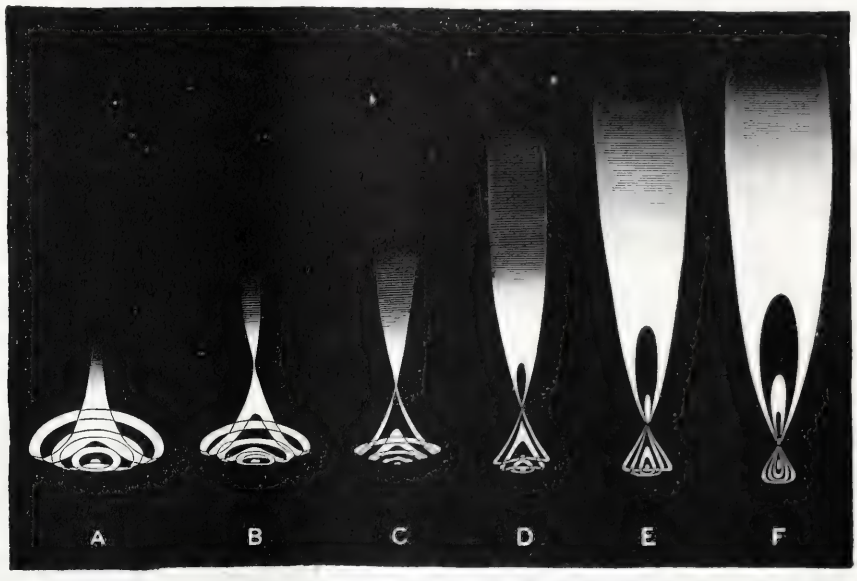


FIG. 2.

faces, so that both central aberration and zonal aberration shall be approximately corrected.

Abbe has proposed to reserve the term "aplanatic" to denote lenses which fulfil *both* these conditions. Abbe has also shown that the elimination of zonal aberration is dependent upon the fulfilment of the so-called sine-condition.

As remarked previously, zonal aberration, if present, makes itself known by the effect called *coma*, the pear-shaped blur that does duty for focus for an oblique pencil; but the coma will be somewhat worse if central aberration is also present, since any want of definition

beyond it a source of light that is approximately a point; let this luminous point be on the principal axis of the lens. By moving the lens toward or from the screen a position can be found—provided the light itself is not too near to the screen—where the lens casts a focussed image inverted and diminished in size upon the screen. Assuming the lens to be perfect, the image of a point ought to be a point. But even an achromatic and aplanatic lens will not necessarily yield a perfect point-image at the centre of the field, because, though at the centre of the field *all* aberrations are less than at the margin, the lens can be made aplanatic only for one particular pair of conjugate points, which may not happen to be the pair occupied by object and image. That all aberrations are less at the centre of the field is due to symmetry in the conditions. If the object is displaced laterally so that the axis of the incident pencil becomes



FIG. 3.

in the focus of an axial beam is augmented if the incidence of the beam be made oblique, and it increases rapidly with the obliquity of the incidence.

It will be useful to devote some attention to the phenomenon of coma itself, without troubling at first as to how far it is due to purely zonal, or how far to central aberration. Take any ordinary simple magnifying lens; place it in front of a white screen; set

oblique, the image moves away also from the centre of the screen toward the margin, and at the same time the various aberrations are increased. With any ordinary lens the most obvious effect is the elongation of the image into a pear-shaped, or comet-shaped blur, the *coma* to be discussed. Now this blur in the image, formed thus obliquely, cannot be got rid of by refocussing. Moving the screen nearer to the lens, or further away, may change its shape or the con-

centration of light in its parts, but will not cause it to contract to perfect focus at a point. Tilting the screen at an angle may also affect the form; but in no position of the screen will the image be rendered as a *point*. The simple fact is that the rays of the pencil that emerges obliquely from the lens are no longer homo-centric. Covering the lens with a diaphragm pierced with a round hole, it will be found, by moving it about, that in certain positions it improves the definition of the image by cutting off the more aberrant of the rays. A little examination will show that the different zones of the lens are focussing at different points in space, and that in the case of all the outer zones of the lens the different parts of the zone are acting unequally owing to want of symmetry in the oblique incidence of the beam.

Instead of displacing the luminous object laterally we may more conveniently produce the same result by simply tilting the lens. If we tilt the lens 30° the effect is the same as if both object and screen had been moved through an equal angle with respect to the axis of the lens.

Setting a lens thus obliquely in front of a powerful source of light such as an arc-lamp, we may proceed to study the zonal effects in several different ways. In the first place we may stop off with opaque varnish some one zone of the lens, and observe the result upon the emergent beam of light. Or we may stop off similarly the whole of the lens except one single zone that is left exposed. Or we may affix against the face of the lens a *zone-plate*, made by painting concentric rings in black varnish upon a glass plate of equal size. Or, lastly, we may interpose diaphragms or other opaque objects in the path of the emergent beam, at points not in proximity to the face of the lens, but at some distance from it, and observe the shadows cast on a screen by such interposed objects.

Such experiments have been made in numerous ways with a number of different lenses, tilted at different angles, and with incident beams of varying kinds, some divergent, some parallel, some convergent. From these experiments a few are selected as examples.

First Series of Experiments: Zonal Study of a Plano-convex Lens.

The plano-convex lens used is one having a focal length of about 19½ inches, and a diameter of about 7½ inches.

A zone-plate consisting of a disk of thin glass, upon which were painted in black varnish concentric zones of equal width, was fitted to the lens. It was placed in front of an arc-lamp which furnished a divergent beam of light. It was arranged so that it could be tilted about its horizontal diameter to any desired degree of obliquity, and the beam which traversed it was explored by means of a white semi-transparent screen, set vertically, so that the axis of the beam met it normally. This screen was first placed in close juxtaposition to the tilted lens, and in this position the forms taken by the distorted annular patches of light transmitted through each of the several zones of the lens were delineated on the screen, tracings of their outline being preserved. The screen was then moved a short distance away, and another tracing taken. This operation was repeated at regular distances from the lens, the series of pictures of the aberrations due to the zones of the lens being thus obtained experimentally. (Figs. 2, 3, and 4 illustrate the results of Professor Silvanus Thompson's experiments.)

The Theory of Zonal Aberrations.

In the year 1889 an exceedingly valuable contribution to our knowledge of the phenomena of zonal aberration was made by Dr. A. Steinheil[1] in a study which he made of the refraction of rays through the objective of the celebrated telescope made by Fraunhofer for star measurement at the Observatory of Königsberg. This objective is an uncemented achromatic system of one flint and one crown glass. The diameter of its aperture is 144 millimetres, or approximately 6 inches, and the distance of its principal focus from the vertex of the last surface is about 2261 millimetres, or about 88 inches, the true focal length for axial rays being about one-third of an inch greater. With that extraordinary patience, precision, and skill which characterises all his work, Dr. Steinheil proceeded to calculate the zonal aberrations for this lens in the following manner. He considered the surface of the lens as mapped out into zones, and chose 25 points, one at the centre, 8 at equidistant points round the outer edge, and 8 others on each of two intermediate concentric circles, making 25 points in all. Assuming a ray, parallel to the axis, to fall on each of these 25 points, he proceeded, by the aid of the trigonometrical formulæ of L. von Seidel,[2] to calculate the exact paths of each ray, and to find the place where it intersected the focal plane. The whole of the elaborate calculation was then repeated for a similar set of rays parallel to an oblique axis. The obliquity chosen was slight, being such that the oblique axis intersected the principal axis at only 48′ of arc, or would give on the focal plane an image about 32 millimetres away from the centre. For photography of star groups, or for heliometric measurements of the stars (for which the Königsberg instrument was specially designed) it is desirable that even in the case of such small angular distances from the axis as this, the images of stars should be as free from

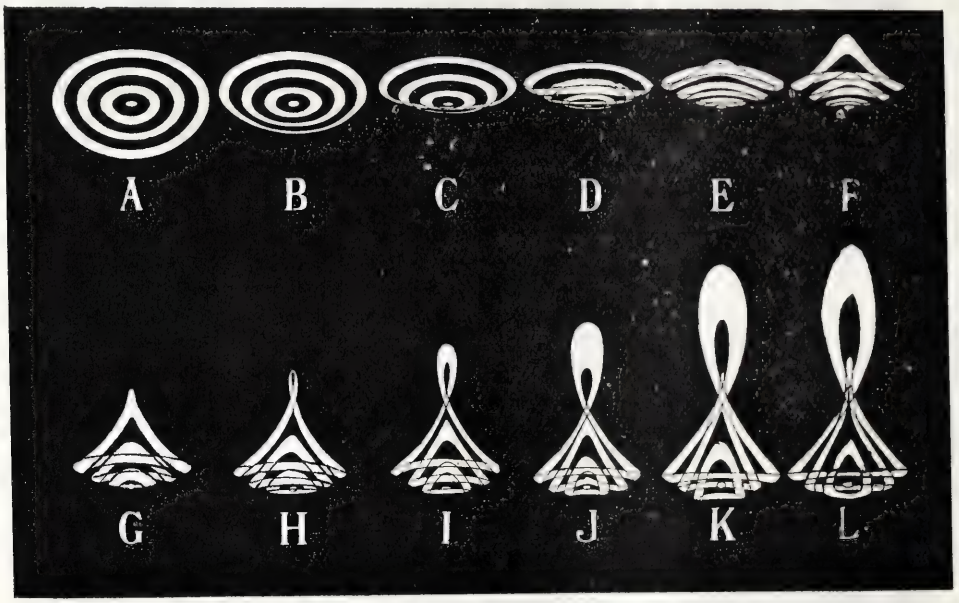


Fig. 4.

[1] Dr. Adolf Steinheil: Ueber den Einfluss der Objectivconstruction auf die Lichtvertheilung in seitlich von der optischen Axe gelegenen Bildpunkten von Sternen bei zweilinsigen Systemen.—"Sitzungsberichte der k. bayerischen Akademie der Wissenschaften," Bd. xix. page 413, 1889.

[2] L. Seidel: Trigonometrische Formeln für den allgemeinen Fall der Brechung des Lichtes an centrirten sphärischen Flächen.—"Sitzungsberichte der k. bayrischen Akademie der Wissenschaften," November 10, 1866, page 263.

aberration as possible. The results of the calculation were plotted on a scale enlarged two thousand times, and were published in the plates accompanying Steinheil's memoir. The calculations were made for yellow light only, no account being taken of secondary spectrum or of diffraction. It was known that the lens was not entirely free from spherical (i.e., central) aberration, and the calculation showed that there was also zonal aberration present. The following are the figures:—

	Distance of Focus from Back Face.	True Focal Length.
For lens centre	2261·6792	2269·1862
For zone at $\frac{1}{3}$ radius	2261·6666	2269·2301
For zone at $\frac{2}{3}$ radius	2261·6293	2269·3635
For zone at periphery ..	2261·5722	2269·5883

The values are in millimetres, whereas in Steinheil's memoir they are given in Bavarian lines. Simple inspection of the figures will show that the lens was under-corrected for spherical aberration, the distance of the focus for the peripheral zone being slightly less than for rays through the centre, while the centre had really a slightly shorter true focal length, or, in other words, magnified a little more than the peripheral zone. Fig. 5 gives the forms of the aberration

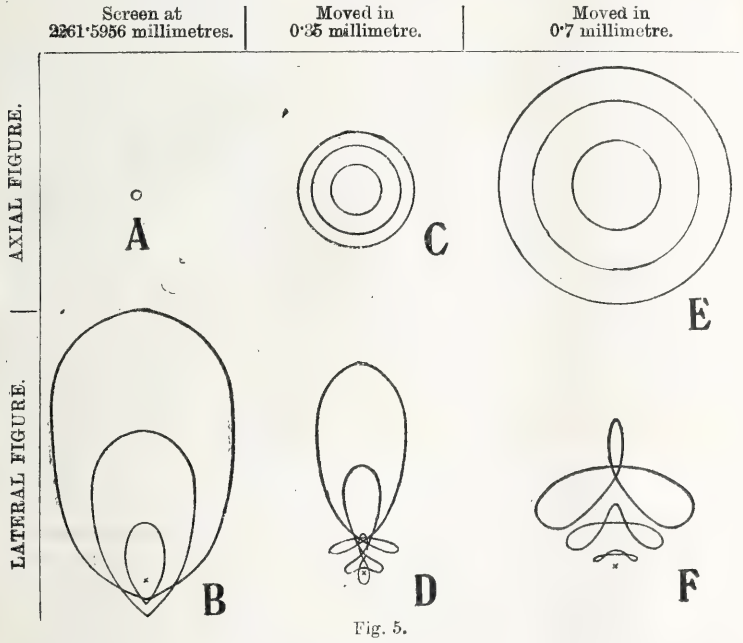


Fig. 5.

curves. The small circle at A shows the least circle of aberration at the principal focus on a screen placed at 2261·5956 millimetres distance, while at B is shown (on the same scale) the coma for the oblique ray at 48′ as described. The screen was then moved nearer to the lens, or, rather, the calculation was applied to ascertain the figures that would be so formed on the screen if moved nearer to the lens by 0·351 millimetre. Here C depicts the central, and D the oblique aberration figure. On displacing the screen a second time by an equal amount toward the lens, the two figures changed to E and F respectively. The similarity of these calculated figures to those obtained in the experiments already described is self-evident. Critical examination of these figures reveals several points. Fig. 5, C, and fig. 5, E, shows also, though less obviously, that the lines of the several concentric zones are not equi-distant; the middle part of the lens magnifies more than the peripheral part does. Fig. 5, F, shows an arrangement of the zonal patches almost identical with that found in fig. 4. But the one was obtained with a minute obliquity of 48′, at a place 0·7 millimetre short of the principal focus, and was $\frac{1}{40}$ of a millimetre in its greatest width, while the other was obtained with an obliquity of about 30°, at a place much nearer to the lens than to its principal focus, and was over five inches in width.

After obtaining these results, Dr. Steinheil, remarking that the Fraunhofer objective was not completely corrected for spherical aberration, proceeded to redesign the lens, leaving the crown glass absolutely unchanged, but slightly changing the curvatures of the flint lens, so that the refraction was slightly less equally divided between its two surfaces. The performance was then as follows:—

	Distance of Focus from Back Face.	True Focal Length.
For lens centre	2261·6876	2268·9345
For zone at $\frac{1}{3}$ radius....	2261·6856	2269·0443
For zone at $\frac{2}{3}$ radius....	2261·6834	2269·2161
For zone at periphery ..	2261·6886	2269·5872

The principal foci of all zones agree within $\frac{1}{200}$ of a millimetre, the point of least confusion being at a distance 2261·6866 from the back of the lens; the central aberration being therefore practically eliminated. But the true focal lengths of the separate zones still differ from one another, the true focal length of the peripheral zone being longer than that of the centre by 0·6527 millimetre. This being the state of things, the whole of the calculations for the twenty-five rays was made over again, the resultant forms being given on the same scale as before, in fig. 6.

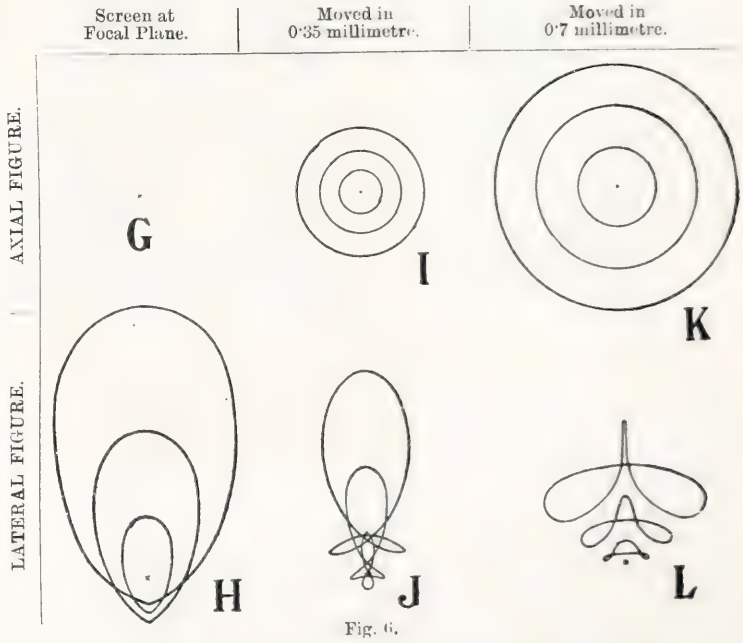


Fig. 6.

It will be seen that, though ordinary spherical aberration has been eliminated (fig. 6, G), the oblique ray still gives a coma (fig. 6, H) almost as distorted as before. The pair of figures I and J, were obtained when the screen was displaced 0·351 millimetre towards the lens; and the pair K L when the screen was displaced 0·702 millimetre. The successive zones of I and K are somewhat more evenly spaced than before; but the aberrations due to the outermost zone are actually greater. The lateral distortions of the coma in J and L are very slightly less than in D and F. It is evident, then, that curing the ordinary spherical aberration does practically nothing to cure the coma-effect from which oblique rays suffer.

But Dr. Steinheil did not stop here. He again redesigned the lens, this time altering both crown and flint glasses, so as to fulfil the conditions desired, and carried the modification out until he obtained equality of true focal length between the central and the peripheral parts of the lens. Both lenses in this change became slightly flatter, the radius of the more curved face of each of them being taken slightly longer. The performance of the lens then became as in the table on the following page.

The close agreement of the figures in the last column, shows how satisfactorily the redesigning had succeeded; since the greatest difference is but $\frac{1}{1000}$ of a millimetre, and might well be due to the

residual errors of the trigonometrical calculation. Having thus redesigned the lens to eliminate zonal aberration, as well as central aberration, for axial rays, the calculation of the twenty-five different rays for the various zones, was then, for the third time, repeated, and the results plotted as before. Fig. 7 gives these curves.

	Distance of Focus from Back Face.	True Focal Length.
For lens centre	2261·6537	2270·1853
For zone at $\frac{1}{3}$ radius	2261·6551	2270·1857
For zone at $\frac{2}{3}$ radius	2261·6568	2270·1859
For zone at periphery ..	2261·6549	2270·1849

It will be at once apparent what a change has come over the lateral aberrations. On the screen set at the place of least confusion, at 2261·6555 millimetres from the lens, the principal focal spot is only 0·00004 of a millimetre in diameter—a point, even when magnified 6000 times, on the wall diagram. The lateral figure N presents no longer a pear-shaped coma, but shows a system of ovals corresponding to the zones of the lens, with the axial point in its middle instead of being in its tail. The brightest part of this oval coma is at its centre, the light being distributed much more

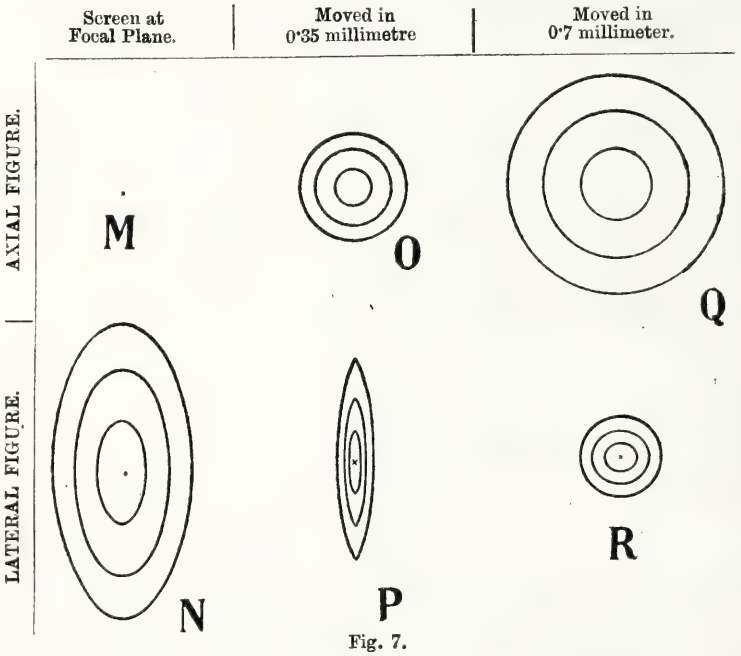


Fig. 7.

symmetrically in it. On shifting the screen 0·351 millimetre toward the lens, the central figure expands to that shown at O, while the lateral figure contracts to that depicted at P. On shifting the screen a second time towards the lens the shapes of Q and R are given. On comparing O and Q with I and K, it will be noted that they are but slightly smaller; while the lateral figures P and R have completely changed their character, having now become nearly symmetrical, and exhibiting a character of a nearly pure astigmatism. In each the distribution of the illumination is much more favourable. Steinheil himself drew the following conclusions:—

(1) That while errors in the focal point of an objective cause mainly errors in images on the axis, errors in the magnifying power of its different zones cause mainly aberrations in images formed laterally off the axis;

(2) That even small errors in the equality of the true focal lengths for middle and periphery of the lens (assuming ordinary spherical aberration to be absent), exercise considerable influence on the distribution of the light in the images (of stars or points) formed obliquely to the axis;

(3) That symmetry in both radial and tangential directions in the distribution of the light in the image is only to be attained by having the periphery of the lens of the same true focal length as the middle part of the lens;

(4) That for telescopes—and he might have added for photography—the larger the aperture of an objective the more important is it that its design should in the above respect be rigorously accurate, since the aberrations increase with the increase of size, while the sensitiveness of the eye—or of the photographic plate, we may add—remain the same.

Another theoretical study, but in a wholly different style, is the remarkable memoir of Professor Finterwalder of Munich,[3] published in 1892. This memoir is a most highly complicated mathematical investigation into the formulæ laid down forty years ago by the late Professor L. von Seidel, with a discussion of the most recondite sort upon the forms of the focal surfaces, and of the curves produced by their intersection by planes. Towards the end, Professor Finsterwalder deals with the shapes of the patches of light which in the generalised imperfect optical system are formed as the images of a luminous point, and deduces from his equations the theoretical forms of these singular ovals and twisted lines which we have seen to be the zonal images of the luminous point. He then goes on to consider the distribution of the light in these focal patches, and the changes of form which they undergo when a circular stop is placed either concentrically or eccentrially over the lens. The mathematical discussion is exceedingly deep, quite impossible of being abstracted in any simple or popular way, and not always easy to follow. He gives in some lithographed plates the forms of the zonal patches calculated for a certain meniscus lens, and for the Königsberg heliometer objective as corrected for central aberration by Steinheil.

In 1898, after the death of Professor von Seidel, there was discovered amongst his papers ready for the press, a manuscript of a communication which he had verbally made to the Munich Academy of Sciences so far back as March, 1880. This manuscript, edited by Finsterwalder, was published in the "Sitzungsberichte"[4] of the Academy. It is prefaced by a short introduction by Finsterwalder giving a history of the theory of aberrations, and of von Seidel's part therein. In the memoir von Seidel recapitulates in a non-mathematical way his older mathematical theory of the five aberrations due to form of the lens surfaces, and of the five mathematical conditions for their successive elimination. He had shown that these aberrations may be expressed as being dependent upon five expressions each of which is the sum of a complicated series.[5] Calling these five summations respectively A, B, C, D and E, he had shown that if the design of the lens system be such that A=0 then central aberration is absent (Euler's condition); that if A being = 0, B is also = 0, then zonal aberation is absent (Fraunhofer's or Abbe's condition); that if A and B being both of zero value, if C is now made = 0, then, radial astigmatism is cured; that if A, B and C being all zero, D is made = 0, then the curvature of the plane of the image is eliminated (Petzval's condition); and finally, that all the foregoing being fulfilled, if also E = 0, then the last sort of aberration, namely the distortion of the image in its own plane, will also be eliminated. He particularly, in this manuscript, rediscusses the elimination of zonal aberration, and deduces a comparatively simple form of equation to express mathematically the general form of the coma-patch, or "light-phantom," as he calls it, which is given by the periphery of any one of the zones of the lens. He shows that it is allied in form to the ephicycloid, being in fact obtained by the motion of a point around a circle, the centre of which circle is itself carried, with an angular velocity half as great, around the periphery of an ellipse. He then discusses particular cases. If A is not = 0, that is if ordinary spherical aberration is present, and if a very wide aperture is used for making images within a narrow field of vision so that relatively to A the other sums B, C, D, E are relatively small, the only coma around the image of a bright point (or star) will be a circular

[3] S. Finsterwalder: Die von optischen Systemen grösserer Oeffnung und grösseren Gesichtsfeldes erzeugten Bilder.—"Abhandlungen der k. bayerischen Akademie der Wissenschaften," Bd. xvii., Abth. iii., 1892.

[4] L. von Seidel: Ueber die Bedingungen möglichst präziser Abbildung eines Objekts von endlicher scheinbarer Grösse durch einen dioptrischen Apparat.—"Sitzungsberichte der bayerischen Akademie der Wissenschaften," July 2, 1898.

[5] Some account of these researches, and an abstract of von Seidel's calculations will be found in Appendix I. of the present writer's translation of the "Photographic Optics" of Professor O. Lummer.

disk or patch with the light most concentrated at its middle and gradated thence outwards. The epicycloid is in fact reduced to a circle. If, however, A = 0 and B is not = 0; then, provided again that the aperture is great and the angular field of vision small, the coma-patch will be pear-shaped, each zone of the lens giving rise to a circular patch, but the successive circles, large and small, will not be concentric, but will overlap so that they have as common tangents two lines mutually inclined at 60°; the peak of the figure being brightest, and corresponding to the oblique ray through the centre of the lens. (If the aberrations of higher order, C, D, and E of Seidel's notation are also present, the images for individual zones will not be circles, but distorted ovals not concentric with one another. If the conditions are such that A = 0 and B also = 0, then von Seidel shows that (neglecting all terms in the remaining aberration sums beyond those of the third order), the epicycloid reduces to an ellipse, of which the centre corresponds to the ray that passes through the centre of the lens. This is an evidence that the non-homocentric beam has attained a species of symmetry approaching to a pure astigmatism.

It is possible to illustrate to a certain extent, by experiment, some of the points thus brought out by theory. Take, for example, two simple lenses of equal size and power. One of them is a "crossed lens," that is a double convex having one of its faces about six times as much curved as the other. This form will have minimum central aberration for a parallel beam if its more curved face is turned toward the light. The other is a meniscus, having its concave face of the same radius as the less curved convex of the other lens. We will turn it with its hollow face toward the light so as to have much central aberration present. Tilt each of these at an angle of 20° from the axial position, and observe the difference between their aberrations. The addition of a zone plate to each accentuates the difference in the shapes of the coma phenomena. Now reverse the meniscus so that its more convex face is toward the light, and tilt it as before. In this position, though its central aberration is greater, its zonal aberration is less than that of the other lens. It will be found to have more nearly a pure astigmatism in the oblique beam.

Some Paradoxical Consequences.

So far as appears no writer on aberrations has discussed the question of the effect upon the coma of stopping off rays by diaphragms of other than circular shapes. The effects on definition generally of introducing stops of different sizes and at different distance along the axis of the lens are familiar to all who have begun to study the optics of photography. Eccentrically-placed stops are discussed, as just mentioned, in the mathematical disquisition of Finsterwalder. But there the matter ends. Nevertheless, there exists a class of phenomena of a very surprising kind to be observed when opaque objects of different shapes are used to stop off portions of the light traversing a lens. If, for instance, an opaque screen be held over half the surface of a lens, then in the coma or other focal patch of light there will be cut away a certain portion, the form of which may be simple or complex according to circumstances but if the same opaque screen be placed with its edge across the path of the light, not close to the lens, but at some distance beyond, it will cut off a wholly different set of rays. This observation led to the discovery of a number of cases, which are merely geometrical consequences of the zonal aberration, but which are best stated in the form of paradoxes.

Paradox I.—The Shadow of a Straight Line is a Ring.

This paradoxical result can be shown with any convex lens, preferably with any plano-convex lens, held obliquely in a divergent beam of light to produce the requisite non-homocentric pencil. With the plano-convex lens of 19½ inches focal length used in the experiments of the earlier part of this lecture the following disposition was found to give the best result. The lens was placed about thirty-five inches from the arc-lamp, and tilted about 25° around its horizontal diameter. A white screen at about five feet beyond the lens received the emergent pencil of light, and showed the usual oval-shaped coma. A thin rod of wood, such as a pen-holder, or, better still, a thin straight wire, was taken as an object to cast a shadow. It was held horizontally about 19½ inches from the lens, and raised up so as to cross the pencil of light transversely. Its shadow falls on the screen, and is observed to be a completely detached ring, not perfectly circular, but slightly pear-shaped. On raising the rod, its shadow (the ring) enlarges; on lowering it, it shuts up to a mere spot and disappears; shifting the rod toward the lens, the ring shadow descends on the screen; shifting it toward the screen, it changes form, enlarges at the lower part, opens out and exhibits simply an arched line across the screen.

Paradox II.—The Shadow of a Grid made of Horizontal Bars is a Series of Concentric Rings.

This is a mere variant of the preceding: the bars of the grid corresponding to different positions of the horizontal rod.

Paradox III.—The Shadow of a Vertical Line is a Cross with Drooping Arms.

To obtain this effect a narrow rod or straight wire is held vertically across the non-homocentric pencil at a place more distant from the lens than in the preceding case. The explanation is less easy to trace out. The vertical bar of the cross is obviously necessitated by the bilateral symmetry of the whole system. The two



Fig. 8.



Fig. 9.

drooping arms are due to the circumstance that, in the position chosen the vertical rod intercepts also some rays from certain parts of the lens, right and left of its median line, which happen to have their place of intersection (in a sort of focal line) just at the point in space where the rod is set. On shifting the rod a little towards the lens these drooping arms move downwards on the screen. On shifting it towards the screen they move upward.

Another way of exhibiting Paradoxes I. and III. is to substitute for the opaque rod a narrow straight slit, such as may be made by gumming upon a sheet of glass two sheets of paper, with a space about three millimetres wide between them. This held horizontally across the non-homocentric pencil throws upon the screen as its "shadow" a bright ring; or, if appropriately held vertically, gives the cross bright on a dark ground. This modification is preferable for showing the paradoxes which follow.

Paradox IV.—The Shadow of a Horizontal Line is a Figure-of-Eight.

To exhibit this effect, the plano-convex lens previously mentioned is set as follows: the arc lamp is placed seventeen and a half inches from the lens, therefore just within its principal focus on that side, giving an emergent beam that is slightly divergent; the convex face of the lens being towards the light. It is then tilted about 30°. If now a horizonal rod be held across the emergent beam at a point about twenty inches from the lens and at a suitable height it will cast a shadow like fig. 9, being a figure-of-eight of which the lower half is not quite symmetrical with the upper half, being rather flattened at the base. The effect is better seen by substituting the horizontal slit mentioned above; the figure-of-eight then being cast luminous upon a dark background. On raising the object the upper part enlarges while the lower part of the "shadow" becomes more triangular. On lowering it the upper part contracts while the lower contracts more and disappears.

PARADOX V.—THE SHADOW OF A HORIZONTAL STRAIGHT LINE IS A TRIANGLE.

If the same disposition of lens and screen be preserved, and the horizontal object is placed at a greater distance—about sixty inches—from the lens, and at a suitable height the shadow cast on the screen is observed to be an isosceles triangle, the height of which is about half the length of its horizontal base. If the horizontal object—rod or slit—be raised the triangle breaks into two parts, an elongated base and a detached and curved inverted V. If it is lowered the triangle flattens in form and sinks into a short line.

PARADOX VI.—THE SHADOW OF A HORIZONTAL STRAIGHT LINE IS A VERTICAL STRAIGHT LINE WITH BIFID ENDS.

This effect is less easy to obtain.

In order to understand the relation between Paradox IV. and Paradox V., which were obtained with the same disposition of lens and screen, a systematic investigation was undertaken. The space between the lens and the screen was explored in a number of equidistant vertical planes. A horizontal line was laid in the plane and its shadow observed when it was raised to different heights.

Little as these paradoxical results may seem to have to do with the performance of photographic lenses, it may be at least claimed that their study helps toward the fuller understanding of the problems of lens aberrations. These singular and contradictory phenomena can only take place in beams and pencils of light which are no longer homocentric; and it is precisely this circumstance that the oblique pencil as it emerges from the lens is no longer homocentric, which gives rise to the coma and to the radial astigmatism which perturb the perfect definition toward the margins of our photographic pictures. If we understand the one set of phenomena we shall comprehend the other. The study of coma may be a matter which interests the lens-maker rather than the lens-user. To the lens-maker, and particularly to the lens-designer, a knowledge of these effects, and of their origin, is vital. They have their origin in the zonal aberrations which have occupied our attention this evening.

SILVANUS P. THOMPSON, D.Sc.

MULTIPLE COLOUR ILLUMINATION FOR PHOTO-MICROGRAPHY.

No one can work for very long at that most fascinating of photographic hobbies, photo-micrography, without discovering that there are certain beautiful and interesting objects, of which it seems well-nigh impossible to obtain a satisfactory negative. All sorts of dodges may be tried, the favourite objective from our battery of lenses employed, and still the desired result remains unobtainable. In every department of natural science, such elusive objects are to be found, to the vexation and exasperation of the photo-micrographer. Nevertheless, there is no need for the ardent student to give up the attempt to obtain a satisfactory photograph of such specimens in despair, for in nine cases out of ten it may, with a little patience and manipulative skill, be most successfully accomplished. And this is more particularly the case if the object is suitable for low or medium-power work. The difficulty is often to be overcome by the use of Rheinberg's system of multiple colour illumination; and the apparatus, which consists chiefly of coloured sheets of gelatine, can be purchased for something under half-a-crown, so it is certainly well within the reach of every photo-micrographer. The results that are to be obtained by this method of illumination are so remarkable, and frequently so helpful in deciding the exact nature of the structure of many objects, that I feel sure it only requires to be better known to become highly popular.

Rheinberg's system of multiple colour illumination for microscopy consists of a series of perfectly transparent coloured discs placed either above or below the object to be examined; and by a careful blending of these colours, it is possible to make an unstained object and its background appear of two totally different colours. Take a piece of green gelatine, and cut out a disc which will fit into the carrier used for holding the dark-ground illumination stops at the base of the substage condenser. In the centre of this green disc punch a hole one-third of its diameter in size. Now, in the centre of a clear unstained disc of gelatine, fasten a piece of blue gelatine exactly the size of the hole punched in the green disc. Place the two discs together in the carrier beneath the substage, and examine with the one-inch objective a slide of diatoms, sponge spicules or foraminifera. The sight presented to our gaze is at once surprising and beautiful, the object standing out a beautiful green colour upon a deep blue ground. Different effects may be produced at will, by varying the colours of the outer disc and central spot; the best colours being deep red, blue, purple, malachite green, and lemon yellow. Should there be no ring or carrier for stops beneath the substage condenser, the disc may be simply laid upon the surface of the condenser. Such, briefly described, is the first method of multiple colour illumination, most suitable for examining or photographing specimens with the 2 in., 1½ in. and 1 in. objectives.

Suppose a specimen, requiring a one-sixth objective to show it clearly, is to be photographed or examined, a slightly different method must be employed. An outer green disc with a red centre is placed in the stop-carrier beneath the substage condenser. On looking through the microscope the whole field will now appear quite green in colour, which is due to the wide aperture of the lens admitting a wider cone of light than that proceeding from the central red disc. The iris diaphragm beneath the substage condenser is now gradually closed until the field appears nearly white or neutral tint in colour. The best result will be obtained by using a cone of light from the condenser that will about fill two-thirds to three-quarters of the aperture of the objective. Now place a slide of polycystina or diatoms upon the stage of the microscope and examine them. They will be found to stand out in a way they have never been seen to do before, gorgeous in tints of green and red. Careful examination shows that the ridges and slightly raised portions of the objects will appear green, while the lower portions and holes in the structure are red. Now this is of vital importance, particularly if the structure of diatoms is under consideration; for it is by this means possible to instantly and unhesitatingly declare whether certain marks are perforations or small raised prominences. The third method of illumination is produced by diffraction. The thinnest cover-glasses of such a size as will conveniently cover the back lens of the one-sixth and one-eighth objectives are coated with a collodion emulsion made by dissolving Schering's celloidin in equal parts of ether and alcohol, to which the dye, previously dissolved in absolute alcohol, has been added. When the emulsion has dried, the central, or outer, portion must be carefully scratched away, according to whether a central spot or outer disc of that particular colour is required. When this has been successfully accomplished, the cover-glass is turned over, and its back coated with another coloured emulsion, which when dry may be treated in the same way; only the central or outer portion, according to which is required, being retained. By this means a series of combination discs can be readily produced. The most suitable stains for combining with the emulsion will be found to be malachite green, methyl blue, and fuchsine. Having prepared a cover-glass combination disc in the manner just described, it is very carefully dropped into the objective so as to cover the whole of the back lens. The specimen to be examined or photographed is carefully focussed, and then removed. The substage condenser must next be carefully focussed, so that on removing the eye-piece, the back lens of the objective is seen to be filled with light. With the eye-piece still away, the iris diaphragm attached to the substage condenser must be gradually closed, the manipulator looking the while down the microscope tube, until all the light is cut off from the outer portion of the disc, and only fills the central spot. The eye-piece is then inserted, and the object replaced upon the stage. If the above details have been properly carried out, a most beautiful result will have been obtained, the object standing out with almost stereoscopic brilliancy, and all details clearly and sharply defined. The three systems of multiple colour illumination above described will be found to cover a considerable range of magnification, viz., from about twenty diameters to five hundred diameters; the best results probably being obtained with magnifications about halfway between the two extremes. Those who have not the time to prepare their own discs, or who would prefer to purchase them ready made, may obtain them at a very moderate price from Messrs. R. & J. Beck, Ltd., 68, Cornhill, E.C.

A difference in the length of exposure will, of course, be found necessary when employing multiple colour illumination as an aid to photo-micrography, but one or two experimental exposures will soon set the matter right.

F. MARTIN DUNCAN.

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